I was readily able to think of the interface required and interface methods…..
I was able to determine the permutations for filling the 9 by 9 grids..

I placed dummy values in a miniBoard and populated this in the main grid 9 times.

```
int[][] miniBoard=new int [][]{{0,0,0},{0,0,0},{0,0,0}};
```

I chose Map since it seemed correct to have a unique key readily available:

```
Map <Integer, int[][]> threeByThree = new HashMap <>();
for (int k=0; k<totalMiniBoards; k++)
    {
       threeByThree.put(k, miniBoard);
    }
```

I then attempted to place the values from Map back inside a list…
But it was becoming obvious that I had little direction on how to handle this and trying to undertake too many issues…
I also had to use casting in the .add()
This was becoming an indication that there were huge problems ahead in the flow….
And furthermore I was heavily searching the internet, which suggested that I was trying techniques out of my capacity…

```
    //now need to add the threeByThree boards into nineByNine
    for (Map.Entry<Integer, int[][]> ent: threeByThree.entrySet())
    {
       lst[row][column].add((Map)ent);
```

Furthermore, even though it did add the map, I once again was trying bizarre syntax to get the List item back..

Syntax errors

```
Map <Integer,int[][]> gg = lst.get[][](0);
Map <Integer,int[][]> gg = lst.get(0)[0][0];
```

This seemed like unnecessary coding and complications from lack of planning..
Also, I tried lots of collections, but had not utilized Set, which has been the essentials for permutations and combinations….

*** CODE ***

```
 //BIG ISSUE WITH MAP IS THAT IT ALLOWS DUPLICATE VALUES!!!!

/*
/*
Online Java - IDE, Code Editor, Compiler

Online Java is a quick and easy tool that helps you to build, compile, test your programs online.
*/

//suduko challenge
//each  3 x 3   all numbers 1-9
//each row, each column must contain all numbers 1-9

// it is without replacement... but the order does matter to ensure grid is filled differently...
//P(n,r) = P(9,9) = 362880
// need do while loop while   set.size< 362800

//Now there are 9 positions for  each   3 x 3 grid
//Need to process again,  and check if   rows contain 1-9,  cols contain  1-9

//



// in the currency example,

/*

public class Main
{
   public static void main(String[] args) {
      System.out.println("Welcome to Online IDE!! Happy Coding :)");
   }
}
```

```
*/



/*
Online Java - IDE, Code Editor, Compiler
Online Java is a quick and easy tool that helps you to build, compile, test your programs online.
*/
// This has been created to ensure I can utilize any random functions more efficiently.
// It is a creation of the nPr permutation calculator.
// It has used techniques I learnt including recursion and also memoization to speed up execution.
// I will incorporate this into Java applications I created
//TEST CASES
//r=2 n=5 PASS
//r=5 n=5 PASS
//r=1 n=4 PASS
//r=0 n=3 PASS
//r=0 n=0 PASS
// now going to flip the above
//r=5 n=2 PASS
//r=5 n=5 PASS
//r=4 n=1 PASS
//r=3 n=0 PASS
//test to make numerator less than r
// n = 4 r=3 PASS
import java.math.*;
import java.util.*;

interface Fillable
{
   public void fill3x3();
   public void fill9x9();
   public boolean checkUniqueRows();
   public boolean checkUniqueColumns();
   public void place3X3Into9x9();
   public boolean SudokuComplete();
   public void get9x9Grid();
   public void get3x3Grid();

}



class Sudoku implements Fillable
{
   int numbers[] = new int[]{1,2,3,4,5,6,7,8,9};

   Random rnd = new Random();
```

```
   long permutations;

   Map <Integer, int[][]> threeByThree = new HashMap <>();



   public Sudoku(long permutations)
   {
      this.permutations =permutations;

   }

   public void fill3x3()
   {

      int[][] miniBoard=new int [][]{{0,0,0},{0,0,0},{0,0,0}};    // this will create 3 x 3 board
with all zeros
      int totalMiniBoards=9;

      //since we need 9 miniBoards, best to create them in HashMap..
      // this seems like best way to access them uniquely with a key...

      //might want to try and use streams in future for better code....

      for (int k=0; k<totalMiniBoards; k++)
      {
         threeByThree.put(k, miniBoard);
      }



   }


   public void fill9x9()
   {
      int column=0;
      int row=0;
      int gridCount=0;

      // this will contain 3 x 3 of  9 miniBoards currently in Map

      //Can you add a map in a map.
      //This will now be issue, also it will require to be 3 x 3....


      //this is just to test if possible to put a map inside....

      Map <Integer, Map> nineByNine [][]  = new HashMap[2][2];
```

```
   //now need to add the threeByThree boards into nineByNine
   for (Map.Entry<Integer, int[][]> ent: threeByThree.entrySet())
   {
      nineByNine[row][column].put(gridCount,(Map)ent);

      column++;
      gridCount++;

      //if the row is filled up, need to start a new row...
      if (column==2)
      {
         row++;    // row increased
         column=0;  //
      }


   }



         //}


   //int fullBoard[][] = new int [][] {Arrays.toInteger(miniBoard)

}

public boolean checkUniqueRows()
{
   return false;

}
public boolean checkUniqueColumns()
{
   return false;

}
public void place3X3Into9x9()
{

}
public boolean SudokuComplete()
{
   return false;

}
public void get9x9Grid()
```

```
    {

    }
    public void get3x3Grid()
    {

    }
}



public class Permutation
{
public static void main(String[] args) {
System.out.println("Welcome to Online IDE!! Happy Coding :)");
int originalNumber=9;
int n=originalNumber;
int r =9;
Map <Integer, Long> m = new HashMap<>();
System.out.println("***PERMUTATIONS***");
System.out.println("P(n,r) = n! / (n−r)!");
System.out.println("P(" + n+","+r+") = " + n+"!" + " / " + "("+n+"-"+r+")!");

Sudoku sud = new Sudoku (Permutations (n,r,originalNumber, m));


//System.out.println(Permutations (n,r,originalNumber, m));
}
public static long Permutations (int n, int r, int originalNumber, Map factorialResults)
{
// n are objects
// r is sample
/*
***CALCULATION***
P(n,r) = n! / (n−r)!
*/
long result=0;
int temp;
int denominator;
if (originalNumber<r || r<0)
{
System.out.println("please enter n ≥ r ≥ 0");
System.exit(0);
return 0;
}
if (n>=1)
{
// EXAMPLE
// P (5,6) = 5* 4 * 3 * 2 * 1 / (6-5)! = 24 / 2! = 24 / 2 * 1 = 24/2 = 12
```

```
result = (n* (Permutations (n-1, r,originalNumber, factorialResults))); // this completes factorial for numerator
factorialResults.put(n,result); //result stored in the Map
//System.out.println("getting result back out numerator " + n+": " + factorialResults.get(n));
if (n==originalNumber) // this will occur once
{
denominator = originalNumber-r; // originalNumber required since n has reduced as part of the recursive calls
//System.out.println("This is denominator: " + denominator);
// this is using the Java Memoization technique to ensure the factorial outcome is not calculated again, to save program execution cycles.
// since the returns are done in reverse order.... n = 1 is processed first and n=6 last...
//Hence in practice there will be entry in Map for all factorials, ready for the denominator..
if (factorialResults.containsKey(denominator))
{
//System.out.println("here");
//System.out.println("This is exact value of factorial denominator " + (denominator) + " : " + factorialResults.get(denominator));
return result / (long)factorialResults.get(denominator); // this is number permutations
}
}
return result; // this will be returning already calculating numerator part
}
return 1; // // it should reach here if this is false: (n>=1) }
}
}
```

I experimented further, but tried to use technique to store a hashmap into a hashmap. Once again the logic was from the purpose of maintaining unique keys and using containsKey() to initiate a search..

Once again, the coding almost compiles

I placed dummy values in a miniBoard and populated this in the main grid 9 times.

```
int[][] miniBoard=new int [][]{{0,0,0},{0,0,0},{0,0,0}};
```

I chose Map since it seemed correct to have a unique key readily available:

```
Map <Integer, int[][]> threeByThree = new HashMap <>();
for (int k=0; k<totalMiniBoards; k++)
    {
       threeByThree.put(k, miniBoard);
    }
```

I managed to add three threebyThree grids into the NinebyNine, but once again it can be seen that code is getting excessively complicated…. Again it requires casting for storing…

```
//now need to add the threeByThree boards into nineByNine
    for (Map.Entry<Integer, int[][]> ent: threeByThree.entrySet())
    {
       nineByNine[row][column].put(gridCount,(Map)ent);
```

And once again, retrieving values again from a 2D map containing another map meant that ninebyNine.get(n) would return a map… And then it has to be stored in a variable of type int[][] to be processed. This was too excessive and asking for lots of trouble.. Again it was complication affecting the readability…..

It was this point I decided to refrain from this approach, since it was an extremely difficult challenge and manipulation.

I created pseudo code as follows which vastly ensured I was on the right track…

****PSEUDO CODE**** PART 1
THIS IS PSEUDO CODE MAINLY FOCUSING ON THE FILLING OF 3 X 3 GRID

```
do {
Numbers can be generated via random. and stored in int[row][col] array   (0-2 for row and col)
to represent 3 x 3 grid.

get current set size

add int[row][col]  into the set

get new set size

continue until below condition....

}while (set.size()<P(9,9);  //


3 x 3 grids (9 total) filled into   9 x 9 grid    int[this will go from 0-8][value from  0-8]  (need to think
about this!!)
[between 0-2,  3-5,  6-8] [between 0-2,  3-5,  6-8]
//This will be the natural partitions of the set entries....
0-2
3-5
6-8

Checking at each time that the rows and columns do not contain duplicate numbers.....

Print out the grid to end user.....

// this showing that it has placed all small 9 grids inside....
} while (!gridFull)
}  end for
```

****PSEUDO CODE****PART 2
THIS IS PSEUDO CODE MAINLY FOCUSING ON THE FILLING OF 3 X 3 GRID INTO 9 X 9 AND VALIDATION REQUIRED:

I COMPLETED CODING AS BELOW FOR:
****PSEUDO CODE****PART 1

Refer to the areas in red…

```
/*
Online Java - IDE, Code Editor, Compiler
Online Java is a quick and easy tool that helps you to build, compile, test your programs online.
*/
// This has been created to ensure I can utilize any random functions more efficiently.
// It is a creation of the nPr permutation calculator.
// It has used techniques I learnt including recursion and also memoization to speed up execution.
// I will incorporate this into Java applications I created
//TEST CASES
//r=2 n=5 PASS
//r=5 n=5 PASS
//r=1 n=4 PASS
//r=0 n=3 PASS
//r=0 n=0 PASS
// now going to flip the above
//r=5 n=2 PASS
//r=5 n=5 PASS
//r=4 n=1 PASS
//r=3 n=0 PASS
//test to make numerator less than r
// n = 4 r=3 PASS

import java.math.*;
import java.util.*;
import java.util.stream.*;

interface Fillable
{
   public void fill3x3();
   public void fill9x9();
   public boolean checkUniqueRows();
   public boolean checkUniqueColumns();
   public void place3X3Into9x9();
   public boolean SudokuComplete();
```

```
    public void get9x9Grid();
    public void get3x3Grid();

}


class Sudoku implements Fillable
{

    int possibleNumbers[] = new int[]{1,2,3,4,5,6,7,8,9};
    //List<int> lst = new ArrayList<>(Arrays.asList(possibleNumbers));

    List<Integer> lst = new ArrayList<Integer>();

    long permutations;

    Integer threeBythree[][] = new Integer[3][3];    //0,0 0,1, 0,2
                               //1,0, 1,1, 1,2
                               //2,0, 2,1, 2,2
    Set <Integer[][]> s = new HashSet<>();
    int currentSize;

    List<Integer> copy = new ArrayList<>(lst);
    boolean processedDivisibleTwo=false;


    public Sudoku(long permutations)
    {
        this.permutations =permutations;

       /*
        // can also add viable numbers into list this way.
        //But I want to introduce new coding techniques so used stream....

        for (int i=0; i<possibleNumbers.length; i++)
    {
        System.out.println("fucking here");
        lst.add(possibleNumbers[i]);
    }

    */

    fill3x3();

    }

    public void fill3x3()
    {
        //PSEUDO CODE
```

```
    int row=0;
    int col=0;
    int numbersProcessed;
    int newSize;

    System.out.println("There are : " + permutations + " permutations of arranging  3 x 3 grid" );

    /*
    //ok so it has completed the full population of a single 3 x 3 grid
    since it has processed   0,0  0,1  0,2
                             1,0  1,1  1,2
                             2,0, 2,1, 2,2
    */


    do
    {
       //lst=copy;  //restore the original list;

       IntStream stream = Arrays.stream(possibleNumbers);

      // Displaying elements in Stream
      stream.forEach(str -> lst.add(str));

       //fucking mistake here
       //why reset this at start of new set entry...

       //for a new attempt to add into the set, row continues from next row
       //col=0;  //column will start again from 0 index, however it has already also done this below in modulus check
       //so best to take it out!


       numbersProcessed=0;

       System.out.println("*****This is the list size------: " + lst.size());
       System.out.println("******These are permutations completed:" + s.size());

      // this is fucking wrong loop..
      //since the loop gets smaller in size... i will process what is left!!!
      //fucking!

      //for (int i=0; i<lst.size();i++)  // this will ensure process of random selection from lst

      do
      {
         processedDivisibleTwo=false;
```

```
          System.out.println("numbers processed:" + numbersProcessed);
          Random rand = new Random();
        int randomNumber = rand.nextInt(lst.size());   //this will get 0-8, so needs addition of
1


    System.out.println("HERE!!!!");
    System.out.println(row);
    System.out.println(col);

    threeBythree[row][col]= lst.get(randomNumber);
    System.out.println("Following number added into the 3 x 3 grid: " + randomNumber);
    lst.remove(randomNumber);

    System.out.println("This is new list size: " + lst.size());

    if (col%2==0 && col!=0)    // at this point it has populated row of 3 x 3 grid...
    {
       System.out.println("divisible");
       row++;  //it has to start a new row
       col=0;  //the column is reset back to 0
       processedDivisibleTwo = true;
    }

    if (!processedDivisibleTwo)   // it will only do this condition if it hasn't already been reset
to 0 as part of new column above...
    {
    col++;  //otherwise it will increase the column in the given row by 1 until above
condition is met...
    System.out.println("new column: " + col);
    }

    numbersProcessed++;
      }while(!lst.isEmpty());

     currentSize=s.size();
     System.out.println("This is the current set size: " + currentSize);

    s.add(threeBythree);

    newSize=s.size();
    System.out.println("This is the new set size: " + newSize);

    get3x3Grid();

    row=0;     // the process starts again..
    col=0;  // the process starts again..
```

}while (s.size()<permutations);

/*
numbers can be generated via random. and stored in int[row][col] array (0-2 for rows and col)
get current set size
add int[row][col] into the set
get new set size
continue until below condition....
}while (set.size()<P(9,9); // can not do this... since these are permutations if sudoku not met...
// but at same time, it has to explore every single one.....

3 x 3 grids (9 total) filled into 9 x 9 grid int[this will go from 0-8][value from 0-8] (need to think about this!!)
[between 0-2, 3-5, 6-8] [between 0-2, 3-5, 6-8]

//This will be the natural partitions of the set entries....
0-2
3-5
6-8

Checking at each time that the rows and columns do not contain duplicate numbers.....

Print out the grid to end user.....

// this showing that it has placed all small 9 grids inside....
} while (!gridFull)
} end for

*/

}

public void fill9x9()
{

}

public boolean checkUniqueRows()
{

```
        return false;

    }
    public boolean checkUniqueColumns()
    {
        return false;

    }
    public void place3X3Into9x9()
    {

    }
    public boolean SudokuComplete()
    {
        return false;

    }

    public void get9x9Grid()
    {

    }

    //for some fucking reason, the set is not getting bigger..

    public void get3x3Grid()
    {
        System.out.println("***********");

        // since set has got an  int[][] it will need a nested solution to get value back
        // for each row, go through all the columns.....

        // this is just to test that it can reach the grid correctly,
        // this is easiest route to allow it traverse the set....


        // can imagine this being huge problem in future.
        //since there is no get by index.....
        // this will potential mean the amount of screen output will be very limited..
        // since it will have show entirety!!!
        //very similar to StringTokenizer!!!! and no point taking content and storing
elsewhere...
        //Perhaps it can be added into Map at future point only once its fully populated with all
permutations...
        // This will then allow it to use the containskey method...

        for (Integer[][] t: s)   //for each integer array in the set
        {
            Integer [][] grid =  t;          // this is the grid
```

```
System.out.println("*******What is in the grid: " + t);

        //this will be extremely code expensive as the set grows...
        //But for now, it is being done just to understand what is actually being stored in
set.


           for (Integer g[]: grid)
           {
              System.out.println(Arrays.toString(g));
           }


       /*
        for (int j=0; j<grid.length; j++)
         //this will tell you number columns in the row
        {
            //this will tell you number columns ... always gets confusing which way round
           for (int i=0; i<grid[0].length; i++)
           {
              //need all values on the same line here....
              System.out.println("Number here: " + grid[j][i]);

           }
        }
        */

  }

        //System.out.println(t[0][0]);
        //System.out.println(t[0][1]);
     }
  }
```

***** OUTCOME ******

It can be seen below, there is a massive improvement to my objectives.

But I hit an issue, see red.

Note: Permutation.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.
Welcome to Online IDE!! Happy Coding :)
PERMUTATIONS
P(n,r) = n! / (n−r)!
P(9,9) = 9! / (9-9)!
There are : 362880 permutations of arranging 3 x 3 grid //This is correct
*******This is the list size------: 9 //This is correct**
******These are permutations completed:0
numbers processed:0
HERE!!!!
0 //This is correct, its first location row and col to use to store value
0 // This is correct, its first location row and col to use to store value
Following number added into the 3 x 3 grid: 4 // This is correct
This is new list size: 8 // This is correct
new column: 1
numbers processed:1
HERE!!!!
0 //This is correct, this is the next location [row][col]
1 //
Following number added into the 3 x 3 grid: 5
This is new list size: 7
new column: 2
numbers processed:2
HERE!!!!
0
2
Following number added into the 3 x 3 grid: 8
This is new list size: 6
divisible
numbers processed:3
HERE!!!!
1
0
Following number added into the 3 x 3 grid: 7
This is new list size: 5
new column: 1
numbers processed:4
HERE!!!!
1
1
Following number added into the 3 x 3 grid: 9

This is new list size: 4
new column: 2
numbers processed:5
HERE!!!!
1
2
Following number added into the 3 x 3 grid: 6
This is new list size: 3
divisible
numbers processed:6
HERE!!!!
2
0
Following number added into the 3 x 3 grid: 3
This is new list size: 2
new column: 1
numbers processed:7
HERE!!!!
2
1
Following number added into the 3 x 3 grid: 2
This is new list size: 1
new column: 2
numbers processed:8
HERE!!!!
2 //**This is correct, this is last [row][col]**
2
Following number added into the 3 x 3 grid: 1
This is new list size: 0
divisible
This is the current set size: 0 //**This is correct, the set size has grown as expected….**
This is the new set size: 1 //**This is correct, the set size has grown as expected….**

****
*******What is in the grid: [[Ljava.lang.Integer;@546a03af **// This is correct since it is simply printing out variable grid of type Int[][]**
[4, 5, 8] **//This is correct, it can be seen a unique 3 x 3 grid….**
[7, 9, 6]
[3, 2, 1]
*****This is the list size------: 9** **// this is correct, since the list re-instated…**
******These are permutations completed:1** **// this is correct, its based on set size…**
numbers processed:0
HERE!!!!
0
0
Following number added into the 3 x 3 grid: 8
This is new list size: 8
new column: 1
numbers processed:1
HERE!!!!
0
1
Following number added into the 3 x 3 grid: 7
This is new list size: 7

new column: 2
numbers processed:2
HERE!!!!
0
2
Following number added into the 3 x 3 grid: 9
This is new list size: 6
divisible
numbers processed:3
HERE!!!!
1
0
Following number added into the 3 x 3 grid: 1
This is new list size: 5
new column: 1
numbers processed:4
HERE!!!!
1
1
Following number added into the 3 x 3 grid: 2
This is new list size: 4
new column: 2
numbers processed:5
HERE!!!!
1
2
Following number added into the 3 x 3 grid: 3
This is new list size: 3
divisible
numbers processed:6
HERE!!!!
2
0
Following number added into the 3 x 3 grid: 4
This is new list size: 2
new column: 1
numbers processed:7
HERE!!!!
2
1
Following number added into the 3 x 3 grid: 6
This is new list size: 1
new column: 2
numbers processed:8
HERE!!!!
2
2
Following number added into the 3 x 3 grid: 5
This is new list size: 0
divisible
This is the current set size: 1 **// This is correct**
This is the new set size: 1 **//This is incorrect….**
****

*******What is in the grid: [[Ljava.lang.Integer;@546a03af
//also this value is exactly the same as getting variable for previous int[][] even though the grid below is different..
I had to conduct research online, and it mentioned same issue to be expected with primitive data type arrays…
This created a massive problem, so I had to change the direction of my code…

[8, 7, 9]
[1, 2, 3]
[4, 6, 5]
*****This is the list size------: 9

I adjusted my software now to add String into the Set… The values now started to increment….

This of course created an issue since displaying the grid would require manipulation to show grid to screen.
So I introduced lots of flexibility of storing information as follows:

//content is stored in three locations.....
//**** SO FAR *****
//The data is stored in following places:
1) in set data type: String of all 9 unique numbers…
2) HashMap data type: int[][].. Information is added here with same information as set..

I have also preserved this in my final code, so in future, if there is a change in a better way, it can be processed. But it has been commented out.
(SEE END DOCUMENT).
But I struggled massively… These comments will remain on top of my final code…..
I also chose to tried copy the map values into List and and Set to no avail……

I was now in a position to break down the problem at a more user level. Reason for trying to understand this is since I computed P(9,9) and this was 362 800.
There is now also 9 ways again of laying out 362 800 unique permutations..
This number was staggering, and would break the computation…

Permutation and Combination Calculator

Total Amount in a Set (n): 362800
Amount in each Sub-Set (r): 9
Calculate | Clear

Result

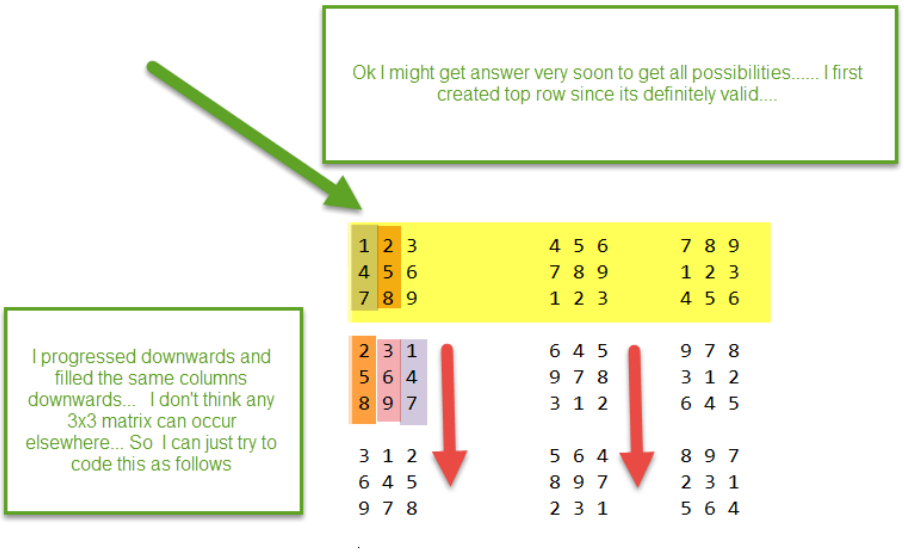
Permutations, ${}_nP_r = \frac{362800!}{(362800 - 9)!}$

=
108,883,584,818,776,183,656,945,007,213,012,309,135,068,193,536,000

Combinations, ${}_nC_r = \frac{362800!}{9! \times (362800 - 9)!}$

=
300,053,970,510,295,920,571,387,255,326,863,726,672,917,200

I tried to analyse if there is a pattern of transposing the columns from unique top row (as below) into the next two rows..
A pattern arose, but I was just not confident in doing this granular analysis… Especially if my theory was all wrong… And although it can be visually seen from mindset, putting this logic across into code is prone to error…
So, I intend to stick wth my pseudo code for now..



Reason why my pseudo code approach is better is since it supports manually filling out each grid 9x9 position with a value from 3x3 matrix.. This will support in future if I wish to check if Suduko challenges (partially completed) can be solved. This will be using Java to demonstrate a real world issue..

At moment, I have successfully validated that it is adding permutations into the set:
See code in red which defines the limit….
But whilst this is a huge number, I had to reduce this set size so that I can complete my code and not wait for this to finish.
More importantly, it was important to see if the code can produce this many permutations in one sitting without memory issues..
So I severely reduced my System.out.println() comments…
And the code is as below in red (changing permutations value if required).

****** OUTPUT *******

```
This is the new set size: 38436   9,5,6,8,4,1,7,2,3
This is the new set size: 38437   9,1,5,4,6,7,3,2,8
This is the new set size: 38438   6,8,5,1,3,7,9,2,4
This is the new set size: 38439   8,2,1,7,3,6,9,4,5
This is the new set size: 38440   8,2,6,5,7,4,1,9,3
This is the new set size: 38441   9,3,2,8,7,6,1,5,4
This is the new set size: 38442   9,2,1,7,8,4,5,6,3
This is the new set size: 38443   8,7,5,2,3,9,1,4,6
This is the new set size: 38444   8,6,3,9,5,1,4,7,2
This is the new set size: 38445   3,2,5,9,7,1,8,4,6


Output Size exceeded 2MB. Process Killed.
```

Unfortunately with online-Java, it terminated too early..

So I tried another online Java IDE:
And reached this, but in past it reached over 300,000
https://www.onlinegdb.com/online_java_compiler#

```
This is the new set size: 111342   3,2,8,9,7,6,1,4,5
This is the new set size: 111343   2,4,9,1,7,5,8,6,3
This is the new set size: 111344   3,7,2,8,6,4,9,1,5
This is the new set size: 111344   1,6,8,5,3,4,2,7,9
This is the new set size: 111344   4,2,1,8,3,9,6,5,7
This is the new set size: 111345   3,8,4,9,1,2,5,6,7
This is theKilled
```

I had to think about the issue a bit and realise will a similar instance occur in the software? Most likely not since screen outputs reduced as application grows.

I developed further pseudocode on how code will process and actually check to see if sudoku is valid.. Unfortunately it became complicated, but something I am prepared to manipulate in my code…

**********PSEUDO CODE **********
//need to work out what to do if 3x3 grid is invalid in 9x9 (this is achieved by running checking unique rows and unique columns)…

ensure copy of the existing set..... (done,
Set<String> s = new HashSet();
Set<String> copyPermuations = new HashSet(s);

select 1st 3x3 grid.. (also made a clone, so that it can be identified next time temp[][] has been copied onto first3x3GridSelected[][]

Populate it into 9x9 grid first (done, temp has been populated into 9x9 grid….)
//also made a copy of the first temp[0][0] onto first3x3GridSelected[][]

remove it from the Set with permutations.... (is it doing this already?)
The current set with permutations is stored in:
String[] perm3x3 = s.toArray(new String[s.size()]);
first3x3StringPlacedInGrid=perm3x3[0];
It needs to perform s.remove(first3x3StringPlacedInGrid);

If all successful, it would restore the copied grid back onto the original one…..

VIOLATING GRID

// it needs to prevent this 3x3 to be selected again in this position (if it violated with first grid), until the numComplete9x9Boards has incremented.
It also has to keep colIndex and rowIndex and put this back….

GRID OK

//if its ok...(not getting any success with a large set, but process is to remove each grid from s.remove( ) once it has been added..

(this can only be finalised right when numbersProcessed3x3 =9)
remove this 3x3 from the set....
When numComplete9x9Boards increases, restore copied set back as original.
The board that was in column offset 0 [0,0] of 9x9 has to stay there
until it has exhausted all permutations of 3x3 grids around it...

//**********

//reaches 301962 with one line system.out.println
// TOTAL: 362880
/*
Online Java - IDE, Code Editor, Compiler
Online Java is a quick and easy tool that helps you to build, compile, test your programs online.
*/

```
// This has been created to ensure I can utilize any random functions more efficiently.
// It is a creation of the nPr permutation calculator.
// It has used techniques I learnt including recursion and also memoization to speed up
execution.
// I will incorporate this into Java applications I created
//TEST CASES
//r=2 n=5 PASS
//r=5 n=5 PASS
//r=1 n=4 PASS
//r=0 n=3 PASS
//r=0 n=0 PASS
// now going to flip the above
//r=5 n=2 PASS
//r=5 n=5 PASS
//r=4 n=1 PASS
//r=3 n=0 PASS
//test to make numerator less than r
// n = 4 r=3 PASS

import java.math.*;
import java.util.*;
import java.util.stream.*;

interface Fillable
{
   public void fill3x3();
   public void fill9x9();
   public boolean checkUniqueRows();
   public boolean checkUniqueColumns();
   public void place3X3Into9x9();
   public boolean SudokuComplete();
   public void get9x9Grid();
   public void get3x3Grid();

}


class Sudoku implements Fillable
{

   int possibleNumbers[] = new int[]{1,2,3,4,5,6,7,8,9};
   //List<int> lst = new ArrayList<>(Arrays.asList(possibleNumbers));

   List<Integer> lst = new ArrayList<Integer>();

   long permutations;

   int threeBythree[][] = new int[3][3];    //0,0 0,1, 0,2
                                 //1,0, 1,1, 1,2
```

```
                                    //2,0, 2,1, 2,2
  //Set <Integer[][]> s = new HashSet<>();

  Set<String> s = new HashSet();
  Map<Integer, int[][]> mp = new HashMap();

  int currentSize;
  int newSize;
  int[][] miniGrid;

  List<Integer> copy = new ArrayList<>(lst);
  boolean processedDivisibleTwo=false;


  public Sudoku(long permutations)
  {
     this.permutations =permutations;

    /*
     // can also add viable numbers into list this way.
     //But I want to introduce new coding techniques so used stream....

     for (int i=0; i<possibleNumbers.length; i++)
  {
     System.out.println("fucking here");
     lst.add(possibleNumbers[i]);
  }

  */

  fill3x3();

  }

  public void fill3x3()
  {
     //PSEUDO CODE

    //might be worth using stream in future

    int row=0;
    int col=0;
    int numbersProcessed;

    StringJoiner sj = new StringJoiner(",");

    System.out.println("There are : " + permutations + " permutations of arranging  3 x 3
grid" );
```

```
    /*
    //ok so it has completed the full population of a single 3 x 3 grid
    since it has processed   0,0  0,1  0,2
                             1,0  1,1  1,2
                             2,0, 2,1, 2,2
    */


    do
    {
       //lst=copy;  //restore the original list;

       IntStream stream = Arrays.stream(possibleNumbers);

      // Displaying elements in Stream
      stream.forEach(str -> lst.add(str));

       //fucking mistake here
       //why reset this at start of new set entry...

       //for a new attempt to add into the set, row continues from next row
       //col=0;  //column will start again from 0 index, however it has already also done this
below in modulus check
       //so best to take it out!


       numbersProcessed=0;

       //System.out.println("*****This is the list size------: " + lst.size());
       //System.out.println("******These are permutations completed:" + s.size());

      // this is fucking wrong loop..
      //since the loop gets smaller in size... i will process what is left!!!
      //fucking!

      //for (int i=0; i<lst.size();i++)  // this will ensure process of random selection from lst

      do
      {
         processedDivisibleTwo=false;

         //System.out.println("numbers processed:" + numbersProcessed);
         Random rand = new Random();
        int randomNumber = rand.nextInt(lst.size());   //this will get 0-8, so needs addition of
1

    //System.out.println("HERE!!!!");
    //System.out.println(row);
    //System.out.println(col);
```

```
    threeBythree[row][col]= lst.get(randomNumber);

    // since set has failed to work with List<String>, Int[][], Integer[][], String[][]
    //it has proven to work with String....
    //so all the numbers will be concatenated to a String
    //it might be sensible potentially to complete stringjoiner with ,
    //StringTokenizer can be used to perform retrieval....

    sj.add(Integer.toString(lst.get(randomNumber)));
    //sudokuMiniGrid = sudokuMiniGrid + Integer.toString(lst.get(randomNumber));

    //System.out.println("Following number added into the 3 x 3 grid: " + randomNumber);
    lst.remove(randomNumber);

    //System.out.println("This is new list size: " + lst.size());

    if (col%2==0 && col!=0)    // at this point it has populated row of 3 x 3 grid...
    {
       //System.out.println("divisible");
       row++;  //it has to start a new row
       col=0;  //the column is reset back to 0
       processedDivisibleTwo = true;
    }

    if (!processedDivisibleTwo)   // it will only do this condition if it hasn't already been reset
to 0 as part of new column above...
    {
    col++;  //otherwise it will increase the column in the given row by 1 until above
condition is met...
    //System.out.println("new column: " + col);
    }

    numbersProcessed++;
      }while(!lst.isEmpty());

    currentSize=s.size();
    //System.out.println("This is the current set size: " + currentSize);

    //s.add(Arrays.asList(threeBythree[0][0].toString()));
    s.add(sj.toString());



    //System.out.println("************This is the first row into String: " + sj.toString());



    newSize=s.size();
    System.out.println("This is the new set size: " + newSize + "   " + sj.toString());
```

```
     sj=new StringJoiner(",");

    //this will put the matrix version of 3 x 3 if permutation is unique....
    if (newSize>currentSize)
    {
       mp.put(newSize,threeBythree);
    }

    get3x3Grid();

    row=0;     // the process starts again..
    col=0;  // the process starts again..

    }while (s.size()<permutations);

/*
numbers can be generated via random. and stored in int[row][col] array   (0-2 for rows and
col)
get current set size
add int[row][col]  into the set
get new set size
continue until below condition....
}while (set.size()<P(9,9);  // can not do this... since these are permutations if sudoku not
met...
// but at same time, it has to explore every single one.....


3 x 3 grids (9 total) filled into   9 x 9 grid    int[this will go from 0-8][value from  0-8]  (need to
think about this!!)
                                                        [between 0-2,  3-5,  6-8] [between 0-2,  3-5,  6-
8]

//This will be the natural partitions of the set entries....
0-2
3-5
6-8

Checking at each time that the rows and columns do not contain duplicate numbers.....

Print out the grid to end user.....

// this showing that it has placed all small 9 grids inside....
} while (!gridFull)
}  end for

*/
   }
```

```
public void fill9x9()
{

}

public boolean checkUniqueRows()
{
   return false;

}
public boolean checkUniqueColumns()
{
   return false;

}
public void place3X3Into9x9()
{

}
public boolean SudokuComplete()
{
   return false;

}

public void get9x9Grid()
{

}

//for some fucking reason, the set is not getting bigger..

public void get3x3Grid()
{
   //System.out.println("***********");

   if (mp.containsKey(newSize))
   {
      miniGrid = mp.get(newSize);
   }

   //System.out.println("This should be same in map:");
   for (int[] g :miniGrid)
   {
      //System.out.println(Arrays.toString(g));
   }


   // since set has got an  int[][] it will need a nested solution to get value back
```

```
// for each row, go through all the columns.....

// this is just to test that it can reach the grid correctly,
// this is easiest route to allow it traverse the set....


// can imagine this being huge problem in future.
//since there is no get by index.....
// this will potential mean the amount of screen output will be very limited..
// since it will have show entirety!!!
//very similar to StringTokenizer!!!! and no point taking content and storing elsewhere...
//Perhaps it can be added into Map at future point only once its fully populated with all permutations...
// This will then allow it to use the containskey method...

/*
for (int i=0; i<s.size(); i++)
{
   System.out.println(s.get(i));
}
*/

/*
for (List<String> t: s)   //for each integer array in the set
{
   String grid =  t.get();           // this is the grid
   System.out.println(grid);

   //this will be extremely code expensive as the set grows...
   //But for now, it is being done just to understand what is actually being stored in set.

  /*
    for (Integer g[]: grid)
    {
       System.out.println(Arrays.toString(g));
    }
  */

  /*
   for (int j=0; j<grid.length; j++)
    //this will tell you number columns in the row
   {
       //this will tell you number columns ... always gets confusing which way round
      for (int i=0; i<grid[0].length; i++)
      {
         //need all values on the same line here....
         System.out.println("Number here: " + grid[j][i]);
```

```
            }
        }
        */

    }
}


        //System.out.println(t[0][0]);
        //System.out.println(t[0][1]);


public class Permutation
{
public static void main(String[] args) {
System.out.println("Welcome to Online IDE!! Happy Coding :)");
int originalNumber=9;
int n=originalNumber;
int r =9;
Map <Integer, Long> m = new HashMap<>();
System.out.println("***PERMUTATIONS***");
System.out.println("P(n,r) = n! / (n−r)!");
System.out.println("P(" + n+","+r+") = " + n+"!" + " / " + "("+n+"-"+r+")!");

Sudoku sud = new Sudoku (Permutations (n,r,originalNumber, m));


//System.out.println(Permutations (n,r,originalNumber, m));
}
public static long Permutations (int n, int r, int originalNumber, Map factorialResults)
{
// n are objects
// r is sample
/*
***CALCULATION***
P(n,r) = n! / (n−r)!
*/
long result=0;
int temp;
int denominator;
if (originalNumber<r || r<0)
{
System.out.println("please enter n ≥ r ≥ 0");
System.exit(0);
return 0;
}
if (n>=1)
{
// EXAMPLE
```

```
// P (5,6) = 5* 4 * 3 * 2 * 1 / (6-5)! = 24 / 2! = 24 / 2 * 1 = 24/2 = 12
result = (n* (Permutations (n-1, r,originalNumber, factorialResults))); // this completes factorial for numerator
factorialResults.put(n,result); //result stored in the Map
//System.out.println("getting result back out numerator " + n+": " + factorialResults.get(n));
if (n==originalNumber) // this will occur once
{
denominator = originalNumber-r; // originalNumber required since n has reduced as part of the recursive calls
//System.out.println("This is denominator: " + denominator);
// this is using the Java Memoization technique to ensure the factorial outcome is not calculated again, to save program execution cycles.
// since the returns are done in reverse order.... n = 1 is processed first and n=6 last...
//Hence in practice there will be entry in Map for all factorials, ready for the denominator..
if (factorialResults.containsKey(denominator))
{
//System.out.println("here");
//System.out.println("This is exact value of factorial denominator " + (denominator) + " : " + factorialResults.get(denominator));
return result / (long)factorialResults.get(denominator); // this is number permutations
}
}
return result; // this will be returning already calculating numerator part
}
return 1; // // it should reach here if this is false: (n>=1) }
}
}
```

I have reached a major milestone.
I have got software to generate nine 3x3 grids (generated randomly) and fill them number by number (from left to right) row by row..
This has been extremely challenging... It has also showed how many times the number has appeared in each row and in each column.
Although this is not the solution to problem... It is part of the bigger picture...
It shows all relevant comments on the screen to understand exactly what is going on...
It also tells end user if its a suduko valid grid...
But it hasn't shown if grid is valid..
I thought it would be simple with following method (fill3x3Manual) instead of fill3x3.
But several issues occurred in methods in red…
So I was in no position to test for a valid board…..

```
public void fill3x3Manual()
   {
      //This is the new set size: 1   1,7,6,3,5,2,4,8,9
      //FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
      //[1, 7, 6]
      //[3, 5, 2]
      //[4, 8, 9]
```

```
//We know the above is accepted string format for the numbers in the 3x3 grid....
//I will populate some grids into the set in a similar way...
//It will be nine  3x3  squares that will get Sudoku
//I will also at some point try to experiment with order of these.... to try and get a fully working solution...
// once I can apply this knowledge here, it will be transferrable to the bigger solution...
// there is also less clutter here....
//also I can try and pushing this until it hits  P(9,9)
// But will need to switch off several system.out.println()!!!!!

/*
1 2 3   4 5 6   7 8 9
4 5 6   7 8 9   1 2 3
7 8 9   1 2 3   4 5 6

2 3 1  6 4 5   9 7 8
5 6 4  9 7 8   3 1 2
8 9 7  3 1 2   6 4 5

3 1 2  5 6 4   8 9 7
6 4 5  8 9 7   2 3 1
9 7 8  2 3 1   5 6 4
*/


s.add("1,2,3,4,5,6,7,8,9");
s.add("4,5,6,7,8,9,1,2,3");
s.add("7,8,9,1,2,3,4,5,6");
s.add("2,3,1,5,6,4,8,9,7");
s.add("6,4,5,9,7,8,3,1,2");
s.add("9,7,8,3,1,2,6,4,5");
s.add("3,1,2,6,4,5,9,7,8");
s.add("5,6,4,8,9,7,2,3,1");
s.add("8,9,7,2,3,1,5,6,4");


 //get3x3Grid();  can not do this....
//fill9x9(mp);  // having issue running this.... even tried taking off references to mp...
//get9x9Grid();  //will also
```

I think this is next important phase…
Before I start exploring all permutations out there…
Given a set size of approximately 100,00 and selecting nine 3x3 randomly each time, I expect one to be valid quite soon…

Having looked at this exercise, I believe I have handled it incorrect….
I should have tried to answer the question in hand but I felt it needed all permutations first…

Perhaps I should have just tried to use a partially filled grid… and stuck pseudo code as follows:

**** PSEUDO CODE ****
Tried to add a number into 3x3 grid…. (assuming it was not already there).
See if it passes condition for uniquerow and unique column…
And just keep doing the process until rows and cols add up to 45…

It is proving to be a bit too impossible to apply logic to generate all permutations inline with my previous pseudo code… Also since I have not found a way to manually input 3x3 grids, I have to sit and wait for a valid grid to populate.
Also I am finding that even when selecting 9 random 3x3 samples, from a massive n objects..
It still isn't finding any working solutions….

I do not think it was a waste of time, perhaps a case of trying to design something that was not required…
Also I realised the manner in which I filled the 9x9 grid was in most complex way possible…
But it managed to get the process complete…..

It has been a very excellent learning curve in using lots of different techniques in Java.
And I was coding with purpose, but trying reach objectives in a reverse engineered manner..

I also think using the interface style approach had benefits, but it appears it also made my code much longer..
On other hand, I see lots flexible areas….

The code is here. And whilst it is much tidied up, I will try to visit the fill3x3manual to get a positive outcome..:

********** OUTPUT **********

Note: Permutation.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.
Welcome to Online IDE!! Happy Coding :)
PERMUTATIONS
P(n,r) = n! / (n−r)!
P(9,9) = 9! / (9-9)!
There are : 362880 permutations of arranging 3 x 3 grid
There are : 108,883,584,818,776,183,656,945,007,213,012,309,135,068,193,536,000 permutations of arranging 3 x 3 grid into 9 x 9:P(362880,9)
There are : 6,670,903,752,021,072,936,960 permutations of completing sudoku
This code will attempt to explore but its impossible to expect much
It is used for foundation of experimentation but also it has made serious attempt to complete random process to make a grid
I am removing excess code so it is ready future development.

******These are permutations completed:0
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 0
This is the new set size: 1   Added: 8,3,2,4,1,5,9,7,6
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[8, 3, 2]
[4, 1, 5]
[9, 7, 6]

******These are permutations completed:1
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 1
This is the new set size: 2   Added: 5 6 1 3 4 7 9 8 2
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[5, 6, 1]

[3, 4, 7]
[9, 8, 2]

******These are permutations completed:2
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 2
This is the new set size: 3 Added: 1 2 6 9 8 3 4 7 5
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[1, 2, 6]
[9, 8, 3]
[4, 7, 5]

******These are permutations completed:3
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 3
This is the new set size: 4 Added: 4 2 8 6 1 3 5 7 9
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[4, 2, 8]
[6, 1, 3]
[5, 7, 9]

******These are permutations completed:4
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 4
This is the new set size: 5 Added: 7 4 2 3 5 1 6 9 8

FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[7, 4, 2]
[3, 5, 1]
[6, 9, 8]

******These are permutations completed:5
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 5
This is the new set size: 6 Added: 9 7 4 2 1 6 3 5 8
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[9, 7, 4]
[2, 1, 6]
[3, 5, 8]

******These are permutations completed:6
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 6
This is the new set size: 7 Added: 7 3 5 4 6 2 1 8 9
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[7, 3, 5]
[4, 6, 2]
[1, 8, 9]

******These are permutations completed:7
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0

This is the current set size: 7
This is the new set size: 8 Added: 2 3 6 4 1 5 9 7 8
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[2, 3, 6]
[4, 1, 5]
[9, 7, 8]

ALL WAY UP TO 4,270…

******These are permutations completed:4719
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 4719
This is the new set size: 4720 Added: 3 7 2 1 5 9 4 8 6
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[3, 7, 2]
[1, 5, 9]
[4, 8, 6]

******These are permutations completed:4720
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4

THIS IS CONSIDERED TOO SMALL.
SO ALL SCREEN OUTPUTS TURNED OFF….
EXCEPT…

System.out.println("\n\nBetter luck next time, failed on board: " + count);

System.out.println("Congratulations, sudoku complete on board: " + count);

**** CODE (ALL COMMENTS). **********

```
/*
Online Java - IDE, Code Editor, Compiler
Online Java is a quick and easy tool that helps you to build, compile, test your programs online.
*/
// This has been created to ensure I can utilize any random functions more efficiently.
// It is a creation of the nPr permutation calculator.
// It has used techniques I learnt including recursion and also memoization to speed up execution.
// I will incorporate this into Java applications I created

//TEST CASES
//Difficult to produce..


// With lots trying, there is a major issue in trying to get the numbers back out of an int[][] that
// have been stored in list (copied from Map).
//For some reason, it is able to show values in Map.get (using the key which is simply the pos of 3x3 grid in it).
//I can process all int[] in the value, and see them as Array list...

//I have tried everything in my capacity to make these numbers visible, but it has not worked:
//This includes adding the miniGrid to a 3D array and processing...
//running nested loop to get each number from array and storing in another 2D array.
//simply running  System.out.println miniGrid[0][0]  up to [2][2],  but the output is non-consistent
//with what is being stored...
```

// I have also included commented code (for loop initialisation) and also setting temp based on this, but
//its irrelevant given above situation...

//Complete forgot to set temp = mp.get(i)!!!!
//Need to try this first..... (THIS HAS ALSO FAILED!!!!!)

// The only left technique is using the Set<String> s = new HashSet() since the String of unique permutation
//was written here at the time that a unique permutation acquired.

//It will be attempted to extract the numbers from the String using String Tokenizer. Cast them to Int....
//This will then be added into a int [][] and stored into temp, and it will try fill9x9grid again....
//This will preserve my hard coded logic of rowIndex, colIndex, colCount, rowCount.....
// THIS HAS WORKED....

//also didn't need three if statements for setting offset...
// could have used if totalNumbersProcessed = 0 (offset0) , 9 (offset3), 18(ofset 6), 27 (offset 0), 24, 43,51, 60, 69, 76,83,90

// FINISHED - FILLING GRID.. GIVING SCREEN OUTPUT OF NUMBER TIMES NUMBER HAS APPEARED...

//I HAVE NOT USED TOKENIZER, ALTHOUGH THIS WAS OPTION...
//SINCE THE , SEPARATED THE VALUES IN 3x3 GRID, I SIMPLY DID INCREMENT i=i+2
//TO MAKE CODE MORE PROFESSIONAL, THIS CAN BE ADDRESSED IN THE FUTURE....

//**** NOT REQUIRED ***
//if it fails, only option is to change the fill9x9 grid to execute via String.charAt()..... So logic change will
//be required of the code.....
//colIndex and rowIndex will remain.....
// colCount and rowCount will be affected since 3x3 grids no longer on [3][3], but logic can be twisted!

//*** UP TO HERE ***
//NOW NEED TO CHECK BEST POINT TO CHECK FOR UNIQUE ROWS AND UNIQUE COLUMNS....
//EASIEST WAY IS TO CHECK BY DUPLICATION OF A NUMBER IN EACH DIRECTION...
//I CAN THEN FOLLOW MY PSEUDO CODE AS PLANNED TO POPULATE THE GRID!!!!!!
//JUST FUCKING HOPE THE BOARDS ARE BEING STORED CORRECTLY WHEN FINISHED/
//OTHERWISE WILL NEED TO IMPLEMENT A METHOD TO FORMAT THE 81 NUMBERS PROPERLY

```
//IT SHOULDNT BE TOO DIFFICULT SINCE THE BOARD SUMMARY HAS VALUE AND ALSO CO-ORDINATES... SO JUST PLACE THEM BACK

//IT FILLED 9x9,


//how to process rowcheck
//use switch
//case totalNumbersProcessed =9

//how to process column check

import java.math.*;   //KEEP
import java.util.*;        //KEEP
import java.util.stream.*;   //KEEP

interface Fillable   //KEEP
{  //KEEP
   public void fill3x3Manual();  //KEEP: Method failed. Tried to populate list manually with strings to see if a solution can be reached..
   public void fill3x3();  //KEEP:  method to fill 3x3 grids...
   public void fill9x9(Map<Integer, int[][]> mp);  // KEEP: fills the full board...
   public boolean checkUniqueRows(int [][] temp, int rowIndex);  //checks if row is unique..
   public boolean checkUniqueColumns(int[][] nineByNine, int colIndex); //checks if column is unique..
   public boolean sudokuComplete(boolean a, boolean b);  //checks if valid grid based on the above...
   public void get9x9Grid();  //experimental, trying to recover information from collections, but fails....
   public void get3x3Grid();   //largely experimental, but it also has loop to show rows of two dimensional matrix of
   public void wipe9x9Board(int[][] formattedBoard, int[][] nineByNine);  //wipes board, formattedBoard(derived from strings to ints) and ninebynine getting values from temp array.
   public void print9x9Board(String history, int numComplete9x9Boards); //keeps log of all completedBoards
   public int convertStringTo3x3(String permutations3x3, int getNumString); //it takes string from set of permutations and puts it into a int[3][3] array
   public void realTime9x9Fill(String history);  // this shows how the grid is filling and impact on numbers in row and col
   public void display9x9(); // this will show the 9x9 onto the screen.....

}

class nineByNine
{

   int test;
```

```
   public nineByNine()
   {
      //initial state nineByNine grid

         //int nineByNineCopy[][] = nineByNine.clone();
         // I intened to use this so that it can be restored again once board is complete..
         // but had issues and it never seemed to work...
         //so just manually set 0's back in.....
   }
}

class Sudoku implements Fillable
{
   Map<Integer, int[][]> mp = new HashMap();  //this will hold all the indexes....

   int possibleNumbers[] = new int[]{1,2,3,4,5,6,7,8,9};  //all possible numbers

   List<Integer> lst = new ArrayList<Integer>();  // list will be used to hold all numbers above
for selection...

   int MiniTest[][] = new int[3][3];  //used for testing, storing values....
   int formattedBoard[][] = new int [9][9];   // this will hold numbers retrieved from string of
board summary...

  Map<Integer, int[][]> completedBoards = new HashMap<>();  //All completed boards
stored here...
  int numComplete9x9Boards=1;   //number completed 9x9 boards....

  StringJoiner sj1 = new StringJoiner(",");  // initialised first time.....
  //This will be used to get values from formattedBoard row by row...
  //It is used for screenoutput of the entire 9x9 structure....


 // I was thinking about introducing new nineByNine class, but couldn't see real purpose..
 // This would be ideal if I did evenutally moved onto area of testing partially filled 9 by 9
grid
 // to keep logic separate..

//nineByNine [] nbn = new nineByNine[5000]; // is it best way to create an array on
nineByNine classes...
//nbn[0]= new nineByNine();


   int [][] nineByNine = new int[][]{     {0,0,0,0,0,0,0,0,0},
                                    {0,0,0,0,0,0,0,0,0},
                                    {0,0,0,0,0,0,0,0,0},
                                    {0,0,0,0,0,0,0,0,0},
                                    {0,0,0,0,0,0,0,0,0},
                                    {0,0,0,0,0,0,0,0,0},
```

```
                                {0,0,0,0,0,0,0,0,0},
                                {0,0,0,0,0,0,0,0,0},
                                {0,0,0,0,0,0,0,0,0} };


   int totalNumbersProcessed=1;   ///ranging from 1-81


    long permutations;   // all permutations retrieved from the driver class....
    String Permutations3x3into9x9;   // holds value of all permutations arranging 9 grids from
362800


    int threeBythree[][] = new int[3][3];   // will pass numbers into the map...
    //Set <Integer[][]> s = new HashSet<>();  // used as part of experimention as
documented...


    Set<String> s = new HashSet();   //stores all the strings of permutations


    Set<String> copyPermuations = new HashSet(s);
    //copy of main Set, this was intended to be used if for instance one 3x3 selected, it could
not be used
    //again since each 3x3 grid is unique in 9x9... But became highly irrelevant reducing
362800 by 1 each time


    StringJoiner sj;      //used to format the string added into the set...
    int storeMiniGrids[][][];  // used for testing....

    int currentSize;  //gets current size of the set
    int newSize;  //gets new size of the set....
    int[][] miniGrid;     // this is used to get value out of the map....
    int[][][] miniGridContainer;  //used to store the minigrids into 3d array (part of learning)

    List<Integer> copy = new ArrayList<>(lst);  //mantain original list of possibleNumbers...
    //useful once listed has been emptied and restore it back...

    boolean endFirstRow3x3=false;  //used to ascertain if reached end of row for 3x3 grid...
    Random rand = new Random();   // instance for generating random number....

    String[] completedBoardsLogs = new String[10000];
    //This will store boards in the format:
    //8(0,0) 7(0,1) 1(0,2) 5(1,0) 2(1,1) 9(1,2) 4(2,0) 3(2,1) 6(2,2) 5(0,3) 8(0,4) 9(0,5) 6(1,3)
4(1,4) 7(1,5) 2(2,3) 3(2,4) 1(2,5) 5(0,6) 6(0,7) 4(0,8) 3(1,6) 8(1,7) 1(1,8) 7(2,6) 2(2,7) 9(2,8)
1(3,0) 7(3,1) 4(3,2) 3(4,0) 5(4,1) 6(4,2) 9(5,0) 8(5,1) 2(5,2) 5(3,3) 1(3,4) 8(3,5) 7(4,3) 3(4,4)
2(4,5) 9(5,3) 6(5,4) 4(5,5) 9(3,6) 5(3,7) 3(3,8) 7(4,6) 1(4,7) 8(4,8) 2(5,6) 4(5,7) 6(5,8) 3(6,0)
```

```
6(6,1) 2(6,2) 1(7,0) 4(7,1) 9(7,2) 7(8,0) 8(8,1) 5(8,2) 4(6,3) 3(6,4) 2(6,5) 7(7,3) 6(7,4) 5(7,5)
9(8,3) 1(8,4) 8(8,5) 4(6,6) 1(6,7) 7(6,8) 6(7,6) 5(7,7) 3(7,8) 2(8,6) 8(8,7) 9(8,8)
   //Java or any platform will not allow an array as large as required for storing successful
arrangements of 9x9 grids,
   //let alone the all permutations of 9x9 grids
   // 6,670,903,752,021,072,936,960

   int count=0;   // used in print9x9Board()  for completedBoardsLogs[count]
   int rowIndex=0;  // used for the  row on 9x9 grid
   int colIndex=0;  // used for the  col on 9x9 grid


   int randomNumber1to9List;  //  holds value of  possibleNumbers generated from
lst.get(randomNumber)

   boolean failedColumns;  //passed into sudokuComplete
   boolean failedRows;    //passed into sudokuComplete
   boolean sudokuSuccess;  //this was used for ADVANCE pseudocode,
   //when trying to deal with situation such as getting a success 9x9 grid or failed grid.
   //But it needs too much thought on how to code for high permutations..


   public void wipe9x9Board(int [][]formattedBoard, int nineByNine[][])
   {
      //System.out.println("GET ING HERE !!!!!");
      //System.out.println("before:" + nineByNine[8][8]);
      //formattedBoard = nineByNineCopy.clone();
      //nineByNine = nineByNineCopy.clone();

      //fill each index with 0....

         for (int q=0; q<nineByNine.length; q++)    //can use temp here or also the blank 9x9
grid with 0, same size...
         {
            for (int r=0; r<nineByNine[0].length; r++)

            {
               formattedBoard[q][r]=0;     // wipes buffer, getting numbers from set with string
permutations
               nineByNine[q][r]=0;  // clears 9 x 9 grid. (before it is stored)...
            }

         }
         //System.out.println("after" + nineByNine[8][8]);

   }

  //constructor:
   public Sudoku(long permutations, String  Permutations3x3into9x9)
```

```
    {
        this.permutations =permutations;
        this.Permutations3x3into9x9=Permutations3x3into9x9;


    fill3x3();

    //if end user wants to fill grids manually, they can attempt this and comment top one...
    //But there are issues at moment..
    //fill3x3Manual();

    }


   //This is passed into method below
   //perm3x3[entry3x3],      getnum: 0
   //perm3x3[entry3x3],    getnum: 2...
   //perm3x3[entry3x3],    getnum: 12

   //perm3x3 is getting information from string array (taking all permutation values in the
list)
   //entry3x3  -  this ranges from  0-size of the set
   //it increments each time a set it used..
    //since perm3x3 is formattted as such  1,2,3,4,5,6,7,8,9    getnum has to alterate from
index 0,2,4....

    public int convertStringTo3x3(String permutations3x3, int getNum)
    {
        int temp;
        char num;
        String numString;

                num=permutations3x3.charAt(getNum);
                numString= String.valueOf(num);

                temp= Integer.parseInt(numString);

                //System.out.println("****** PRINT VALUE BACK %%%%%: " + temp);

                return temp;


            }


    //Explanations as below...
    public void fill3x3Manual()
    {
        //This is the new set size: 1   1,7,6,3,5,2,4,8,9
```

```
        //FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
        //[1, 7, 6]
        //[3, 5, 2]
        //[4, 8, 9]

        //We know the above is accepted string format for the numbers in the 3x3 grid....
        //I will populate some grids into the set in a similar way...
        //It will be nine  3x3  squares that will get Sudoku
        //I will also at some point try to experiment with order of these.... to try and get a fully working solution...
        // once I can apply this knowledge here, it will be transferrable to the bigger solution...
        // there is also less clutter here....
        //also I can try and pushing this until it hits  P(9,9)
        // But will need to switch off several system.out.println()!!!!!

        /*
        1 2 3   4 5 6   7 8 9
        4 5 6   7 8 9   1 2 3
        7 8 9   1 2 3   4 5 6

        2 3 1  6 4 5   9 7 8
        5 6 4  9 7 8   3 1 2
        8 9 7  3 1 2   6 4 5

        3 1 2  5 6 4   8 9 7
        6 4 5  8 9 7   2 3 1
        9 7 8  2 3 1   5 6 4
        */


        s.add("1,2,3,4,5,6,7,8,9");
        s.add("4,5,6,7,8,9,1,2,3");
        s.add("7,8,9,1,2,3,4,5,6");
        s.add("2,3,1,5,6,4,8,9,7");
        s.add("6,4,5,9,7,8,3,1,2");
        s.add("9,7,8,3,1,2,6,4,5");
        s.add("3,1,2,6,4,5,9,7,8");
        s.add("5,6,4,8,9,7,2,3,1");
        s.add("8,9,7,2,3,1,5,6,4");


         //get3x3Grid();  can not do this....
        //fill9x9(mp);  // having issue running this.... relies on too much logic from filling it randomnly...



    }
```

```
   public void fill3x3()
   {

     int row=0;
     int col=0;
     int numbersProcessed;   //it will range from 1-81

     sj = new StringJoiner(",");   //new instance of StringJoiner

     System.out.println("There are : " + permutations + " permutations of arranging  3 x 3
grid" );
      System.out.println("There are : " + Permutations3x3into9x9 + " permutations of
arranging  3 x 3 grid into 9 x 9:" + "P(362880,9)" );
     System.out.println("There are : 6,670,903,752,021,072,936,960" + " permutations of
completing sudoku");

     System.out.println("This code will attempt to explore but its impossible to expect
much");
     System.out.println("It is used for foundation of experimentation but also it has made
serious attempt to complete random process to make a grid");
     System.out.println("I am removing excess code so it is ready future development.");

     /*
     //ok so it has completed the full population of a single 3 x 3 grid
     since it has processed   0,0  0,1  0,2
                              1,0  1,1  1,2
                              2,0, 2,1, 2,2
     */


    // KEEP:  this is for set.size().. Set size is determined by end user... It is intended to be set
maximum permutaton = 362800
    //It might need to be decreased due to memory limitations..

     do
     {
        //Could have also been done in other iterative ways...
        //tidy code found on internet...
        IntStream stream = Arrays.stream(possibleNumbers); //Stream to take numbers from
array
       stream.forEach(str -> lst.add(str));  //placing elements stream into a list...



        numbersProcessed=0;  //ranges from, 0-81

       //value decreases once a number chosen for 3x3 grid...
       //System.out.println("*****This is the list size------: " + lst.size());   //list size
```

```
        System.out.println("\n******These are permutations completed:" + s.size());  //set
size



       do    //do while list is not empty
       {
          endFirstRow3x3=false;   // used to mark end of row of 3x3 grid  ([X][2])

          int randomNumber = rand.nextInt(lst.size());
          //this will get 0-8   rand(9)...  this range is useful for getting random number from the
list

          randomNumber1to9List=lst.get(randomNumber);     //it will get 1-9 based on random
index from list...
          threeBythree[row][col]= randomNumber1to9List;

     // since set has failed to work with List<String>, Int[][], Integer[][], String[][]
     //it has proven to work with String....
     //so all the numbers will be concatenated to a String
     //it might be sensible potentially to complete stringjoiner with ,
     //StringTokenizer can be used to perform retrieval....
     //this number here should be exactly stored in threebythree[row][col]

     sj.add(Integer.toString(randomNumber1to9List));  //added to StringJoiner
     lst.remove(randomNumber);  //this removes random number from the list....

     System.out.println("This is new list size: " + lst.size());

     if (col%2==0 && col!=0)    // at this point it has populated row of 3 x 3 grid...
     {

        row++;  //it has to start a new row    for threebythree[][]
        col=0;  //the column is reset back to 0
        endFirstRow3x3 = true;  //flag for reaching end of row...
     }

     if (!endFirstRow3x3)   // it will only do this condition if it hasn't already been reset to 0
as part of new column above...
     {
     col++;  //otherwise it will increase the column in the given row by 1 until above
condition is met...

     }

     numbersProcessed++;   //counter of 1-81 increased....
       }while(!lst.isEmpty());   //while list contains a number 1-9.....
```

```
    currentSize=s.size();
    System.out.println("This is the current set size: " + currentSize);

    s.add(sj.toString());   // since do while loop has ended, it is now in position to
    //add StringJoiner consiting of for example  1,2,3,4,5,6,7,8,9  into the set...

    newSize=s.size();   //check new set size....
    System.out.println("This is the new set size: " + newSize + "     Added:   " + sj.toString());

     sj=new StringJoiner(" ");  //the StringJoiner is now used for.....
     //keeping archive of all numbers numbers going into the board...
     //8(0,0) 7(0,1)   format as follows....


    //this will put the matrix version of 3 x 3 if permutation is unique....
    if (newSize>currentSize)
    {
       mp.put(newSize,threeBythree);  //puts the filled threeBythree into a HashMap...
       //again in my code this is used for limited purpose, it only shows
       //minigrid to end user on screen, since it was easiest way before getting content
available from Set..
    }

    get3x3Grid();  //method call....

    row=0;     // the process starts again
    col=0;  // the process starts again..


    // was contemplating putting a loop inside, but unsure if it right place..
    // it might be useful future when advancing the code...
    //at moment, it is too premature to execute this....

    //}while (!sudokuComplete(failedRows,failedColumns))


    //the top one is default value from permutation class....362,800
    //}while (s.size()<permutations);
    }while (s.size()<20);    // this is getting  <(NUMBER)  x   (3x3 boards)


    fill9x9(mp);   //method call
    get9x9Grid();  //method call

/*
*** PSEUDO CODE   ****
numbers can be generated via random. and stored in int[row][col] array   (0-2 for rows and
col)
get current set size
```

add int[row][col] into the set
get new set size
continue until below condition....
}while (set.size()<P(9,9); // can not do this... since these are permutations if sudoku not met...
// but at same time, it has to explore every single one.....

3 x 3 grids (9 total) filled into 9 x 9 grid int[this will go from 0-8][value from 0-8] (need to think about this!!)
[between 0-2, 3-5, 6-8] [between 0-2, 3-5, 6-8]

//This will be the natural partitions of the set entries....
0-2
3-5
6-8

Checking at each time that the rows and columns do not contain duplicate numbers.....

Print out the grid to end user.....

// this showing that it has placed all small 9 grids inside....
} while (!gridFull)
} end for

*/
  }

  public void fill9x9(Map<Integer, int[][]> mp)
  {
    System.out.println("\nCurrent sudoku board: " + numComplete9x9Boards + " out of " + (int) (s.size()/9));

    /*

// AT THIS POINT I DEVELOPED SOME PSEUDO CODE ON HOW I COULD EXPLORE THE 9x9 GRID
//INTO VARIOUS WAYS... BUT I NEED TO BECOME VERY CONFIDENT WITH MY CODE TO TRY THIS..
//IT WILL ALSO HAVE LIMITATIONS...
****PSEUDO CODE ******

    do
{

col=0 col=1 col=2
start any one of the 3x3 grids in position [0,0] of the row=0[3x3] [3x3] [3x3]

row=1[3x3] [3x3] [3x3]
row=2[3x3] [3x3] [3x3]

*remove it from lst (it is removed since it is believed the 3x3 grid can not be replicated).. and randomnly *pick another 3x3 grid...
*Check if it can go at [0,1]
*if it can, then remove it from lst (since not possible for the grid to go elsewhere).....
*randomnly pick next one from lst.. check if it can go in position [0,2]
*keep going until gridisFull (9x9)
* store the grid...

*next time around.. item that was [0,1] can not go back in same place....
start process again until grid is full

}while(permutations<UNKNOWN> // this means that once it has exceeded set number of permutations, it will end.
*/

```
        // this will store all the values.....
        //not used in my code, but I mantained it here since its usefull and tidier than
        //for each loop  or doing a containsKey and then getting desired item....

        Collection<int[][]> col = mp.values();

        // This i10 just a quick lambda validation that there is a key and expected entry for number keys
        //note the value will not be as expected since its an array....
        //mp.forEach((key, value) -> System.out.println(key + " : " + value));
        //All values print out [[I@e580929   ,  which emphasising issue with using primitive array
        //or any array in that matter...

        int temp[][]=new int[3][3];
       int successfulInputted3x3=0;



        //Since I am so familiar with working with lists and all the entries in HashMap are unique and it
        //consists of int[][] which is the most workable for exercise, I will put all the map values and add it into
        //a list

        //I decided not to use this code, but it offers a simple way to get all map values into different
        //collection
        List <int[][]> lt = new ArrayList<>(mp.values());
        Set <int[][]> st = new HashSet<>(mp.values());
```

```
int rowCount=0;   //used for small 3x3 grid
int colCount=0;   //used for small 3x3 grid
boolean ReachEndColMiniGrid=false;


int offset=0;
int i=1;
int numberOf3x3Processed=0;
int m;
int entry3x3=0;
//int GridCount3x3=1;

//all values in mini grid to be inserted into top left corner...
   // this now functions for first row in 9 x 9
   //need to introduce logic to start for next!!

//**** need to identify where logic will change ***
/*

N N N N N N N N N
N N N N N N N N N
N N N N N N N N N
X 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

The new starting position is no longer [0,0] it is [0,3]  [colIndex, rowIndex]
Unsure what other logic will change with code?
*/

boolean condition1=false;  // used to ensure mutual exclusive nature of conditions later in code and prevent multiple repetitions
boolean condition2=false;  // used to ensure mutual exclusive nature of conditions later in code and prevent multiple repetitions
boolean condition3=false;  // used to ensure mutual exclusive nature of conditions later in code and prevent multiple repetitions


do
{

   //System.out.println("I VALUE: " + i);


//for (int i=0; i<mp.size();i++)     // since the key stored was newsize, and
```

```
                    //this started at 1... so mp.get(1) is the first entry...


        //for (int i=0; i<15; i++)  //using 10 mini grids  for now testing


       // ****  FUTURE CODE  ******************
        // taken from internet, there is no other way to acces the set by index
        //so it contains all the strings...

        //note this will get smaller as items removed from set
        String[] perm3x3 = s.toArray(new String[s.size()]);

            String second3x3StringPlacedInGrid;    //planned to be used advancing my code, not
used at moment...


        //Note the board is valid sudoku when the first 3x3 is in it.
        // It's the second one that causes issues....


        second3x3StringPlacedInGrid=perm3x3[1]; //each time second is removed..... since this
goes into large grid...

        //if (!sudokuSuccess)
        {
        //s.remove(second3x3StringPlacedInGrid);
        //}

       // **********************


      // This validates to be from the matrix printed to screen.. But not necessarily same order..
Not critical....

            //System.out.println("Expect this to be same as string earlier: " + perm3x3[i]);


        //Not putting in loop to have clear visibility of activity....
        //convertString is taking the String from the set and converting to 3 x 3 grid.
        //each value stored individually....

        temp[0][0]=convertStringTo3x3(perm3x3[entry3x3],0);
        temp[0][1]=convertStringTo3x3(perm3x3[entry3x3],2);
        temp[0][2]=convertStringTo3x3(perm3x3[entry3x3],4);
        temp[1][0]=convertStringTo3x3(perm3x3[entry3x3],6);
        temp[1][1]=convertStringTo3x3(perm3x3[entry3x3],8);
        temp[1][2]=convertStringTo3x3(perm3x3[entry3x3],10);
        temp[2][0]=convertStringTo3x3(perm3x3[entry3x3],12);
```

```
        temp[2][1]=convertStringTo3x3(perm3x3[entry3x3],14);
        temp[2][2]=convertStringTo3x3(perm3x3[entry3x3],16);

       //This would be the best time to keep back up of temp[0][0] to ensure same one
appears here until all permutations complete...


     //***************FUTURE CODING****************

      int first3x3GridSelected[][] = new int[3][3];
      int rollBackRowIndex;

      //this is ensuring that if there was sudoku success in first 9x9 grid..
      //It would retain the previously first 3x3 grid in the same position....

      /*
      //QUITE IMPOSSIBLE, TRYING TO DO SITUATON IF SUDOKU FOUND AND RETAINING
FIRST GRID....
      if (sudokuSuccess && entry3x3==0)
      {
         //need to figure out when it would not be the case....
      //logic is when all permutations have happened of all the numbers around it...
      // this would be p(8,8) = 40320
      // So once another 40320 boards have been filled in this scenario...
      //the first 3 x 3 will be available again....
      // and also not allowed in first place again....

        for (int i=0;  i<  40320)
        {
         temp=first3x3GridSelected.clone();
        }
      }
      */


      if (entry3x3==0)
      {
         first3x3GridSelected=temp.clone();
         //Arrays.copyOf(0,0,temp.length);

         //System.out.println("Check for clone: ");


      }

      ////*****************************
```

```
    entry3x3++;



    //board is 9x9 so it will end properly....
    if (totalNumbersProcessed<=81)
    {
    //needs to complete these only once at start to initialise these.
    //not each time otherwise it will affect the entire code..
    //this is a total improvised technique never tried before..
    //but the if statements appear to lock the blocks so that it can only occur once


    //it will go in once since it locks condition2 and condition 3
    //processing [0,0] => [2,8]    27 items

    if (totalNumbersProcessed<=27 && !condition2 && !condition3)
    {

       rollBackRowIndex=rowIndex;    //part of future work.....

       rowIndex=0;
       colIndex=0;
       condition1=true;
       condition2=true;
       condition3=true;

    }

    //once it has has reached number 28, ready start [3,0] => [5,8]  54 items...
    //condition 1 and 3 will be set to false, so it will be locked!

    /*
     N N N N N N N N N
     N N N N N N N N N
     N N N N N N N N N
     N 0 0 0 0 0 0 0 0    Number 28 on this row marked with N
     0 0 0 0 0 0 0 0 0
     0 0 0 0 0 0 0 0 N
     0 0 0 0 0 0 0 0 0
     0 0 0 0 0 0 0 0 0
     0 0 0 0 0 0 0 0 0
    */



    if (totalNumbersProcessed<=54 && totalNumbersProcessed>27 && condition1 &&
condition3)
    {
```

```
            rollBackRowIndex=rowIndex;  // Future code

            rowIndex=3;  //[3,0];
            colIndex=0;
            condition2=true;
            condition1=false;
            condition3=false;
        }


        //checkUniqueColumns()  initially decided to check unique columns here... This
method has quite a flexible point to be called....


        //once it has has reached number 55, ready start [5,0] => [8,8]  81 items....
        //leaving condition3=false and condition2=false will ensure that
        //once totalNumbersProcessed<=27,  it can enter the first if statement.....
        if (totalNumbersProcessed<=81 && totalNumbersProcessed>54 && condition2 &&
!condition1)
        {
            rowIndex=6;  // [6,0]
            colIndex=0;
            condition3=false;
            condition1=true;
            condition2=false;
        }

       System.out.println("****************************************");

         ReachEndColMiniGrid=false;     // this mignt not be required since value already false
from top.
                                //but it was set again anyhow....



 //SOME OF THE THOUGHT PROCESSES TO UNDERSTAND HOW THE 3x3 GRID FROM SET
FILLS THE BOARD...
// ********************
//At moment, once it finishes the first correctly at (2,2)

/*
1 1 1 X 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 X 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
```

```
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
*/

// The next list item should be stored in  (0,3)  - it should be stored here
// current logic is taking it here... (2,3)  as expected.....
//There is no logic in the coding currently telling it to return back here....

//in first last 3 x 3 grid it finished at  (2,2)
//so clearly the rowIndex (of 9x9) has not reset to 0....

//once it has processed 9 numbers, the rowIndex always goes back to  0,3, 6
//it will go to 0 if it is processing first 3 list items (0,1,2 zero index based).
//it will go to 3 if it is processing next 3 list items (3,4,5 zero index based).
//it will go to 6 if it is processing next 3 list items (6,7,8 zero index based).

/*
It now resolves the issue and writes content from (0,3) to (0,5) for the 2nd list item....

1 1 1 X 0 ! 0 0 0
! 0 0 ! 0 0 0 0 0
0 0 X 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

after(0,5) it needs to go to (1,3)     - since colIndex 3 is the new starting point...
it is currently going into  (1,0)  - this is similar to it starting the 2nd row  for the 1st list
item...
//logic is somewhere in the code once it has realised that rowCount has reached 2
*/

//As explained above, it has processed adding all 9 numbers from the set onto bigger grid
//

//Could use a switch here, but for

//0 0 0 0 0 0 0 0 0    RowIndex = 0
//0 0 0 0 0 0 0 0 0    RowIndex = 1
//0 0 0 0 0 0 0 0 0    RowIndex = 2
//0 0 0 0 0 0 0 0 0    RowIndex = 3
//0 0 0 0 0 0 0 0 0    RowIndex = 4
//0 0 0 0 0 0 0 0 0    RowIndex = 5
//0 0 0 0 0 0 0 0 0    RowIndex = 6
//0 0 0 0 0 0 0 0 0    RowIndex = 7
//0 0 0 0 0 0 0 0 0   RowIndex =  8
```

```
// is is taken to be which grid
//it will be later phased out since it is a very generic variable...

if (numberOf3x3Processed==9)    // if it has completed all numbers in the 3 x 3 grid....
{

switch(i)
   {
      case 1:
         rowIndex=0;
         break;
      case 2:
         rowIndex=0;
         break;
      case 3:
         rowIndex=0;
         break;
      case 4:
         rowIndex=3;
         break;
      case 5:
         rowIndex=3;
         break;
      case 6:
         rowIndex=3;
         break;
      case 7:
         rowIndex=6;
         break;
      case 8:
         rowIndex=6;
         break;
      case 9:
         rowIndex=6;
         break;
   }
}


numberOf3x3Processed=0;

         for (int n=0; n<temp.length;n++ )    //temp is array [2][2]
         {

            if (colCount>=2 && rowCount!=2)  // if it reaches last number of  first row
            {
```

```
    rowCount++;   // it starts new row of temp[][]
    colCount=0;   // it starts again at column 0


    //would also have to start new row on big grid..
    rowIndex++;

    //it would only start colIndex if  offset is also equal to 0
    //this would be the case for 1st 3x3 grid.... in each row.....

    if (offset==0)
    {
       colIndex=0;
    }
    else
    {
       colIndex=offset;
    }

    //IT HAS REACHED THE LAST COLUMN BIG GRID..  COLINDEX8..
    //IN THIS CASE, IT HAS TO reset back to start new rowIndex
    //IT SHOULD HIT THIS POINT WHEN numbersprocessed has hit 9...
    //otherwise it has not finished inputting the last 3x3 grid into
    //9x9

    //it has to also start again on big grid
    //but this time it moves down 3 places (rowIndex) from [0,0]  to [3,0]
    //no to overwrite any data....

    if (colIndex==8 && numberOf3x3Processed==9)
    {
       colIndex=0;
       rowIndex=rowIndex+3;
       ReachEndColMiniGrid=true;  //sets flag

    }

    //if it hasn't reached the last column on 9x9
    //and it has processed entire 3 x 3 mini grid...
    //The next grid is adjacent by exactly 1 place (colIndex)
    //

    if (colIndex!=8 && numberOf3x3Processed==9)
    {
       colIndex=colIndex+1;
       rowIndex=0;  //it starts again on top row of 9x9
    }

}
```

```
            //it is uniform array, so can use temp[0] or temp.length

            for (int k=0; k<temp[0].length;k++)  // this will then go through each column in
row....
                        //or each row if temp.length is used....
            {
               numberOf3x3Processed++;


               //this has to keep track of the colIndex (9 by 9 grid)
               //It is stored in offset..
               //otherwise when it starts the next row, it will lose position

               // The offset needs to be considered at commence of each column on temp[][]
               if (k==0)
               {
                  offset=colIndex;   //offset becomes the current colIndex on the 9x9 grid....

               }

               //*** UNSURE WHERE THIS COMMENT RESIDED.. BUT ITS SORT ISSUES I HAD TO
WRITE DOWN ******
                     //PERHAPS THERE ARE EASIER WAYS TO POPULATE THE GRID... BUT I
THINK I HAVE AT LEAST GIVEN IT LOTS
               //FLEXIBILITY POINTS FOR MANIPULATION OF ADDING VALUE....
               //colindex is wrong for the second list item....
               //in first row, its fine since it is set to +1 pos from last grid.
               //when the row has increased, the column has gone to 0, need to change this
logic...


                     //This is expected based on values inputted under no constraints....



                     System.out.println("Selecting grid (3x3) " + i +" from : "+ s.size());
               System.out.println("Total numbers processed so far: " + totalNumbersProcessed
+ " out of 81");
               System.out.println("Current offset in 9x9 grid: " + offset);
               System.out.println("Starting in this col in 9 x 9: " + colIndex);
               System.out.println("The current coordinate(3x3):  " + "(" +rowCount +","+
colCount +")");
               System.out.println("Following number chosen: " + temp[rowCount][colCount]);
               System.out.println("being stored at coordinate(9x9): " + "(" + rowIndex + "," +
colIndex +")");
```

```
            System.out.println("currently processing this from 3 x 3:" + "(" + rowCount + "," +colCount+")");


                    //Follwing added into StringJoiner
                //In this format  8(0,0) 7(0,1)
                    sj.add(temp[rowCount][colCount] + "("+rowIndex+","+colIndex+")");


                //CRITICAL CODE, WITH ALL OFFSETS ABOVE, THIS FINALLY STORES  3x3 GRID INTO 9x9
            // FROM LEFT TO RIGHT, ROW BY ROW
              nineByNine[rowIndex][colIndex]=temp[rowCount][colCount];



              //** FUTURE CODE ****
              //BUT THIS TECHNIQUE FOR PERMUTATION WILL BE TOO EXHAUSTIVE...
              //this can potentially be done after the first 3x3 grid is filled in each row..
              //since one expects the row to be unique at this point...
              //but no harm anyhow doing it now...
              //unfortunately due to nature of code, it has to check after a single number is added on the board...
              //massive overhead...

              //ensure copy of the existing set.....
              //select 1st 3x3 grid..
              //Populate it into 9x9 grid.....
              //remove it from the Set with permutations....


            // FURTHER PSEUDO CODE FOR ADVANCED PART OF TRYING TO GET ALL PERMUTATIONS.....
            // ******** PSEUDO CODE ***********

              //need to work out what to do if its no good the grid...
              // it needs to prevent this minigrid to be selected again in this position (if it violated with first grid), until the numComplete9x9Boards has incremented.

              /*
              if its ok... (this can only be finalised right when numberOf3x3Processed =9)
              remove this 3x3 from the  set....

              When numComplete9x9Boards increases, restore copied set back as original.
              The board that was in column offset 0  [0,0] of 9x9 has to stay there
              until it has exhausted all permutations of 3x3 grids around it...

              */
            // ************************************
```

```
                realTime9x9Fill(sj.toString());    //method call, this also checks for uniquerows
and uniquecols...



            colCount++;  //moves forwad position on 3 x 3

            colIndex++;  //moves forward position on the main 9 x 9

            if (numberOf3x3Processed==9)   //if it has done all values in 3x3
            {
               colCount=0;   //starts again in 3x3
               rowCount=0; //starts again in 3x3
            }

            if (totalNumbersProcessed!=0 && totalNumbersProcessed%9==0)
               {
                  //this is indication that it has finished a 3 x 3 grid....
                  //it has to be done before the incrementing of totalNumbersProcessed

                 System.out.println("row: " + failedRows);
                  System.out.println("col: " + failedColumns);
          System.out.println("Numbers processed in 3x3 grid:" + numberOf3x3Processed);

                  if (numberOf3x3Processed==9)
                  {
                     if (!failedRows&& !failedColumns)
                     {
                        System.out.println("ever here");
                        successfulInputted3x3++;
                     }
                     else
                     {
                        successfulInputted3x3=0;
                     }
                  }

                  System.out.println("Streak of successful 3x3 blocks: " +
successfulInputted3x3);



                  i++;    // goes from 1-9.....

               }

               //indication that it has filled 9 x 9
```

```
                if (totalNumbersProcessed%81==0)
                {

                                //adds ninebynine board into map... Again, this is not used in
coding... But was initially thought that having
                 //aspect of containsKey, it might trigger a technique to try different 9x9
boards....
                  completedBoards.put(numComplete9x9Boards,nineByNine);



                    print9x9Board(sj.toString(), numComplete9x9Boards);  //method call..

                 System.out.println("\nCurrent sudoku board: " + numComplete9x9Boards + "
out of " + (int) (s.size()/9) );
                  numComplete9x9Boards++;




                  totalNumbersProcessed=0;  // starting again..... from 0-81

                          i=1; // reset again...

                  sj = new StringJoiner(" ");  //new StringJoiner to wipe contents....


                    //thie will evaluate to true if there are failedRows and failedColumns....
                    if (sudokuComplete(failedRows, failedColumns))
                    {


                      //this brings original set back....
                      // It is unlikely if actually reducing set size on selection of 3x3 grids...
will increase chance of getting a 9x9 board...
                      //for the moment it is re-instated anyhow....
                      s = new HashSet(copyPermuations);

                      //This variable is for my advanced pseudo, not pursued...
                      sudokuSuccess=true;
                    }

                    else
                    {


                    }
```

```
                    //This was inline with trying to creating new classes of nbn...
                    //But not sure benefit at moment..
                    //it might be useful if techniques are sought to manipulate the 9x9 board
further and keep logic separate from implenting interface....

                    //nbn[nineByNineBoardNumber] = new nineByNine();

                  }

               totalNumbersProcessed++;


            } //end for loop  to go through  columns in each row

                } //end for loop for each row


            System.out.println("************************************");
          }


       }

   }while((numComplete9x9Boards*9)<=s.size()); //end for loop iterate through Set
      //it will end sensibly since numComplete9x9Boards has incremented already.
      // so if the set has 20 (3x3) and it has processed 2 x numComplete9x9Boards
      //3 x 9 = 27....   which exceeds 20.....
   }

  // this prints the board on the screen..
   public void print9x9Board(String currentStringJoinerFullGrid, int numComplete9x9Boards)
   {


     //String currentCompleted9x9Board=completedBoardsLogs[count];     //keeps track of
current 9x9 board....

     //it stores value in array on Strings...
     completedBoardsLogs[count]=currentStringJoinerFullGrid;
     //7(0,0) 2(0,1) 8(0,2) 5(1,0) 3(1,1) 4(1,2) 1(2,0) 9(2,1) 6(2,2) 7(0,3) 5(0,4) 8(0,5) 6(1,3)
2(1,4) 3(1,5) 9(2,3) 4(2,4) 1(2,5) 1(0,6) 3(0,7) 5(0,8) 9(1,6) 4(1,7) 6(1,8) 8(2,6)
     //7(2,7) 2(2,8)

   System.out.println("\nThis is your board number " + (numComplete9x9Boards) + "
summary: " + completedBoardsLogs[count]);
       count=count+1;

      }
```

```
    public void realTime9x9Fill(String history)
    {
       int row=0;
       int col=0;
       int boardValue=0;
       int startLastNumber;

        int rowtoInt=0;
        int coltoInt=0;
        int boardValuetoInt=0;


    System.out.println(history);
  //data in history similar to as below.....
  //7(0,0) 2(0,1) 8(0,2) 5(1,0) 3(1,1) 4(1,2) 1(2,0) 9(2,1) 6(2,2) 7(0,3) 5(0,4) 8(0,5) 6(1,3)
2(1,4) 3(1,5) 9(2,3) 4(2,4) 1(2,5) 1(0,6) 3(0,7) 5(0,8) 9(1,6) 4(1,7) 6(1,8) 8(2,6) 7(2,7) 2(2,8)


        // this means there is only one value in board since no space introduced by
StringJoiner yet...
       if (history.lastIndexOf(" ")==-1)
       {
           row = Character.getNumericValue(history.charAt(2));
           col = Character.getNumericValue(history.charAt(4));
           boardValue= Character.getNumericValue(history.charAt(0));


          formattedBoard [row][col]=boardValue;

       }

        else
        {
           //if history is //7(0,0) 2(0,1) 8(0,2), lastIndex space is before 8

           //all values are chars...
           startLastNumber=history.lastIndexOf(" ");
           row = history.charAt((startLastNumber+3));
           col = history.charAt((startLastNumber+5));
           boardValue = history.charAt((startLastNumber+1));

           //converting all values to integer...
           rowtoInt = Character.getNumericValue(row);
           coltoInt = Character.getNumericValue(col);
           boardValuetoInt= Character.getNumericValue(boardValue);

           //storing into board....
           formattedBoard [rowtoInt][coltoInt]=boardValuetoInt;
```

```
        }

        System.out.println("FILLING BOARD");
        display9x9();

        //implemented, started straight away after 1 number in 9x9
        //if overheads are too high, it can be potentially moved till after entire row is done....
        //since for each number added into 9x9, it has to check for occurences of all
possibleNumbers
        checkUniqueRows(formattedBoard, rowIndex);
        checkUniqueColumns(formattedBoard, colIndex);

      }

      public void display9x9()
      {

        for (int i=0; i<formattedBoard.length; i++)   //for each row
        {

           sj1= new StringJoiner(" ");  // StringJoiner erased before start of processing each
row only


           for (int j=0; j<formattedBoard[0].length; j++)  // for each column in row above....
           {
              sj1.add(Integer.toString(formattedBoard[i][j]));  //since this prints all 81 values
here


           }

           System.out.println(sj1);
         }

      }


   public boolean checkUniqueRows(int[][] nineByNine, int rowIndex)
   {

      int occurenceNumberRow=0;  // it will be cleared each time method is called.
      //even if location of checkUniqueRows is moved after the board is populated, it will still
function...
      //again all this is possible to conserve memory and let program execute more cycles...

      for (int j=0; j<possibleNumbers.length; j++)
      {
         occurenceNumberRow=0;
```

```
        for (int i=0; i<nineByNine[0].length; i++)    //checking column across row
        {

           //here rowIndex will take reference from 9 x 9 grid value...
           //it will keep rowIndex same, but move across each column

           if (possibleNumbers[j]==nineByNine[rowIndex][i])  // this would check
possibleNumbers[j]
           //against all numbers in the grid...

           {
              occurenceNumberRow++;    //increase count of occurrence.

              //default for failedRows is false.. so it doesn't need to be initialised like this..
              //if more once instance of numbr and failedRows=false... (which would be
expected)
              if (occurenceNumberRow>1 && !failedRows)
              {
              failedRows = true;  //there are now failedRows...

              //This was inline advancing my code.
              //For instance if a grid is partially filled with a 3x3 and it does not meet criteria
              //for sudoku, then depending on the number inserted, it might need to move
back to offset,
              //rowIndex and colIndex

              //RollBackRow()  //future coding.....

              }
           }

        }
        //The output of number(1-9) and frequency has to be here before it moves on to
check next from possibleNumbers
        System.out.println("Number: " + possibleNumbers[j] + " has occured: " +
occurenceNumberRow +  " times in  row" + rowIndex);

     }//end of main for loop going through all numbers.....


     return failedRows;   //returns flag value...
  }


  public boolean checkUniqueColumns(int[][] nineByNine, int colIndex)
  {
     //this will simply do a compare of the grid in current state against all possible numbers
```

```
      int occurenceNumberCol=0;


      for (int j=0; j<possibleNumbers.length; j++)
      {
         occurenceNumberCol=0;

         for (int i=0; i<nineByNine.length; i++)    //checking each row.. this is to allow it to
navigate across colIndex
         {
            if (possibleNumbers[j]==nineByNine[i][colIndex])  //here rowIndex will take
reference from 9 x 9 grid value..  it wil move down each row but keep col the same....
            {
               occurenceNumberCol++;

               if (occurenceNumberCol>1 && !failedColumns)
               {
               failedColumns = true;
               }

            }

         }
         System.out.println("Number: " + possibleNumbers[j] + " has occured: " +
occurenceNumberCol +  " times in column " + colIndex);
      }


       //Just need to be careful that default value of failedColumns array will be false...
      // if it set to false on initialisation,  if it finds a false column, it will remain false...
      // Only route to become true is if there are no failed columns at all.
      //Logic has been carried out..

      return failedColumns;

   }

  //duplicateNumbersRow takes values failedRows
  //duplicateNumbersCol takes values failedColumns

  //The board number has been included, since now for maximum execution cycles, all
  //System.out.println() can be turned off except for the below.....
   public boolean sudokuComplete(boolean duplicateNumbersRow, boolean
duplicateNumbersCol)
   {
      //if either flags are true.....  the grid has failed....
      if (duplicateNumbersRow || duplicateNumbersCol)   //if both are true, it means that
sudoku has failed...
               {
```

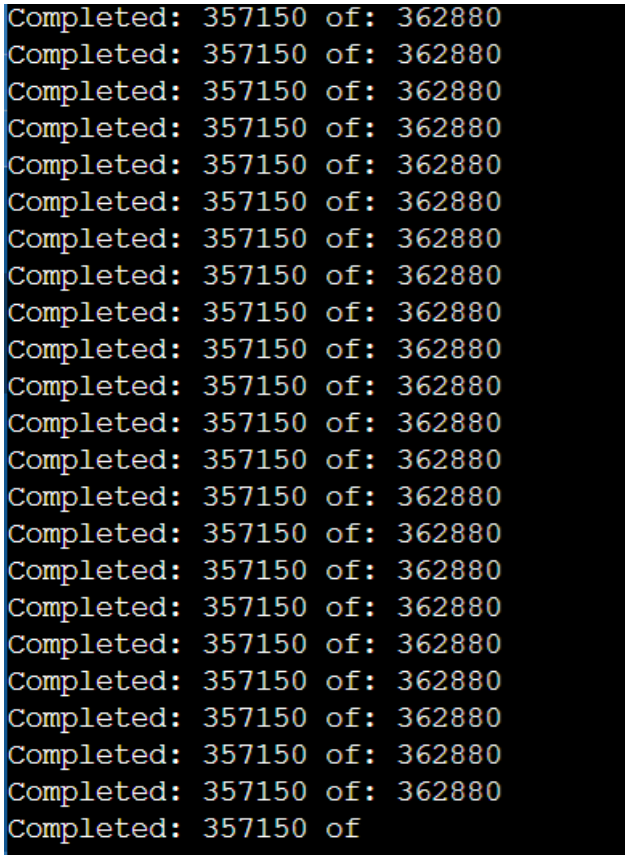
```
                System.out.println("*************************");
                System.out.println("Better luck next time, failed on board: " + count);

                display9x9();
                wipe9x9Board(formattedBoard,nineByNine);

                System.out.println("*************************");

                System.out.println("\n\nMoving onto Board Number: " +
numComplete9x9Boards);

                  failedRows=false;
                failedRows=false;

                return false;

            }
            //otherwise success
            else
            {
                System.out.println("*************************");
                System.out.println("\nCongratulations, sudoku complete on board: " + count);
                System.out.println("");
                System.out.println("*************************");

                display9x9();
                wipe9x9Board(formattedBoard,nineByNine);


                System.out.println("Moving onto Board Number: " +
numComplete9x9Boards);



                return true;
            }

                //two boards are wiped and ready start again....



    }

    public void get9x9Grid()
    {

    }

    //Removing all testing....
```

```
    public void get3x3Grid()
   {

      //this will get out all the 3x3 grids from the permutations.....
      int k=0;
      if (mp.containsKey(newSize))
      {
         miniGrid = mp.get(newSize);
         k++;
      }
            System.out.println("FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING");
      for (int[] g :miniGrid)
      {

         System.out.println(Arrays.toString(g));
      }


}
}


public class Permutation
{
public static void main(String[] args) {
System.out.println("Welcome to Online IDE!! Happy Coding :)");
int originalNumber=9;
int n=originalNumber;
int r =9;
Map <Integer, Long> m = new HashMap<>();
System.out.println("***PERMUTATIONS***");
System.out.println("P(n,r) = n! / (n−r)!");
System.out.println("P(" + n+","+r+") = " + n+"!" + " / " + "("+n+"-"+r+")!");


String
Permutations3x3into9x9="108,883,584,818,776,183,656,945,007,213,012,309,135,068,193
,536,000";
String sudokuSolutions = "6,670,903,752,021,072,936,960";

Sudoku sud = new Sudoku (Permutations (n,r,originalNumber, m),Permutations3x3into9x9);


//I attempted this to try and get the value of  P(362800, 9) to try and get value on the
screen...
//But it was going to produce stack overflow or similar as expected.....
//Since we known  from  P(81,9) =  362800, this will be the new n.....
```

```
//(Permutations ((Permutations (n,r,originalNumber, m),Permutations3x3into9x9)
,r,originalNumber, m),Permutations3x3into9x9);


//System.out.println(Permutations (n,r,originalNumber, m));
}
public static long Permutations (int n, int r, int originalNumber, Map factorialResults)
{
// n are objects
// r is sample
/*
***CALCULATION***
P(n,r) = n! / (n−r)!
*/
long result=0;
int temp;
int denominator;
if (originalNumber<r || r<0)
{
System.out.println("please enter n ≥ r ≥ 0");
System.exit(0);
return 0;
}
if (n>=1)
{
// EXAMPLE
// P (5,6) = 5* 4 * 3 * 2 * 1 / (6-5)! = 24 / 2! = 24 / 2 * 1 = 24/2 = 12
result = (n* (Permutations (n-1, r,originalNumber, factorialResults))); // this completes
factorial for numerator
factorialResults.put(n,result); //result stored in the Map
//System.out.println("getting result back out numerator " + n+": " + factorialResults.get(n));
if (n==originalNumber) // this will occur once
{
denominator = originalNumber-r; // originalNumber required since n has reduced as part of
the recursive calls
//System.out.println("This is denominator: " + denominator);
// this is using the Java Memoization technique to ensure the factorial outcome is not
calculated again, to save program execution cycles.
// since the returns are done in reverse order.... n = 1 is processed first and n=6 last...
//Hence in practice there will be entry in Map for all factorials, ready for the denominator..
if (factorialResults.containsKey(denominator))
{
//System.out.println("here");
//System.out.println("This is exact value of factorial denominator " + (denominator) + " : " +
factorialResults.get(denominator));
return result / (long)factorialResults.get(denominator); // this is number permutations
}
}
return result; // this will be returning already calculating numerator part
```

```
}
return 1; // // it should reach here if this is false: (n>=1) }
}
}
```

**** OUTPUT (ALL SCREEN OUTPUTS REMOVED, EXCEPT CRITICAL) **********



It will also need to report on the boards, which will be 40,320 outputs…
So will reduce screen permutation output to: 357150 – 40320 (**316830**)
This will create 35,203 outputs for verdict of board..
Total is less than 357150 now…

*** OUTPUT WITH SET SIZE REDUCED TO 20 TO DEMONSTRATE FULL CODE EXECUTION **** (SPANNING SEVERAL PAGES, UP TO PAGE 212)….

Note: Permutation.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.
Welcome to Online IDE!! Happy Coding :)
PERMUTATIONS
P(n,r) = n! / (n−r)!
P(9,9) = 9! / (9-9)!
There are : 362880 permutations of arranging 3 x 3 grid

There are : 108,883,584,818,776,183,656,945,007,213,012,309,135,068,193,536,000 permutations of arranging 3 x 3 grid into 9 x 9:P(362880,9)
There are : 6,670,903,752,021,072,936,960 permutations of completing sudoku
This code will attempt to explore but its impossible to expect much
It is used for foundation of experimentation but also it has made serious attempt to complete random process to make a grid
I am removing excess code so it is ready future development.

******These are permutations completed:0
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 0
This is the new set size: 1   Added: 1,8,5,6,9,2,7,4,3
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[1, 8, 5]
[6, 9, 2]
[7, 4, 3]

******These are permutations completed:1
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 1
This is the new set size: 2   Added: 7 1 6 4 8 5 9 3 2
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[7, 1, 6]
[4, 8, 5]
[9, 3, 2]

******These are permutations completed:2
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3

This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 2
This is the new set size: 3 Added: 4 3 1 2 5 6 8 7 9
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[4, 3, 1]
[2, 5, 6]
[8, 7, 9]

******These are permutations completed:3
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 3
This is the new set size: 4 Added: 1 3 4 8 2 9 5 7 6
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[1, 3, 4]
[8, 2, 9]
[5, 7, 6]

******These are permutations completed:4
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 4
This is the new set size: 5 Added: 8 4 3 5 9 1 2 6 7
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[8, 4, 3]
[5, 9, 1]
[2, 6, 7]

******These are permutations completed:5
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5

```
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 5
This is the new set size: 6     Added:   4 8 5 2 3 6 9 1 7
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[4, 8, 5]
[2, 3, 6]
[9, 1, 7]

******These are permutations completed:6
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 6
This is the new set size: 7     Added:   7 2 1 8 4 9 3 5 6
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[7, 2, 1]
[8, 4, 9]
[3, 5, 6]

******These are permutations completed:7
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 7
This is the new set size: 8     Added:   3 7 2 8 9 4 6 5 1
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[3, 7, 2]
[8, 9, 4]
[6, 5, 1]

******These are permutations completed:8
This is new list size: 8
This is new list size: 7
```

This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 8
This is the new set size: 9 Added: 7 5 2 6 4 8 3 9 1
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[7, 5, 2]
[6, 4, 8]
[3, 9, 1]

******These are permutations completed:9
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 9
This is the new set size: 10 Added: 8 2 9 5 1 7 4 6 3
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[8, 2, 9]
[5, 1, 7]
[4, 6, 3]

******These are permutations completed:10
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 10
This is the new set size: 11 Added: 8 1 4 3 6 5 9 2 7
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[8, 1, 4]
[3, 6, 5]
[9, 2, 7]

******These are permutations completed:11

This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 11
This is the new set size: 12 Added: 8 5 9 4 2 1 7 3 6
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[8, 5, 9]
[4, 2, 1]
[7, 3, 6]

******These are permutations completed:12
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 12
This is the new set size: 13 Added: 3 6 4 2 7 8 9 1 5
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[3, 6, 4]
[2, 7, 8]
[9, 1, 5]

******These are permutations completed:13
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 13
This is the new set size: 14 Added: 2 4 1 9 3 7 8 6 5
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[2, 4, 1]
[9, 3, 7]
[8, 6, 5]

******These are permutations completed:14
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 14
This is the new set size: 15 Added: 8 4 2 3 9 7 1 5 6
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[8, 4, 2]
[3, 9, 7]
[1, 5, 6]

******These are permutations completed:15
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 15
This is the new set size: 16 Added: 1 7 8 4 5 9 3 2 6
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[1, 7, 8]
[4, 5, 9]
[3, 2, 6]

******These are permutations completed:16
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 16
This is the new set size: 17 Added: 4 3 8 1 7 5 2 6 9
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[4, 3, 8]

[1, 7, 5]
[2, 6, 9]

******These are permutations completed:17
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 17
This is the new set size: 18 Added: 6 4 3 7 9 1 5 8 2
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[6, 4, 3]
[7, 9, 1]
[5, 8, 2]

******These are permutations completed:18
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 18
This is the new set size: 19 Added: 1 6 4 7 8 2 5 9 3
FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[1, 6, 4]
[7, 8, 2]
[5, 9, 3]

******These are permutations completed:19
This is new list size: 8
This is new list size: 7
This is new list size: 6
This is new list size: 5
This is new list size: 4
This is new list size: 3
This is new list size: 2
This is new list size: 1
This is new list size: 0
This is the current set size: 19
This is the new set size: 20 Added: 1 5 2 3 9 7 4 6 8

FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
[1, 5, 2]
[3, 9, 7]
[4, 6, 8]

Current sudoku board: 1 out of 2
****
Selecting grid (3x3) 1 from : 20
Total numbers processed so far: 1 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 0
The current coordinate(3x3): (0,0)
Following number chosen: 8
being stored at coordinate(9x9): (0,0)
currently processing this from 3 x 3:(0,0)
8(0,0)
FILLING BOARD
8 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row0
Number: 2 has occured: 0 times in row0
Number: 3 has occured: 0 times in row0
Number: 4 has occured: 0 times in row0
Number: 5 has occured: 0 times in row0
Number: 6 has occured: 0 times in row0
Number: 7 has occured: 0 times in row0
Number: 8 has occured: 1 times in row0
Number: 9 has occured: 0 times in row0
Number: 1 has occured: 0 times in column 0
Number: 2 has occured: 0 times in column 0
Number: 3 has occured: 0 times in column 0
Number: 4 has occured: 0 times in column 0
Number: 5 has occured: 0 times in column 0
Number: 6 has occured: 0 times in column 0
Number: 7 has occured: 0 times in column 0
Number: 8 has occured: 1 times in column 0
Number: 9 has occured: 0 times in column 0
Selecting grid (3x3) 1 from : 20
Total numbers processed so far: 2 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 1
The current coordinate(3x3): (0,1)

Following number chosen: 2
being stored at coordinate(9x9): (0,1)
currently processing this from 3 x 3:(0,1)
8(0,0) 2(0,1)
FILLING BOARD
8 2 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row0
Number: 2 has occured: 1 times in row0
Number: 3 has occured: 0 times in row0
Number: 4 has occured: 0 times in row0
Number: 5 has occured: 0 times in row0
Number: 6 has occured: 0 times in row0
Number: 7 has occured: 0 times in row0
Number: 8 has occured: 1 times in row0
Number: 9 has occured: 0 times in row0
Number: 1 has occured: 0 times in column 1
Number: 2 has occured: 1 times in column 1
Number: 3 has occured: 0 times in column 1
Number: 4 has occured: 0 times in column 1
Number: 5 has occured: 0 times in column 1
Number: 6 has occured: 0 times in column 1
Number: 7 has occured: 0 times in column 1
Number: 8 has occured: 0 times in column 1
Number: 9 has occured: 0 times in column 1
Selecting grid (3x3) 1 from : 20
Total numbers processed so far: 3 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 2
The current coordinate(3x3): (0,2)
Following number chosen: 9
being stored at coordinate(9x9): (0,2)
currently processing this from 3 x 3:(0,2)
8(0,0) 2(0,1) 9(0,2)
FILLING BOARD
8 2 9 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row0
Number: 2 has occured: 1 times in row0
Number: 3 has occured: 0 times in row0
Number: 4 has occured: 0 times in row0
Number: 5 has occured: 0 times in row0
Number: 6 has occured: 0 times in row0
Number: 7 has occured: 0 times in row0
Number: 8 has occured: 1 times in row0
Number: 9 has occured: 1 times in row0
Number: 1 has occured: 0 times in column 2
Number: 2 has occured: 0 times in column 2
Number: 3 has occured: 0 times in column 2
Number: 4 has occured: 0 times in column 2
Number: 5 has occured: 0 times in column 2
Number: 6 has occured: 0 times in column 2
Number: 7 has occured: 0 times in column 2
Number: 8 has occured: 0 times in column 2
Number: 9 has occured: 1 times in column 2
Selecting grid (3x3) 1 from : 20
Total numbers processed so far: 4 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 0
The current coordinate(3x3): (1,0)
Following number chosen: 5
being stored at coordinate(9x9): (1,0)
currently processing this from 3 x 3:(1,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0)
FILLING BOARD
8 2 9 0 0 0 0 0 0
5 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row1
Number: 2 has occured: 0 times in row1
Number: 3 has occured: 0 times in row1
Number: 4 has occured: 0 times in row1
Number: 5 has occured: 1 times in row1
Number: 6 has occured: 0 times in row1
Number: 7 has occured: 0 times in row1
Number: 8 has occured: 0 times in row1
Number: 9 has occured: 0 times in row1
Number: 1 has occured: 0 times in column 0

Number: 2 has occured: 0 times in column 0
Number: 3 has occured: 0 times in column 0
Number: 4 has occured: 0 times in column 0
Number: 5 has occured: 1 times in column 0
Number: 6 has occured: 0 times in column 0
Number: 7 has occured: 0 times in column 0
Number: 8 has occured: 1 times in column 0
Number: 9 has occured: 0 times in column 0
Selecting grid (3x3) 1 from : 20
Total numbers processed so far: 5 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 1
The current coordinate(3x3): (1,1)
Following number chosen: 1
being stored at coordinate(9x9): (1,1)
currently processing this from 3 x 3:(1,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1)
FILLING BOARD
8 2 9 0 0 0 0 0 0
5 1 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row1
Number: 2 has occured: 0 times in row1
Number: 3 has occured: 0 times in row1
Number: 4 has occured: 0 times in row1
Number: 5 has occured: 1 times in row1
Number: 6 has occured: 0 times in row1
Number: 7 has occured: 0 times in row1
Number: 8 has occured: 0 times in row1
Number: 9 has occured: 0 times in row1
Number: 1 has occured: 1 times in column 1
Number: 2 has occured: 1 times in column 1
Number: 3 has occured: 0 times in column 1
Number: 4 has occured: 0 times in column 1
Number: 5 has occured: 0 times in column 1
Number: 6 has occured: 0 times in column 1
Number: 7 has occured: 0 times in column 1
Number: 8 has occured: 0 times in column 1
Number: 9 has occured: 0 times in column 1
Selecting grid (3x3) 1 from : 20
Total numbers processed so far: 6 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 2

The current coordinate(3x3): (1,2)
Following number chosen: 7
being stored at coordinate(9x9): (1,2)
currently processing this from 3 x 3:(1,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2)
FILLING BOARD
8 2 9 0 0 0 0 0 0
5 1 7 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row1
Number: 2 has occured: 0 times in row1
Number: 3 has occured: 0 times in row1
Number: 4 has occured: 0 times in row1
Number: 5 has occured: 1 times in row1
Number: 6 has occured: 0 times in row1
Number: 7 has occured: 1 times in row1
Number: 8 has occured: 0 times in row1
Number: 9 has occured: 0 times in row1
Number: 1 has occured: 0 times in column 2
Number: 2 has occured: 0 times in column 2
Number: 3 has occured: 0 times in column 2
Number: 4 has occured: 0 times in column 2
Number: 5 has occured: 0 times in column 2
Number: 6 has occured: 0 times in column 2
Number: 7 has occured: 1 times in column 2
Number: 8 has occured: 0 times in column 2
Number: 9 has occured: 1 times in column 2
Selecting grid (3x3) 1 from : 20
Total numbers processed so far: 7 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 0
The current coordinate(3x3): (2,0)
Following number chosen: 4
being stored at coordinate(9x9): (2,0)
currently processing this from 3 x 3:(2,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0)
FILLING BOARD
8 2 9 0 0 0 0 0 0
5 1 7 0 0 0 0 0 0
4 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row2
Number: 2 has occured: 0 times in row2
Number: 3 has occured: 0 times in row2
Number: 4 has occured: 1 times in row2
Number: 5 has occured: 0 times in row2
Number: 6 has occured: 0 times in row2
Number: 7 has occured: 0 times in row2
Number: 8 has occured: 0 times in row2
Number: 9 has occured: 0 times in row2
Number: 1 has occured: 0 times in column 0
Number: 2 has occured: 0 times in column 0
Number: 3 has occured: 0 times in column 0
Number: 4 has occured: 1 times in column 0
Number: 5 has occured: 1 times in column 0
Number: 6 has occured: 0 times in column 0
Number: 7 has occured: 0 times in column 0
Number: 8 has occured: 1 times in column 0
Number: 9 has occured: 0 times in column 0
Selecting grid (3x3) 1 from : 20
Total numbers processed so far: 8 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 1
The current coordinate(3x3): (2,1)
Following number chosen: 6
being stored at coordinate(9x9): (2,1)
currently processing this from 3 x 3:(2,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1)
FILLING BOARD
8 2 9 0 0 0 0 0 0
5 1 7 0 0 0 0 0 0
4 6 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row2
Number: 2 has occured: 0 times in row2
Number: 3 has occured: 0 times in row2
Number: 4 has occured: 1 times in row2
Number: 5 has occured: 0 times in row2
Number: 6 has occured: 1 times in row2
Number: 7 has occured: 0 times in row2
Number: 8 has occured: 0 times in row2
Number: 9 has occured: 0 times in row2

Number: 1 has occured: 1 times in column 1
Number: 2 has occured: 1 times in column 1
Number: 3 has occured: 0 times in column 1
Number: 4 has occured: 0 times in column 1
Number: 5 has occured: 0 times in column 1
Number: 6 has occured: 1 times in column 1
Number: 7 has occured: 0 times in column 1
Number: 8 has occured: 0 times in column 1
Number: 9 has occured: 0 times in column 1
Selecting grid (3x3) 1 from : 20
Total numbers processed so far: 9 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 2
The current coordinate(3x3): (2,2)
Following number chosen: 3
being stored at coordinate(9x9): (2,2)
currently processing this from 3 x 3:(2,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2)
FILLING BOARD
8 2 9 0 0 0 0 0 0
5 1 7 0 0 0 0 0 0
4 6 3 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row2
Number: 2 has occured: 0 times in row2
Number: 3 has occured: 1 times in row2
Number: 4 has occured: 1 times in row2
Number: 5 has occured: 0 times in row2
Number: 6 has occured: 1 times in row2
Number: 7 has occured: 0 times in row2
Number: 8 has occured: 0 times in row2
Number: 9 has occured: 0 times in row2
Number: 1 has occured: 0 times in column 2
Number: 2 has occured: 0 times in column 2
Number: 3 has occured: 1 times in column 2
Number: 4 has occured: 0 times in column 2
Number: 5 has occured: 0 times in column 2
Number: 6 has occured: 0 times in column 2
Number: 7 has occured: 1 times in column 2
Number: 8 has occured: 0 times in column 2
Number: 9 has occured: 1 times in column 2
****
****
Selecting grid (3x3) 2 from : 20

Total numbers processed so far: 10 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 3
The current coordinate(3x3): (0,0)
Following number chosen: 8
being stored at coordinate(9x9): (0,3)
currently processing this from 3 x 3:(0,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3)
FILLING BOARD
8 2 9 8 0 0 0 0 0
5 1 7 0 0 0 0 0 0
4 6 3 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row0
Number: 2 has occured: 1 times in row0
Number: 3 has occured: 0 times in row0
Number: 4 has occured: 0 times in row0
Number: 5 has occured: 0 times in row0
Number: 6 has occured: 0 times in row0
Number: 7 has occured: 0 times in row0
Number: 8 has occured: 2 times in row0
Number: 9 has occured: 1 times in row0
Number: 1 has occured: 0 times in column 3
Number: 2 has occured: 0 times in column 3
Number: 3 has occured: 0 times in column 3
Number: 4 has occured: 0 times in column 3
Number: 5 has occured: 0 times in column 3
Number: 6 has occured: 0 times in column 3
Number: 7 has occured: 0 times in column 3
Number: 8 has occured: 1 times in column 3
Number: 9 has occured: 0 times in column 3
Selecting grid (3x3) 2 from : 20
Total numbers processed so far: 11 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 4
The current coordinate(3x3): (0,1)
Following number chosen: 1
being stored at coordinate(9x9): (0,4)
currently processing this from 3 x 3:(0,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4)
FILLING BOARD
8 2 9 8 1 0 0 0 0
5 1 7 0 0 0 0 0 0
4 6 3 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row0
Number: 2 has occured: 1 times in row0
Number: 3 has occured: 0 times in row0
Number: 4 has occured: 0 times in row0
Number: 5 has occured: 0 times in row0
Number: 6 has occured: 0 times in row0
Number: 7 has occured: 0 times in row0
Number: 8 has occured: 2 times in row0
Number: 9 has occured: 1 times in row0
Number: 1 has occured: 1 times in column 4
Number: 2 has occured: 0 times in column 4
Number: 3 has occured: 0 times in column 4
Number: 4 has occured: 0 times in column 4
Number: 5 has occured: 0 times in column 4
Number: 6 has occured: 0 times in column 4
Number: 7 has occured: 0 times in column 4
Number: 8 has occured: 0 times in column 4
Number: 9 has occured: 0 times in column 4
Selecting grid (3x3) 2 from : 20
Total numbers processed so far: 12 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 5
The current coordinate(3x3): (0,2)
Following number chosen: 4
being stored at coordinate(9x9): (0,5)
currently processing this from 3 x 3:(0,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5)
FILLING BOARD
8 2 9 8 1 4 0 0 0
5 1 7 0 0 0 0 0 0
4 6 3 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row0
Number: 2 has occured: 1 times in row0
Number: 3 has occured: 0 times in row0
Number: 4 has occured: 1 times in row0
Number: 5 has occured: 0 times in row0
Number: 6 has occured: 0 times in row0

Number: 7 has occured: 0 times in row0
Number: 8 has occured: 2 times in row0
Number: 9 has occured: 1 times in row0
Number: 1 has occured: 0 times in column 5
Number: 2 has occured: 0 times in column 5
Number: 3 has occured: 0 times in column 5
Number: 4 has occured: 1 times in column 5
Number: 5 has occured: 0 times in column 5
Number: 6 has occured: 0 times in column 5
Number: 7 has occured: 0 times in column 5
Number: 8 has occured: 0 times in column 5
Number: 9 has occured: 0 times in column 5
Selecting grid (3x3) 2 from : 20
Total numbers processed so far: 13 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 3
The current coordinate(3x3): (1,0)
Following number chosen: 3
being stored at coordinate(9x9): (1,3)
currently processing this from 3 x 3:(1,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3)
FILLING BOARD
8 2 9 8 1 4 0 0 0
5 1 7 3 0 0 0 0 0
4 6 3 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row1
Number: 2 has occured: 0 times in row1
Number: 3 has occured: 1 times in row1
Number: 4 has occured: 0 times in row1
Number: 5 has occured: 1 times in row1
Number: 6 has occured: 0 times in row1
Number: 7 has occured: 1 times in row1
Number: 8 has occured: 0 times in row1
Number: 9 has occured: 0 times in row1
Number: 1 has occured: 0 times in column 3
Number: 2 has occured: 0 times in column 3
Number: 3 has occured: 1 times in column 3
Number: 4 has occured: 0 times in column 3
Number: 5 has occured: 0 times in column 3
Number: 6 has occured: 0 times in column 3
Number: 7 has occured: 0 times in column 3
Number: 8 has occured: 1 times in column 3
Number: 9 has occured: 0 times in column 3

Selecting grid (3x3) 2 from : 20
Total numbers processed so far: 14 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 4
The current coordinate(3x3): (1,1)
Following number chosen: 6
being stored at coordinate(9x9): (1,4)
currently processing this from 3 x 3:(1,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
FILLING BOARD
8 2 9 8 1 4 0 0 0
5 1 7 3 6 0 0 0 0
4 6 3 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row1
Number: 2 has occured: 0 times in row1
Number: 3 has occured: 1 times in row1
Number: 4 has occured: 0 times in row1
Number: 5 has occured: 1 times in row1
Number: 6 has occured: 1 times in row1
Number: 7 has occured: 1 times in row1
Number: 8 has occured: 0 times in row1
Number: 9 has occured: 0 times in row1
Number: 1 has occured: 1 times in column 4
Number: 2 has occured: 0 times in column 4
Number: 3 has occured: 0 times in column 4
Number: 4 has occured: 0 times in column 4
Number: 5 has occured: 0 times in column 4
Number: 6 has occured: 1 times in column 4
Number: 7 has occured: 0 times in column 4
Number: 8 has occured: 0 times in column 4
Number: 9 has occured: 0 times in column 4
Selecting grid (3x3) 2 from : 20
Total numbers processed so far: 15 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 5
The current coordinate(3x3): (1,2)
Following number chosen: 5
being stored at coordinate(9x9): (1,5)
currently processing this from 3 x 3:(1,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5)
FILLING BOARD
8 2 9 8 1 4 0 0 0

5 1 7 3 6 5 0 0 0
4 6 3 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row1
Number: 2 has occured: 0 times in row1
Number: 3 has occured: 1 times in row1
Number: 4 has occured: 0 times in row1
Number: 5 has occured: 2 times in row1
Number: 6 has occured: 1 times in row1
Number: 7 has occured: 1 times in row1
Number: 8 has occured: 0 times in row1
Number: 9 has occured: 0 times in row1
Number: 1 has occured: 0 times in column 5
Number: 2 has occured: 0 times in column 5
Number: 3 has occured: 0 times in column 5
Number: 4 has occured: 1 times in column 5
Number: 5 has occured: 1 times in column 5
Number: 6 has occured: 0 times in column 5
Number: 7 has occured: 0 times in column 5
Number: 8 has occured: 0 times in column 5
Number: 9 has occured: 0 times in column 5
Selecting grid (3x3) 2 from : 20
Total numbers processed so far: 16 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 3
The current coordinate(3x3): (2,0)
Following number chosen: 9
being stored at coordinate(9x9): (2,3)
currently processing this from 3 x 3:(2,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3)
FILLING BOARD
8 2 9 8 1 4 0 0 0
5 1 7 3 6 5 0 0 0
4 6 3 9 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row2
Number: 2 has occured: 0 times in row2
Number: 3 has occured: 1 times in row2

Number: 4 has occured: 1 times in row2
Number: 5 has occured: 0 times in row2
Number: 6 has occured: 1 times in row2
Number: 7 has occured: 0 times in row2
Number: 8 has occured: 0 times in row2
Number: 9 has occured: 1 times in row2
Number: 1 has occured: 0 times in column 3
Number: 2 has occured: 0 times in column 3
Number: 3 has occured: 1 times in column 3
Number: 4 has occured: 0 times in column 3
Number: 5 has occured: 0 times in column 3
Number: 6 has occured: 0 times in column 3
Number: 7 has occured: 0 times in column 3
Number: 8 has occured: 1 times in column 3
Number: 9 has occured: 1 times in column 3
Selecting grid (3x3) 2 from : 20
Total numbers processed so far: 17 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 4
The current coordinate(3x3): (2,1)
Following number chosen: 2
being stored at coordinate(9x9): (2,4)
currently processing this from 3 x 3:(2,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4)
FILLING BOARD
8 2 9 8 1 4 0 0 0
5 1 7 3 6 5 0 0 0
4 6 3 9 2 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row2
Number: 2 has occured: 1 times in row2
Number: 3 has occured: 1 times in row2
Number: 4 has occured: 1 times in row2
Number: 5 has occured: 0 times in row2
Number: 6 has occured: 1 times in row2
Number: 7 has occured: 0 times in row2
Number: 8 has occured: 0 times in row2
Number: 9 has occured: 1 times in row2
Number: 1 has occured: 1 times in column 4
Number: 2 has occured: 1 times in column 4
Number: 3 has occured: 0 times in column 4
Number: 4 has occured: 0 times in column 4
Number: 5 has occured: 0 times in column 4

Number: 6 has occured: 1 times in column 4
Number: 7 has occured: 0 times in column 4
Number: 8 has occured: 0 times in column 4
Number: 9 has occured: 0 times in column 4
Selecting grid (3x3) 2 from : 20
Total numbers processed so far: 18 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 5
The current coordinate(3x3): (2,2)
Following number chosen: 7
being stored at coordinate(9x9): (2,5)
currently processing this from 3 x 3:(2,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5)
FILLING BOARD
8 2 9 8 1 4 0 0 0
5 1 7 3 6 5 0 0 0
4 6 3 9 2 7 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row2
Number: 2 has occured: 1 times in row2
Number: 3 has occured: 1 times in row2
Number: 4 has occured: 1 times in row2
Number: 5 has occured: 0 times in row2
Number: 6 has occured: 1 times in row2
Number: 7 has occured: 1 times in row2
Number: 8 has occured: 0 times in row2
Number: 9 has occured: 1 times in row2
Number: 1 has occured: 0 times in column 5
Number: 2 has occured: 0 times in column 5
Number: 3 has occured: 0 times in column 5
Number: 4 has occured: 1 times in column 5
Number: 5 has occured: 1 times in column 5
Number: 6 has occured: 0 times in column 5
Number: 7 has occured: 1 times in column 5
Number: 8 has occured: 0 times in column 5
Number: 9 has occured: 0 times in column 5
****
****
Selecting grid (3x3) 3 from : 20
Total numbers processed so far: 19 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 6
The current coordinate(3x3): (0,0)

Following number chosen: 3
being stored at coordinate(9x9): (0,6)
currently processing this from 3 x 3:(0,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6)
FILLING BOARD
8 2 9 8 1 4 3 0 0
5 1 7 3 6 5 0 0 0
4 6 3 9 2 7 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row0
Number: 2 has occured: 1 times in row0
Number: 3 has occured: 1 times in row0
Number: 4 has occured: 1 times in row0
Number: 5 has occured: 0 times in row0
Number: 6 has occured: 0 times in row0
Number: 7 has occured: 0 times in row0
Number: 8 has occured: 2 times in row0
Number: 9 has occured: 1 times in row0
Number: 1 has occured: 0 times in column 6
Number: 2 has occured: 0 times in column 6
Number: 3 has occured: 1 times in column 6
Number: 4 has occured: 0 times in column 6
Number: 5 has occured: 0 times in column 6
Number: 6 has occured: 0 times in column 6
Number: 7 has occured: 0 times in column 6
Number: 8 has occured: 0 times in column 6
Number: 9 has occured: 0 times in column 6
Selecting grid (3x3) 3 from : 20
Total numbers processed so far: 20 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 7
The current coordinate(3x3): (0,1)
Following number chosen: 7
being stored at coordinate(9x9): (0,7)
currently processing this from 3 x 3:(0,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7)
FILLING BOARD
8 2 9 8 1 4 3 7 0
5 1 7 3 6 5 0 0 0
4 6 3 9 2 7 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row0
Number: 2 has occured: 1 times in row0
Number: 3 has occured: 1 times in row0
Number: 4 has occured: 1 times in row0
Number: 5 has occured: 0 times in row0
Number: 6 has occured: 0 times in row0
Number: 7 has occured: 1 times in row0
Number: 8 has occured: 2 times in row0
Number: 9 has occured: 1 times in row0
Number: 1 has occured: 0 times in column 7
Number: 2 has occured: 0 times in column 7
Number: 3 has occured: 0 times in column 7
Number: 4 has occured: 0 times in column 7
Number: 5 has occured: 0 times in column 7
Number: 6 has occured: 0 times in column 7
Number: 7 has occured: 1 times in column 7
Number: 8 has occured: 0 times in column 7
Number: 9 has occured: 0 times in column 7
Selecting grid (3x3) 3 from : 20
Total numbers processed so far: 21 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 8
The current coordinate(3x3): (0,2)
Following number chosen: 2
being stored at coordinate(9x9): (0,8)
currently processing this from 3 x 3:(0,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 0 0 0
4 6 3 9 2 7 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row0
Number: 2 has occured: 2 times in row0
Number: 3 has occured: 1 times in row0
Number: 4 has occured: 1 times in row0
Number: 5 has occured: 0 times in row0
Number: 6 has occured: 0 times in row0
Number: 7 has occured: 1 times in row0

Number: 8 has occured: 2 times in row0
Number: 9 has occured: 1 times in row0
Number: 1 has occured: 0 times in column 8
Number: 2 has occured: 1 times in column 8
Number: 3 has occured: 0 times in column 8
Number: 4 has occured: 0 times in column 8
Number: 5 has occured: 0 times in column 8
Number: 6 has occured: 0 times in column 8
Number: 7 has occured: 0 times in column 8
Number: 8 has occured: 0 times in column 8
Number: 9 has occured: 0 times in column 8
Selecting grid (3x3) 3 from : 20
Total numbers processed so far: 22 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 6
The current coordinate(3x3): (1,0)
Following number chosen: 8
being stored at coordinate(9x9): (1,6)
currently processing this from 3 x 3:(1,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 0 0
4 6 3 9 2 7 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row1
Number: 2 has occured: 0 times in row1
Number: 3 has occured: 1 times in row1
Number: 4 has occured: 0 times in row1
Number: 5 has occured: 2 times in row1
Number: 6 has occured: 1 times in row1
Number: 7 has occured: 1 times in row1
Number: 8 has occured: 1 times in row1
Number: 9 has occured: 0 times in row1
Number: 1 has occured: 0 times in column 6
Number: 2 has occured: 0 times in column 6
Number: 3 has occured: 1 times in column 6
Number: 4 has occured: 0 times in column 6
Number: 5 has occured: 0 times in column 6
Number: 6 has occured: 0 times in column 6
Number: 7 has occured: 0 times in column 6
Number: 8 has occured: 1 times in column 6
Number: 9 has occured: 0 times in column 6

Selecting grid (3x3) 3 from : 20
Total numbers processed so far: 23 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 7
The current coordinate(3x3): (1,1)
Following number chosen: 9
being stored at coordinate(9x9): (1,7)
currently processing this from 3 x 3:(1,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 0
4 6 3 9 2 7 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row1
Number: 2 has occured: 0 times in row1
Number: 3 has occured: 1 times in row1
Number: 4 has occured: 0 times in row1
Number: 5 has occured: 2 times in row1
Number: 6 has occured: 1 times in row1
Number: 7 has occured: 1 times in row1
Number: 8 has occured: 1 times in row1
Number: 9 has occured: 1 times in row1
Number: 1 has occured: 0 times in column 7
Number: 2 has occured: 0 times in column 7
Number: 3 has occured: 0 times in column 7
Number: 4 has occured: 0 times in column 7
Number: 5 has occured: 0 times in column 7
Number: 6 has occured: 0 times in column 7
Number: 7 has occured: 1 times in column 7
Number: 8 has occured: 0 times in column 7
Number: 9 has occured: 1 times in column 7
Selecting grid (3x3) 3 from : 20
Total numbers processed so far: 24 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 8
The current coordinate(3x3): (1,2)
Following number chosen: 4
being stored at coordinate(9x9): (1,8)
currently processing this from 3 x 3:(1,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8)
FILLING BOARD

8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row1
Number: 2 has occured: 0 times in row1
Number: 3 has occured: 1 times in row1
Number: 4 has occured: 1 times in row1
Number: 5 has occured: 2 times in row1
Number: 6 has occured: 1 times in row1
Number: 7 has occured: 1 times in row1
Number: 8 has occured: 1 times in row1
Number: 9 has occured: 1 times in row1
Number: 1 has occured: 0 times in column 8
Number: 2 has occured: 1 times in column 8
Number: 3 has occured: 0 times in column 8
Number: 4 has occured: 1 times in column 8
Number: 5 has occured: 0 times in column 8
Number: 6 has occured: 0 times in column 8
Number: 7 has occured: 0 times in column 8
Number: 8 has occured: 0 times in column 8
Number: 9 has occured: 0 times in column 8
Selecting grid (3x3) 3 from : 20
Total numbers processed so far: 25 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 6
The current coordinate(3x3): (2,0)
Following number chosen: 6
being stored at coordinate(9x9): (2,6)
currently processing this from 3 x 3:(2,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row2
Number: 2 has occured: 1 times in row2

Number: 3 has occured: 1 times in row2
Number: 4 has occured: 1 times in row2
Number: 5 has occured: 0 times in row2
Number: 6 has occured: 2 times in row2
Number: 7 has occured: 1 times in row2
Number: 8 has occured: 0 times in row2
Number: 9 has occured: 1 times in row2
Number: 1 has occured: 0 times in column 6
Number: 2 has occured: 0 times in column 6
Number: 3 has occured: 1 times in column 6
Number: 4 has occured: 0 times in column 6
Number: 5 has occured: 0 times in column 6
Number: 6 has occured: 1 times in column 6
Number: 7 has occured: 0 times in column 6
Number: 8 has occured: 1 times in column 6
Number: 9 has occured: 0 times in column 6
Selecting grid (3x3) 3 from : 20
Total numbers processed so far: 26 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 7
The current coordinate(3x3): (2,1)
Following number chosen: 5
being stored at coordinate(9x9): (2,7)
currently processing this from 3 x 3:(2,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row2
Number: 2 has occured: 1 times in row2
Number: 3 has occured: 1 times in row2
Number: 4 has occured: 1 times in row2
Number: 5 has occured: 1 times in row2
Number: 6 has occured: 2 times in row2
Number: 7 has occured: 1 times in row2
Number: 8 has occured: 0 times in row2
Number: 9 has occured: 1 times in row2
Number: 1 has occured: 0 times in column 7
Number: 2 has occured: 0 times in column 7
Number: 3 has occured: 0 times in column 7
Number: 4 has occured: 0 times in column 7

Number: 5 has occured: 1 times in column 7
Number: 6 has occured: 0 times in column 7
Number: 7 has occured: 1 times in column 7
Number: 8 has occured: 0 times in column 7
Number: 9 has occured: 1 times in column 7
Selecting grid (3x3) 3 from : 20
Total numbers processed so far: 27 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 8
The current coordinate(3x3): (2,2)
Following number chosen: 1
being stored at coordinate(9x9): (2,8)
currently processing this from 3 x 3:(2,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row2
Number: 2 has occured: 1 times in row2
Number: 3 has occured: 1 times in row2
Number: 4 has occured: 1 times in row2
Number: 5 has occured: 1 times in row2
Number: 6 has occured: 2 times in row2
Number: 7 has occured: 1 times in row2
Number: 8 has occured: 0 times in row2
Number: 9 has occured: 1 times in row2
Number: 1 has occured: 1 times in column 8
Number: 2 has occured: 1 times in column 8
Number: 3 has occured: 0 times in column 8
Number: 4 has occured: 1 times in column 8
Number: 5 has occured: 0 times in column 8
Number: 6 has occured: 0 times in column 8
Number: 7 has occured: 0 times in column 8
Number: 8 has occured: 0 times in column 8
Number: 9 has occured: 0 times in column 8
****
****
Selecting grid (3x3) 4 from : 20
Total numbers processed so far: 28 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 0

The current coordinate(3x3): (0,0)
Following number chosen: 7
being stored at coordinate(9x9): (3,0)
currently processing this from 3 x 3:(0,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row3
Number: 2 has occured: 0 times in row3
Number: 3 has occured: 0 times in row3
Number: 4 has occured: 0 times in row3
Number: 5 has occured: 0 times in row3
Number: 6 has occured: 0 times in row3
Number: 7 has occured: 1 times in row3
Number: 8 has occured: 0 times in row3
Number: 9 has occured: 0 times in row3
Number: 1 has occured: 0 times in column 0
Number: 2 has occured: 0 times in column 0
Number: 3 has occured: 0 times in column 0
Number: 4 has occured: 1 times in column 0
Number: 5 has occured: 1 times in column 0
Number: 6 has occured: 0 times in column 0
Number: 7 has occured: 1 times in column 0
Number: 8 has occured: 1 times in column 0
Number: 9 has occured: 0 times in column 0
Selecting grid (3x3) 4 from : 20
Total numbers processed so far: 29 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 1
The current coordinate(3x3): (0,1)
Following number chosen: 5
being stored at coordinate(9x9): (3,1)
currently processing this from 3 x 3:(0,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0) 5(3,1)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1

7 5 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row3
Number: 2 has occured: 0 times in row3
Number: 3 has occured: 0 times in row3
Number: 4 has occured: 0 times in row3
Number: 5 has occured: 1 times in row3
Number: 6 has occured: 0 times in row3
Number: 7 has occured: 1 times in row3
Number: 8 has occured: 0 times in row3
Number: 9 has occured: 0 times in row3
Number: 1 has occured: 1 times in column 1
Number: 2 has occured: 1 times in column 1
Number: 3 has occured: 0 times in column 1
Number: 4 has occured: 0 times in column 1
Number: 5 has occured: 1 times in column 1
Number: 6 has occured: 1 times in column 1
Number: 7 has occured: 0 times in column 1
Number: 8 has occured: 0 times in column 1
Number: 9 has occured: 0 times in column 1
Selecting grid (3x3) 4 from : 20
Total numbers processed so far: 30 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 2
The current coordinate(3x3): (0,2)
Following number chosen: 2
being stored at coordinate(9x9): (3,2)
currently processing this from 3 x 3:(0,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0) 5(3,1) 2(3,2)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row3
Number: 2 has occured: 1 times in row3
Number: 3 has occured: 0 times in row3
Number: 4 has occured: 0 times in row3

Number: 5 has occured: 1 times in row3
Number: 6 has occured: 0 times in row3
Number: 7 has occured: 1 times in row3
Number: 8 has occured: 0 times in row3
Number: 9 has occured: 0 times in row3
Number: 1 has occured: 0 times in column 2
Number: 2 has occured: 1 times in column 2
Number: 3 has occured: 1 times in column 2
Number: 4 has occured: 0 times in column 2
Number: 5 has occured: 0 times in column 2
Number: 6 has occured: 0 times in column 2
Number: 7 has occured: 1 times in column 2
Number: 8 has occured: 0 times in column 2
Number: 9 has occured: 1 times in column 2
Selecting grid (3x3) 4 from : 20
Total numbers processed so far: 31 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 0
The current coordinate(3x3): (1,0)
Following number chosen: 6
being stored at coordinate(9x9): (4,0)
currently processing this from 3 x 3:(1,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0) 5(3,1) 2(3,2) 6(4,0)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 0 0 0 0 0 0
6 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row4
Number: 2 has occured: 0 times in row4
Number: 3 has occured: 0 times in row4
Number: 4 has occured: 0 times in row4
Number: 5 has occured: 0 times in row4
Number: 6 has occured: 1 times in row4
Number: 7 has occured: 0 times in row4
Number: 8 has occured: 0 times in row4
Number: 9 has occured: 0 times in row4
Number: 1 has occured: 0 times in column 0
Number: 2 has occured: 0 times in column 0
Number: 3 has occured: 0 times in column 0
Number: 4 has occured: 1 times in column 0
Number: 5 has occured: 1 times in column 0

Number: 6 has occured: 1 times in column 0
Number: 7 has occured: 1 times in column 0
Number: 8 has occured: 1 times in column 0
Number: 9 has occured: 0 times in column 0
Selecting grid (3x3) 4 from : 20
Total numbers processed so far: 32 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 1
The current coordinate(3x3): (1,1)
Following number chosen: 4
being stored at coordinate(9x9): (4,1)
currently processing this from 3 x 3:(1,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0) 5(3,1) 2(3,2) 6(4,0) 4(4,1)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 0 0 0 0 0 0
6 4 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row4
Number: 2 has occured: 0 times in row4
Number: 3 has occured: 0 times in row4
Number: 4 has occured: 1 times in row4
Number: 5 has occured: 0 times in row4
Number: 6 has occured: 1 times in row4
Number: 7 has occured: 0 times in row4
Number: 8 has occured: 0 times in row4
Number: 9 has occured: 0 times in row4
Number: 1 has occured: 1 times in column 1
Number: 2 has occured: 1 times in column 1
Number: 3 has occured: 0 times in column 1
Number: 4 has occured: 1 times in column 1
Number: 5 has occured: 1 times in column 1
Number: 6 has occured: 1 times in column 1
Number: 7 has occured: 0 times in column 1
Number: 8 has occured: 0 times in column 1
Number: 9 has occured: 0 times in column 1
Selecting grid (3x3) 4 from : 20
Total numbers processed so far: 33 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 2
The current coordinate(3x3): (1,2)
Following number chosen: 8

being stored at coordinate(9x9): (4,2)
currently processing this from 3 x 3:(1,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 0 0 0 0 0 0
6 4 8 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row4
Number: 2 has occured: 0 times in row4
Number: 3 has occured: 0 times in row4
Number: 4 has occured: 1 times in row4
Number: 5 has occured: 0 times in row4
Number: 6 has occured: 1 times in row4
Number: 7 has occured: 0 times in row4
Number: 8 has occured: 1 times in row4
Number: 9 has occured: 0 times in row4
Number: 1 has occured: 0 times in column 2
Number: 2 has occured: 1 times in column 2
Number: 3 has occured: 1 times in column 2
Number: 4 has occured: 0 times in column 2
Number: 5 has occured: 0 times in column 2
Number: 6 has occured: 0 times in column 2
Number: 7 has occured: 1 times in column 2
Number: 8 has occured: 1 times in column 2
Number: 9 has occured: 1 times in column 2
Selecting grid (3x3) 4 from : 20
Total numbers processed so far: 34 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 0
The current coordinate(3x3): (2,0)
Following number chosen: 3
being stored at coordinate(9x9): (5,0)
currently processing this from 3 x 3:(2,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 0 0 0 0 0 0

6 4 8 0 0 0 0 0 0
3 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row5
Number: 2 has occured: 0 times in row5
Number: 3 has occured: 1 times in row5
Number: 4 has occured: 0 times in row5
Number: 5 has occured: 0 times in row5
Number: 6 has occured: 0 times in row5
Number: 7 has occured: 0 times in row5
Number: 8 has occured: 0 times in row5
Number: 9 has occured: 0 times in row5
Number: 1 has occured: 0 times in column 0
Number: 2 has occured: 0 times in column 0
Number: 3 has occured: 1 times in column 0
Number: 4 has occured: 1 times in column 0
Number: 5 has occured: 1 times in column 0
Number: 6 has occured: 1 times in column 0
Number: 7 has occured: 1 times in column 0
Number: 8 has occured: 1 times in column 0
Number: 9 has occured: 0 times in column 0
Selecting grid (3x3) 4 from : 20
Total numbers processed so far: 35 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 1
The current coordinate(3x3): (2,1)
Following number chosen: 9
being stored at coordinate(9x9): (5,1)
currently processing this from 3 x 3:(2,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 0 0 0 0 0 0
6 4 8 0 0 0 0 0 0
3 9 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row5
Number: 2 has occured: 0 times in row5
Number: 3 has occured: 1 times in row5
Number: 4 has occured: 0 times in row5
Number: 5 has occured: 0 times in row5

Number: 6 has occured: 0 times in row5
Number: 7 has occured: 0 times in row5
Number: 8 has occured: 0 times in row5
Number: 9 has occured: 1 times in row5
Number: 1 has occured: 1 times in column 1
Number: 2 has occured: 1 times in column 1
Number: 3 has occured: 0 times in column 1
Number: 4 has occured: 1 times in column 1
Number: 5 has occured: 1 times in column 1
Number: 6 has occured: 1 times in column 1
Number: 7 has occured: 0 times in column 1
Number: 8 has occured: 0 times in column 1
Number: 9 has occured: 1 times in column 1
Selecting grid (3x3) 4 from : 20
Total numbers processed so far: 36 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 2
The current coordinate(3x3): (2,2)
Following number chosen: 1
being stored at coordinate(9x9): (5,2)
currently processing this from 3 x 3:(2,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 0 0 0 0 0 0
6 4 8 0 0 0 0 0 0
3 9 1 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row5
Number: 2 has occured: 0 times in row5
Number: 3 has occured: 1 times in row5
Number: 4 has occured: 0 times in row5
Number: 5 has occured: 0 times in row5
Number: 6 has occured: 0 times in row5
Number: 7 has occured: 0 times in row5
Number: 8 has occured: 0 times in row5
Number: 9 has occured: 1 times in row5
Number: 1 has occured: 1 times in column 2
Number: 2 has occured: 1 times in column 2
Number: 3 has occured: 1 times in column 2
Number: 4 has occured: 0 times in column 2
Number: 5 has occured: 0 times in column 2
Number: 6 has occured: 0 times in column 2

Number: 7 has occured: 1 times in column 2
Number: 8 has occured: 1 times in column 2
Number: 9 has occured: 1 times in column 2
****
****
Selecting grid (3x3) 5 from : 20
Total numbers processed so far: 37 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 3
The current coordinate(3x3): (0,0)
Following number chosen: 7
being stored at coordinate(9x9): (3,3)
currently processing this from 3 x 3:(0,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 0 0 0 0 0
6 4 8 0 0 0 0 0 0
3 9 1 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row3
Number: 2 has occured: 1 times in row3
Number: 3 has occured: 0 times in row3
Number: 4 has occured: 0 times in row3
Number: 5 has occured: 1 times in row3
Number: 6 has occured: 0 times in row3
Number: 7 has occured: 2 times in row3
Number: 8 has occured: 0 times in row3
Number: 9 has occured: 0 times in row3
Number: 1 has occured: 0 times in column 3
Number: 2 has occured: 0 times in column 3
Number: 3 has occured: 1 times in column 3
Number: 4 has occured: 0 times in column 3
Number: 5 has occured: 0 times in column 3
Number: 6 has occured: 0 times in column 3
Number: 7 has occured: 1 times in column 3
Number: 8 has occured: 1 times in column 3
Number: 9 has occured: 1 times in column 3
Selecting grid (3x3) 5 from : 20
Total numbers processed so far: 38 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 4
The current coordinate(3x3): (0,1)

Following number chosen: 2
being stored at coordinate(9x9): (3,4)
currently processing this from 3 x 3:(0,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 0 0 0 0
6 4 8 0 0 0 0 0 0
3 9 1 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row3
Number: 2 has occured: 2 times in row3
Number: 3 has occured: 0 times in row3
Number: 4 has occured: 0 times in row3
Number: 5 has occured: 1 times in row3
Number: 6 has occured: 0 times in row3
Number: 7 has occured: 2 times in row3
Number: 8 has occured: 0 times in row3
Number: 9 has occured: 0 times in row3
Number: 1 has occured: 1 times in column 4
Number: 2 has occured: 2 times in column 4
Number: 3 has occured: 0 times in column 4
Number: 4 has occured: 0 times in column 4
Number: 5 has occured: 0 times in column 4
Number: 6 has occured: 1 times in column 4
Number: 7 has occured: 0 times in column 4
Number: 8 has occured: 0 times in column 4
Number: 9 has occured: 0 times in column 4
Selecting grid (3x3) 5 from : 20
Total numbers processed so far: 39 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 5
The current coordinate(3x3): (0,2)
Following number chosen: 1
being stored at coordinate(9x9): (3,5)
currently processing this from 3 x 3:(0,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1

7 5 2 7 2 1 0 0 0
6 4 8 0 0 0 0 0 0
3 9 1 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row3
Number: 2 has occured: 2 times in row3
Number: 3 has occured: 0 times in row3
Number: 4 has occured: 0 times in row3
Number: 5 has occured: 1 times in row3
Number: 6 has occured: 0 times in row3
Number: 7 has occured: 2 times in row3
Number: 8 has occured: 0 times in row3
Number: 9 has occured: 0 times in row3
Number: 1 has occured: 1 times in column 5
Number: 2 has occured: 0 times in column 5
Number: 3 has occured: 0 times in column 5
Number: 4 has occured: 1 times in column 5
Number: 5 has occured: 1 times in column 5
Number: 6 has occured: 0 times in column 5
Number: 7 has occured: 1 times in column 5
Number: 8 has occured: 0 times in column 5
Number: 9 has occured: 0 times in column 5
Selecting grid (3x3) 5 from : 20
Total numbers processed so far: 40 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 3
The current coordinate(3x3): (1,0)
Following number chosen: 8
being stored at coordinate(9x9): (4,3)
currently processing this from 3 x 3:(1,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 0 0 0
6 4 8 8 0 0 0 0 0
3 9 1 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row4
Number: 2 has occured: 0 times in row4
Number: 3 has occured: 0 times in row4
Number: 4 has occured: 1 times in row4

Number: 5 has occured: 0 times in row4
Number: 6 has occured: 1 times in row4
Number: 7 has occured: 0 times in row4
Number: 8 has occured: 2 times in row4
Number: 9 has occured: 0 times in row4
Number: 1 has occured: 0 times in column 3
Number: 2 has occured: 0 times in column 3
Number: 3 has occured: 1 times in column 3
Number: 4 has occured: 0 times in column 3
Number: 5 has occured: 0 times in column 3
Number: 6 has occured: 0 times in column 3
Number: 7 has occured: 1 times in column 3
Number: 8 has occured: 2 times in column 3
Number: 9 has occured: 1 times in column 3
Selecting grid (3x3) 5 from : 20
Total numbers processed so far: 41 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 4
The current coordinate(3x3): (1,1)
Following number chosen: 4
being stored at coordinate(9x9): (4,4)
currently processing this from 3 x 3:(1,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 0 0 0
6 4 8 8 4 0 0 0 0
3 9 1 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row4
Number: 2 has occured: 0 times in row4
Number: 3 has occured: 0 times in row4
Number: 4 has occured: 2 times in row4
Number: 5 has occured: 0 times in row4
Number: 6 has occured: 1 times in row4
Number: 7 has occured: 0 times in row4
Number: 8 has occured: 2 times in row4
Number: 9 has occured: 0 times in row4
Number: 1 has occured: 1 times in column 4
Number: 2 has occured: 2 times in column 4
Number: 3 has occured: 0 times in column 4
Number: 4 has occured: 1 times in column 4
Number: 5 has occured: 0 times in column 4

Number: 6 has occured: 1 times in column 4
Number: 7 has occured: 0 times in column 4
Number: 8 has occured: 0 times in column 4
Number: 9 has occured: 0 times in column 4
Selecting grid (3x3) 5 from : 20
Total numbers processed so far: 42 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 5
The current coordinate(3x3): (1,2)
Following number chosen: 9
being stored at coordinate(9x9): (4,5)
currently processing this from 3 x 3:(1,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0) 5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 0 0 0
6 4 8 8 4 9 0 0 0
3 9 1 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row4
Number: 2 has occured: 0 times in row4
Number: 3 has occured: 0 times in row4
Number: 4 has occured: 2 times in row4
Number: 5 has occured: 0 times in row4
Number: 6 has occured: 1 times in row4
Number: 7 has occured: 0 times in row4
Number: 8 has occured: 2 times in row4
Number: 9 has occured: 1 times in row4
Number: 1 has occured: 1 times in column 5
Number: 2 has occured: 0 times in column 5
Number: 3 has occured: 0 times in column 5
Number: 4 has occured: 1 times in column 5
Number: 5 has occured: 1 times in column 5
Number: 6 has occured: 0 times in column 5
Number: 7 has occured: 1 times in column 5
Number: 8 has occured: 0 times in column 5
Number: 9 has occured: 1 times in column 5
Selecting grid (3x3) 5 from : 20
Total numbers processed so far: 43 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 3
The current coordinate(3x3): (2,0)
Following number chosen: 3

being stored at coordinate(9x9): (5,3)
currently processing this from 3 x 3:(2,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0) 5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5) 3(5,3)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 0 0 0
6 4 8 8 4 9 0 0 0
3 9 1 3 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row5
Number: 2 has occured: 0 times in row5
Number: 3 has occured: 2 times in row5
Number: 4 has occured: 0 times in row5
Number: 5 has occured: 0 times in row5
Number: 6 has occured: 0 times in row5
Number: 7 has occured: 0 times in row5
Number: 8 has occured: 0 times in row5
Number: 9 has occured: 1 times in row5
Number: 1 has occured: 0 times in column 3
Number: 2 has occured: 0 times in column 3
Number: 3 has occured: 2 times in column 3
Number: 4 has occured: 0 times in column 3
Number: 5 has occured: 0 times in column 3
Number: 6 has occured: 0 times in column 3
Number: 7 has occured: 1 times in column 3
Number: 8 has occured: 2 times in column 3
Number: 9 has occured: 1 times in column 3
Selecting grid (3x3) 5 from : 20
Total numbers processed so far: 44 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 4
The current coordinate(3x3): (2,1)
Following number chosen: 5
being stored at coordinate(9x9): (5,4)
currently processing this from 3 x 3:(2,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0) 5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5) 3(5,3) 5(5,4)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4

4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 0 0 0
6 4 8 8 4 9 0 0 0
3 9 1 3 5 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row5
Number: 2 has occured: 0 times in row5
Number: 3 has occured: 2 times in row5
Number: 4 has occured: 0 times in row5
Number: 5 has occured: 1 times in row5
Number: 6 has occured: 0 times in row5
Number: 7 has occured: 0 times in row5
Number: 8 has occured: 0 times in row5
Number: 9 has occured: 1 times in row5
Number: 1 has occured: 1 times in column 4
Number: 2 has occured: 2 times in column 4
Number: 3 has occured: 0 times in column 4
Number: 4 has occured: 1 times in column 4
Number: 5 has occured: 1 times in column 4
Number: 6 has occured: 1 times in column 4
Number: 7 has occured: 0 times in column 4
Number: 8 has occured: 0 times in column 4
Number: 9 has occured: 0 times in column 4
Selecting grid (3x3) 5 from : 20
Total numbers processed so far: 45 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 5
The current coordinate(3x3): (2,2)
Following number chosen: 6
being stored at coordinate(9x9): (5,5)
currently processing this from 3 x 3:(2,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 0 0 0
6 4 8 8 4 9 0 0 0
3 9 1 3 5 6 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row5
Number: 2 has occured: 0 times in row5

Number: 3 has occured: 2 times in row5
Number: 4 has occured: 0 times in row5
Number: 5 has occured: 1 times in row5
Number: 6 has occured: 1 times in row5
Number: 7 has occured: 0 times in row5
Number: 8 has occured: 0 times in row5
Number: 9 has occured: 1 times in row5
Number: 1 has occured: 1 times in column 5
Number: 2 has occured: 0 times in column 5
Number: 3 has occured: 0 times in column 5
Number: 4 has occured: 1 times in column 5
Number: 5 has occured: 1 times in column 5
Number: 6 has occured: 1 times in column 5
Number: 7 has occured: 1 times in column 5
Number: 8 has occured: 0 times in column 5
Number: 9 has occured: 1 times in column 5
****
****
Selecting grid (3x3) 6 from : 20
Total numbers processed so far: 46 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 6
The current coordinate(3x3): (0,0)
Following number chosen: 8
being stored at coordinate(9x9): (3,6)
currently processing this from 3 x 3:(0,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0) 5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5) 3(5,3) 5(5,4) 6(5,5) 8(3,6)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 0 0
6 4 8 8 4 9 0 0 0
3 9 1 3 5 6 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row3
Number: 2 has occured: 2 times in row3
Number: 3 has occured: 0 times in row3
Number: 4 has occured: 0 times in row3
Number: 5 has occured: 1 times in row3
Number: 6 has occured: 0 times in row3
Number: 7 has occured: 2 times in row3
Number: 8 has occured: 1 times in row3
Number: 9 has occured: 0 times in row3

Number: 1 has occured: 0 times in column 6
Number: 2 has occured: 0 times in column 6
Number: 3 has occured: 1 times in column 6
Number: 4 has occured: 0 times in column 6
Number: 5 has occured: 0 times in column 6
Number: 6 has occured: 1 times in column 6
Number: 7 has occured: 0 times in column 6
Number: 8 has occured: 2 times in column 6
Number: 9 has occured: 0 times in column 6
Selecting grid (3x3) 6 from : 20
Total numbers processed so far: 47 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 7
The current coordinate(3x3): (0,1)
Following number chosen: 5
being stored at coordinate(9x9): (3,7)
currently processing this from 3 x 3:(0,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 0
6 4 8 8 4 9 0 0 0
3 9 1 3 5 6 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row3
Number: 2 has occured: 2 times in row3
Number: 3 has occured: 0 times in row3
Number: 4 has occured: 0 times in row3
Number: 5 has occured: 2 times in row3
Number: 6 has occured: 0 times in row3
Number: 7 has occured: 2 times in row3
Number: 8 has occured: 1 times in row3
Number: 9 has occured: 0 times in row3
Number: 1 has occured: 0 times in column 7
Number: 2 has occured: 0 times in column 7
Number: 3 has occured: 0 times in column 7
Number: 4 has occured: 0 times in column 7
Number: 5 has occured: 2 times in column 7
Number: 6 has occured: 0 times in column 7
Number: 7 has occured: 1 times in column 7
Number: 8 has occured: 0 times in column 7
Number: 9 has occured: 1 times in column 7

Selecting grid (3x3) 6 from : 20
Total numbers processed so far: 48 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 8
The current coordinate(3x3): (0,2)
Following number chosen: 9
being stored at coordinate(9x9): (3,8)
currently processing this from 3 x 3:(0,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0) 5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5) 3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 0 0 0
3 9 1 3 5 6 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row3
Number: 2 has occured: 2 times in row3
Number: 3 has occured: 0 times in row3
Number: 4 has occured: 0 times in row3
Number: 5 has occured: 2 times in row3
Number: 6 has occured: 0 times in row3
Number: 7 has occured: 2 times in row3
Number: 8 has occured: 1 times in row3
Number: 9 has occured: 1 times in row3
Number: 1 has occured: 1 times in column 8
Number: 2 has occured: 1 times in column 8
Number: 3 has occured: 0 times in column 8
Number: 4 has occured: 1 times in column 8
Number: 5 has occured: 0 times in column 8
Number: 6 has occured: 0 times in column 8
Number: 7 has occured: 0 times in column 8
Number: 8 has occured: 0 times in column 8
Number: 9 has occured: 1 times in column 8
Selecting grid (3x3) 6 from : 20
Total numbers processed so far: 49 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 6
The current coordinate(3x3): (1,0)
Following number chosen: 4
being stored at coordinate(9x9): (4,6)
currently processing this from 3 x 3:(1,0)

8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 0 0
3 9 1 3 5 6 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row4
Number: 2 has occured: 0 times in row4
Number: 3 has occured: 0 times in row4
Number: 4 has occured: 3 times in row4
Number: 5 has occured: 0 times in row4
Number: 6 has occured: 1 times in row4
Number: 7 has occured: 0 times in row4
Number: 8 has occured: 2 times in row4
Number: 9 has occured: 1 times in row4
Number: 1 has occured: 0 times in column 6
Number: 2 has occured: 0 times in column 6
Number: 3 has occured: 1 times in column 6
Number: 4 has occured: 1 times in column 6
Number: 5 has occured: 0 times in column 6
Number: 6 has occured: 1 times in column 6
Number: 7 has occured: 0 times in column 6
Number: 8 has occured: 2 times in column 6
Number: 9 has occured: 0 times in column 6
Selecting grid (3x3) 6 from : 20
Total numbers processed so far: 50 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 7
The current coordinate(3x3): (1,1)
Following number chosen: 2
being stored at coordinate(9x9): (4,7)
currently processing this from 3 x 3:(1,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9

6 4 8 8 4 9 4 2 0
3 9 1 3 5 6 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row4
Number: 2 has occured: 1 times in row4
Number: 3 has occured: 0 times in row4
Number: 4 has occured: 3 times in row4
Number: 5 has occured: 0 times in row4
Number: 6 has occured: 1 times in row4
Number: 7 has occured: 0 times in row4
Number: 8 has occured: 2 times in row4
Number: 9 has occured: 1 times in row4
Number: 1 has occured: 0 times in column 7
Number: 2 has occured: 1 times in column 7
Number: 3 has occured: 0 times in column 7
Number: 4 has occured: 0 times in column 7
Number: 5 has occured: 2 times in column 7
Number: 6 has occured: 0 times in column 7
Number: 7 has occured: 1 times in column 7
Number: 8 has occured: 0 times in column 7
Number: 9 has occured: 1 times in column 7
Selecting grid (3x3) 6 from : 20
Total numbers processed so far: 51 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 8
The current coordinate(3x3): (1,2)
Following number chosen: 1
being stored at coordinate(9x9): (4,8)
currently processing this from 3 x 3:(1,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row4
Number: 2 has occured: 1 times in row4
Number: 3 has occured: 0 times in row4
Number: 4 has occured: 3 times in row4

Number: 5 has occured: 0 times in row4
Number: 6 has occured: 1 times in row4
Number: 7 has occured: 0 times in row4
Number: 8 has occured: 2 times in row4
Number: 9 has occured: 1 times in row4
Number: 1 has occured: 2 times in column 8
Number: 2 has occured: 1 times in column 8
Number: 3 has occured: 0 times in column 8
Number: 4 has occured: 1 times in column 8
Number: 5 has occured: 0 times in column 8
Number: 6 has occured: 0 times in column 8
Number: 7 has occured: 0 times in column 8
Number: 8 has occured: 0 times in column 8
Number: 9 has occured: 1 times in column 8
Selecting grid (3x3) 6 from : 20
Total numbers processed so far: 52 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 6
The current coordinate(3x3): (2,0)
Following number chosen: 7
being stored at coordinate(9x9): (5,6)
currently processing this from 3 x 3:(2,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0) 5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5) 3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row5
Number: 2 has occured: 0 times in row5
Number: 3 has occured: 2 times in row5
Number: 4 has occured: 0 times in row5
Number: 5 has occured: 1 times in row5
Number: 6 has occured: 1 times in row5
Number: 7 has occured: 1 times in row5
Number: 8 has occured: 0 times in row5
Number: 9 has occured: 1 times in row5
Number: 1 has occured: 0 times in column 6
Number: 2 has occured: 0 times in column 6
Number: 3 has occured: 1 times in column 6
Number: 4 has occured: 1 times in column 6

Number: 5 has occured: 0 times in column 6
Number: 6 has occured: 1 times in column 6
Number: 7 has occured: 1 times in column 6
Number: 8 has occured: 2 times in column 6
Number: 9 has occured: 0 times in column 6
Selecting grid (3x3) 6 from : 20
Total numbers processed so far: 53 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 7
The current coordinate(3x3): (2,1)
Following number chosen: 3
being stored at coordinate(9x9): (5,7)
currently processing this from 3 x 3:(2,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row5
Number: 2 has occured: 0 times in row5
Number: 3 has occured: 3 times in row5
Number: 4 has occured: 0 times in row5
Number: 5 has occured: 1 times in row5
Number: 6 has occured: 1 times in row5
Number: 7 has occured: 1 times in row5
Number: 8 has occured: 0 times in row5
Number: 9 has occured: 1 times in row5
Number: 1 has occured: 0 times in column 7
Number: 2 has occured: 1 times in column 7
Number: 3 has occured: 1 times in column 7
Number: 4 has occured: 0 times in column 7
Number: 5 has occured: 2 times in column 7
Number: 6 has occured: 0 times in column 7
Number: 7 has occured: 1 times in column 7
Number: 8 has occured: 0 times in column 7
Number: 9 has occured: 1 times in column 7
Selecting grid (3x3) 6 from : 20
Total numbers processed so far: 54 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 8

The current coordinate(3x3): (2,2)
Following number chosen: 6
being stored at coordinate(9x9): (5,8)
currently processing this from 3 x 3:(2,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row5
Number: 2 has occured: 0 times in row5
Number: 3 has occured: 3 times in row5
Number: 4 has occured: 0 times in row5
Number: 5 has occured: 1 times in row5
Number: 6 has occured: 2 times in row5
Number: 7 has occured: 1 times in row5
Number: 8 has occured: 0 times in row5
Number: 9 has occured: 1 times in row5
Number: 1 has occured: 2 times in column 8
Number: 2 has occured: 1 times in column 8
Number: 3 has occured: 0 times in column 8
Number: 4 has occured: 1 times in column 8
Number: 5 has occured: 0 times in column 8
Number: 6 has occured: 1 times in column 8
Number: 7 has occured: 0 times in column 8
Number: 8 has occured: 0 times in column 8
Number: 9 has occured: 1 times in column 8
****
****
Selecting grid (3x3) 7 from : 20
Total numbers processed so far: 55 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 0
The current coordinate(3x3): (0,0)
Following number chosen: 2
being stored at coordinate(9x9): (6,0)
currently processing this from 3 x 3:(0,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)

5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row6
Number: 2 has occured: 1 times in row6
Number: 3 has occured: 0 times in row6
Number: 4 has occured: 0 times in row6
Number: 5 has occured: 0 times in row6
Number: 6 has occured: 0 times in row6
Number: 7 has occured: 0 times in row6
Number: 8 has occured: 0 times in row6
Number: 9 has occured: 0 times in row6
Number: 1 has occured: 0 times in column 0
Number: 2 has occured: 1 times in column 0
Number: 3 has occured: 1 times in column 0
Number: 4 has occured: 1 times in column 0
Number: 5 has occured: 1 times in column 0
Number: 6 has occured: 1 times in column 0
Number: 7 has occured: 1 times in column 0
Number: 8 has occured: 1 times in column 0
Number: 9 has occured: 0 times in column 0
Selecting grid (3x3) 7 from : 20
Total numbers processed so far: 56 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 1
The current coordinate(3x3): (0,1)
Following number chosen: 4
being stored at coordinate(9x9): (6,1)
currently processing this from 3 x 3:(0,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6

2 4 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row6
Number: 2 has occured: 1 times in row6
Number: 3 has occured: 0 times in row6
Number: 4 has occured: 1 times in row6
Number: 5 has occured: 0 times in row6
Number: 6 has occured: 0 times in row6
Number: 7 has occured: 0 times in row6
Number: 8 has occured: 0 times in row6
Number: 9 has occured: 0 times in row6
Number: 1 has occured: 1 times in column 1
Number: 2 has occured: 1 times in column 1
Number: 3 has occured: 0 times in column 1
Number: 4 has occured: 2 times in column 1
Number: 5 has occured: 1 times in column 1
Number: 6 has occured: 1 times in column 1
Number: 7 has occured: 0 times in column 1
Number: 8 has occured: 0 times in column 1
Number: 9 has occured: 1 times in column 1
Selecting grid (3x3) 7 from : 20
Total numbers processed so far: 57 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 2
The current coordinate(3x3): (0,2)
Following number chosen: 1
being stored at coordinate(9x9): (6,2)
currently processing this from 3 x 3:(0,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
1(6,2)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row6
Number: 2 has occured: 1 times in row6
Number: 3 has occured: 0 times in row6
Number: 4 has occured: 1 times in row6
Number: 5 has occured: 0 times in row6

Number: 6 has occured: 0 times in row6
Number: 7 has occured: 0 times in row6
Number: 8 has occured: 0 times in row6
Number: 9 has occured: 0 times in row6
Number: 1 has occured: 2 times in column 2
Number: 2 has occured: 1 times in column 2
Number: 3 has occured: 1 times in column 2
Number: 4 has occured: 0 times in column 2
Number: 5 has occured: 0 times in column 2
Number: 6 has occured: 0 times in column 2
Number: 7 has occured: 1 times in column 2
Number: 8 has occured: 1 times in column 2
Number: 9 has occured: 1 times in column 2
Selecting grid (3x3) 7 from : 20
Total numbers processed so far: 58 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 0
The current coordinate(3x3): (1,0)
Following number chosen: 9
being stored at coordinate(9x9): (7,0)
currently processing this from 3 x 3:(1,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
1(6,2) 9(7,0)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 0 0 0 0 0 0
9 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row7
Number: 2 has occured: 0 times in row7
Number: 3 has occured: 0 times in row7
Number: 4 has occured: 0 times in row7
Number: 5 has occured: 0 times in row7
Number: 6 has occured: 0 times in row7
Number: 7 has occured: 0 times in row7
Number: 8 has occured: 0 times in row7
Number: 9 has occured: 1 times in row7
Number: 1 has occured: 0 times in column 0
Number: 2 has occured: 1 times in column 0
Number: 3 has occured: 1 times in column 0
Number: 4 has occured: 1 times in column 0

Number: 5 has occured: 1 times in column 0
Number: 6 has occured: 1 times in column 0
Number: 7 has occured: 1 times in column 0
Number: 8 has occured: 1 times in column 0
Number: 9 has occured: 1 times in column 0
Selecting grid (3x3) 7 from : 20
Total numbers processed so far: 59 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 1
The current coordinate(3x3): (1,1)
Following number chosen: 3
being stored at coordinate(9x9): (7,1)
currently processing this from 3 x 3:(1,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
1(6,2) 9(7,0) 3(7,1)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 0 0 0 0 0 0
9 3 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row7
Number: 2 has occured: 0 times in row7
Number: 3 has occured: 1 times in row7
Number: 4 has occured: 0 times in row7
Number: 5 has occured: 0 times in row7
Number: 6 has occured: 0 times in row7
Number: 7 has occured: 0 times in row7
Number: 8 has occured: 0 times in row7
Number: 9 has occured: 1 times in row7
Number: 1 has occured: 1 times in column 1
Number: 2 has occured: 1 times in column 1
Number: 3 has occured: 1 times in column 1
Number: 4 has occured: 2 times in column 1
Number: 5 has occured: 1 times in column 1
Number: 6 has occured: 1 times in column 1
Number: 7 has occured: 0 times in column 1
Number: 8 has occured: 0 times in column 1
Number: 9 has occured: 1 times in column 1
Selecting grid (3x3) 7 from : 20
Total numbers processed so far: 60 out of 81
Current offset in 9x9 grid: 0

Starting in this col in 9 x 9: 2
The current coordinate(3x3): (1,2)
Following number chosen: 7
being stored at coordinate(9x9): (7,2)
currently processing this from 3 x 3:(1,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
1(6,2) 9(7,0) 3(7,1) 7(7,2)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 0 0 0 0 0 0
9 3 7 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row7
Number: 2 has occured: 0 times in row7
Number: 3 has occured: 1 times in row7
Number: 4 has occured: 0 times in row7
Number: 5 has occured: 0 times in row7
Number: 6 has occured: 0 times in row7
Number: 7 has occured: 1 times in row7
Number: 8 has occured: 0 times in row7
Number: 9 has occured: 1 times in row7
Number: 1 has occured: 2 times in column 2
Number: 2 has occured: 1 times in column 2
Number: 3 has occured: 1 times in column 2
Number: 4 has occured: 0 times in column 2
Number: 5 has occured: 0 times in column 2
Number: 6 has occured: 0 times in column 2
Number: 7 has occured: 2 times in column 2
Number: 8 has occured: 1 times in column 2
Number: 9 has occured: 1 times in column 2
Selecting grid (3x3) 7 from : 20
Total numbers processed so far: 61 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 0
The current coordinate(3x3): (2,0)
Following number chosen: 8
being stored at coordinate(9x9): (8,0)
currently processing this from 3 x 3:(2,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)

3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1) 1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 0 0 0 0 0 0
9 3 7 0 0 0 0 0 0
8 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row8
Number: 2 has occured: 0 times in row8
Number: 3 has occured: 0 times in row8
Number: 4 has occured: 0 times in row8
Number: 5 has occured: 0 times in row8
Number: 6 has occured: 0 times in row8
Number: 7 has occured: 0 times in row8
Number: 8 has occured: 1 times in row8
Number: 9 has occured: 0 times in row8
Number: 1 has occured: 0 times in column 0
Number: 2 has occured: 1 times in column 0
Number: 3 has occured: 1 times in column 0
Number: 4 has occured: 1 times in column 0
Number: 5 has occured: 1 times in column 0
Number: 6 has occured: 1 times in column 0
Number: 7 has occured: 1 times in column 0
Number: 8 has occured: 2 times in column 0
Number: 9 has occured: 1 times in column 0
Selecting grid (3x3) 7 from : 20
Total numbers processed so far: 62 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 1
The current coordinate(3x3): (2,1)
Following number chosen: 6
being stored at coordinate(9x9): (8,1)
currently processing this from 3 x 3:(2,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0) 5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5) 3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1) 1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1

3 9 1 3 5 6 7 3 6
2 4 1 0 0 0 0 0 0
9 3 7 0 0 0 0 0 0
8 6 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row8
Number: 2 has occured: 0 times in row8
Number: 3 has occured: 0 times in row8
Number: 4 has occured: 0 times in row8
Number: 5 has occured: 0 times in row8
Number: 6 has occured: 1 times in row8
Number: 7 has occured: 0 times in row8
Number: 8 has occured: 1 times in row8
Number: 9 has occured: 0 times in row8
Number: 1 has occured: 1 times in column 1
Number: 2 has occured: 1 times in column 1
Number: 3 has occured: 1 times in column 1
Number: 4 has occured: 2 times in column 1
Number: 5 has occured: 1 times in column 1
Number: 6 has occured: 2 times in column 1
Number: 7 has occured: 0 times in column 1
Number: 8 has occured: 0 times in column 1
Number: 9 has occured: 1 times in column 1
Selecting grid (3x3) 7 from : 20
Total numbers processed so far: 63 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 2
The current coordinate(3x3): (2,2)
Following number chosen: 5
being stored at coordinate(9x9): (8,2)
currently processing this from 3 x 3:(2,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 0 0 0 0 0 0
9 3 7 0 0 0 0 0 0
8 6 5 0 0 0 0 0 0
Number: 1 has occured: 0 times in row8
Number: 2 has occured: 0 times in row8
Number: 3 has occured: 0 times in row8
Number: 4 has occured: 0 times in row8

Number: 5 has occured: 1 times in row8
Number: 6 has occured: 1 times in row8
Number: 7 has occured: 0 times in row8
Number: 8 has occured: 1 times in row8
Number: 9 has occured: 0 times in row8
Number: 1 has occured: 2 times in column 2
Number: 2 has occured: 1 times in column 2
Number: 3 has occured: 1 times in column 2
Number: 4 has occured: 0 times in column 2
Number: 5 has occured: 1 times in column 2
Number: 6 has occured: 0 times in column 2
Number: 7 has occured: 2 times in column 2
Number: 8 has occured: 1 times in column 2
Number: 9 has occured: 1 times in column 2
****
****
Selecting grid (3x3) 8 from : 20
Total numbers processed so far: 64 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 3
The current coordinate(3x3): (0,0)
Following number chosen: 1
being stored at coordinate(9x9): (6,3)
currently processing this from 3 x 3:(0,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0) 5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5) 3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1) 1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2) 1(6,3)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 1 0 0 0 0 0
9 3 7 0 0 0 0 0 0
8 6 5 0 0 0 0 0 0
Number: 1 has occured: 2 times in row6
Number: 2 has occured: 1 times in row6
Number: 3 has occured: 0 times in row6
Number: 4 has occured: 1 times in row6
Number: 5 has occured: 0 times in row6
Number: 6 has occured: 0 times in row6
Number: 7 has occured: 0 times in row6
Number: 8 has occured: 0 times in row6
Number: 9 has occured: 0 times in row6
Number: 1 has occured: 1 times in column 3

Number: 2 has occured: 0 times in column 3
Number: 3 has occured: 2 times in column 3
Number: 4 has occured: 0 times in column 3
Number: 5 has occured: 0 times in column 3
Number: 6 has occured: 0 times in column 3
Number: 7 has occured: 1 times in column 3
Number: 8 has occured: 2 times in column 3
Number: 9 has occured: 1 times in column 3
Selecting grid (3x3) 8 from : 20
Total numbers processed so far: 65 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 4
The current coordinate(3x3): (0,1)
Following number chosen: 3
being stored at coordinate(9x9): (6,4)
currently processing this from 3 x 3:(0,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2) 1(6,3) 3(6,4)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 1 3 0 0 0 0
9 3 7 0 0 0 0 0 0
8 6 5 0 0 0 0 0 0
Number: 1 has occured: 2 times in row6
Number: 2 has occured: 1 times in row6
Number: 3 has occured: 1 times in row6
Number: 4 has occured: 1 times in row6
Number: 5 has occured: 0 times in row6
Number: 6 has occured: 0 times in row6
Number: 7 has occured: 0 times in row6
Number: 8 has occured: 0 times in row6
Number: 9 has occured: 0 times in row6
Number: 1 has occured: 1 times in column 4
Number: 2 has occured: 2 times in column 4
Number: 3 has occured: 1 times in column 4
Number: 4 has occured: 1 times in column 4
Number: 5 has occured: 1 times in column 4
Number: 6 has occured: 1 times in column 4
Number: 7 has occured: 0 times in column 4
Number: 8 has occured: 0 times in column 4
Number: 9 has occured: 0 times in column 4

Selecting grid (3x3) 8 from : 20
Total numbers processed so far: 66 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 5
The current coordinate(3x3): (0,2)
Following number chosen: 4
being stored at coordinate(9x9): (6,5)
currently processing this from 3 x 3:(0,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2) 1(6,3) 3(6,4) 4(6,5)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 1 3 4 0 0 0
9 3 7 0 0 0 0 0 0
8 6 5 0 0 0 0 0 0
Number: 1 has occured: 2 times in row6
Number: 2 has occured: 1 times in row6
Number: 3 has occured: 1 times in row6
Number: 4 has occured: 2 times in row6
Number: 5 has occured: 0 times in row6
Number: 6 has occured: 0 times in row6
Number: 7 has occured: 0 times in row6
Number: 8 has occured: 0 times in row6
Number: 9 has occured: 0 times in row6
Number: 1 has occured: 1 times in column 5
Number: 2 has occured: 0 times in column 5
Number: 3 has occured: 0 times in column 5
Number: 4 has occured: 2 times in column 5
Number: 5 has occured: 1 times in column 5
Number: 6 has occured: 1 times in column 5
Number: 7 has occured: 1 times in column 5
Number: 8 has occured: 0 times in column 5
Number: 9 has occured: 1 times in column 5
Selecting grid (3x3) 8 from : 20
Total numbers processed so far: 67 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 3
The current coordinate(3x3): (1,0)
Following number chosen: 8
being stored at coordinate(9x9): (7,3)
currently processing this from 3 x 3:(1,0)

8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2) 1(6,3) 3(6,4) 4(6,5) 8(7,3)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 1 3 4 0 0 0
9 3 7 8 0 0 0 0 0
8 6 5 0 0 0 0 0 0
Number: 1 has occured: 0 times in row7
Number: 2 has occured: 0 times in row7
Number: 3 has occured: 1 times in row7
Number: 4 has occured: 0 times in row7
Number: 5 has occured: 0 times in row7
Number: 6 has occured: 0 times in row7
Number: 7 has occured: 1 times in row7
Number: 8 has occured: 1 times in row7
Number: 9 has occured: 1 times in row7
Number: 1 has occured: 1 times in column 3
Number: 2 has occured: 0 times in column 3
Number: 3 has occured: 2 times in column 3
Number: 4 has occured: 0 times in column 3
Number: 5 has occured: 0 times in column 3
Number: 6 has occured: 0 times in column 3
Number: 7 has occured: 1 times in column 3
Number: 8 has occured: 3 times in column 3
Number: 9 has occured: 1 times in column 3
Selecting grid (3x3) 8 from : 20
Total numbers processed so far: 68 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 4
The current coordinate(3x3): (1,1)
Following number chosen: 2
being stored at coordinate(9x9): (7,4)
currently processing this from 3 x 3:(1,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2) 1(6,3) 3(6,4) 4(6,5) 8(7,3) 2(7,4)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4

4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 1 3 4 0 0 0
9 3 7 8 2 0 0 0 0
8 6 5 0 0 0 0 0 0
Number: 1 has occured: 0 times in row7
Number: 2 has occured: 1 times in row7
Number: 3 has occured: 1 times in row7
Number: 4 has occured: 0 times in row7
Number: 5 has occured: 0 times in row7
Number: 6 has occured: 0 times in row7
Number: 7 has occured: 1 times in row7
Number: 8 has occured: 1 times in row7
Number: 9 has occured: 1 times in row7
Number: 1 has occured: 1 times in column 4
Number: 2 has occured: 3 times in column 4
Number: 3 has occured: 1 times in column 4
Number: 4 has occured: 1 times in column 4
Number: 5 has occured: 1 times in column 4
Number: 6 has occured: 1 times in column 4
Number: 7 has occured: 0 times in column 4
Number: 8 has occured: 0 times in column 4
Number: 9 has occured: 0 times in column 4
Selecting grid (3x3) 8 from : 20
Total numbers processed so far: 69 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 5
The current coordinate(3x3): (1,2)
Following number chosen: 9
being stored at coordinate(9x9): (7,5)
currently processing this from 3 x 3:(1,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2) 1(6,3) 3(6,4) 4(6,5) 8(7,3) 2(7,4) 9(7,5)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 1 3 4 0 0 0
9 3 7 8 2 9 0 0 0
8 6 5 0 0 0 0 0 0
Number: 1 has occured: 0 times in row7

Number: 2 has occured: 1 times in row7
Number: 3 has occured: 1 times in row7
Number: 4 has occured: 0 times in row7
Number: 5 has occured: 0 times in row7
Number: 6 has occured: 0 times in row7
Number: 7 has occured: 1 times in row7
Number: 8 has occured: 1 times in row7
Number: 9 has occured: 2 times in row7
Number: 1 has occured: 1 times in column 5
Number: 2 has occured: 0 times in column 5
Number: 3 has occured: 0 times in column 5
Number: 4 has occured: 2 times in column 5
Number: 5 has occured: 1 times in column 5
Number: 6 has occured: 1 times in column 5
Number: 7 has occured: 1 times in column 5
Number: 8 has occured: 0 times in column 5
Number: 9 has occured: 2 times in column 5
Selecting grid (3x3) 8 from : 20
Total numbers processed so far: 70 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 3
The current coordinate(3x3): (2,0)
Following number chosen: 5
being stored at coordinate(9x9): (8,3)
currently processing this from 3 x 3:(2,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2) 1(6,3) 3(6,4) 4(6,5) 8(7,3) 2(7,4) 9(7,5) 5(8,3)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 1 3 4 0 0 0
9 3 7 8 2 9 0 0 0
8 6 5 5 0 0 0 0 0
Number: 1 has occured: 0 times in row8
Number: 2 has occured: 0 times in row8
Number: 3 has occured: 0 times in row8
Number: 4 has occured: 0 times in row8
Number: 5 has occured: 2 times in row8
Number: 6 has occured: 1 times in row8
Number: 7 has occured: 0 times in row8
Number: 8 has occured: 1 times in row8
Number: 9 has occured: 0 times in row8

Number: 1 has occured: 1 times in column 3
Number: 2 has occured: 0 times in column 3
Number: 3 has occured: 2 times in column 3
Number: 4 has occured: 0 times in column 3
Number: 5 has occured: 1 times in column 3
Number: 6 has occured: 0 times in column 3
Number: 7 has occured: 1 times in column 3
Number: 8 has occured: 3 times in column 3
Number: 9 has occured: 1 times in column 3
Selecting grid (3x3) 8 from : 20
Total numbers processed so far: 71 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 4
The current coordinate(3x3): (2,1)
Following number chosen: 7
being stored at coordinate(9x9): (8,4)
currently processing this from 3 x 3:(2,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0) 5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5) 3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1) 1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2) 1(6,3) 3(6,4) 4(6,5) 8(7,3) 2(7,4) 9(7,5) 5(8,3) 7(8,4)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 1 3 4 0 0 0
9 3 7 8 2 9 0 0 0
8 6 5 5 7 0 0 0 0
Number: 1 has occured: 0 times in row8
Number: 2 has occured: 0 times in row8
Number: 3 has occured: 0 times in row8
Number: 4 has occured: 0 times in row8
Number: 5 has occured: 2 times in row8
Number: 6 has occured: 1 times in row8
Number: 7 has occured: 1 times in row8
Number: 8 has occured: 1 times in row8
Number: 9 has occured: 0 times in row8
Number: 1 has occured: 1 times in column 4
Number: 2 has occured: 3 times in column 4
Number: 3 has occured: 1 times in column 4
Number: 4 has occured: 1 times in column 4
Number: 5 has occured: 1 times in column 4
Number: 6 has occured: 1 times in column 4
Number: 7 has occured: 1 times in column 4

Number: 8 has occured: 0 times in column 4
Number: 9 has occured: 0 times in column 4
Selecting grid (3x3) 8 from : 20
Total numbers processed so far: 72 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 5
The current coordinate(3x3): (2,2)
Following number chosen: 6
being stored at coordinate(9x9): (8,5)
currently processing this from 3 x 3:(2,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0) 5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5) 3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1) 1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2) 1(6,3) 3(6,4) 4(6,5) 8(7,3) 2(7,4) 9(7,5) 5(8,3) 7(8,4) 6(8,5)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 1 3 4 0 0 0
9 3 7 8 2 9 0 0 0
8 6 5 5 7 6 0 0 0
Number: 1 has occured: 0 times in row8
Number: 2 has occured: 0 times in row8
Number: 3 has occured: 0 times in row8
Number: 4 has occured: 0 times in row8
Number: 5 has occured: 2 times in row8
Number: 6 has occured: 2 times in row8
Number: 7 has occured: 1 times in row8
Number: 8 has occured: 1 times in row8
Number: 9 has occured: 0 times in row8
Number: 1 has occured: 1 times in column 5
Number: 2 has occured: 0 times in column 5
Number: 3 has occured: 0 times in column 5
Number: 4 has occured: 2 times in column 5
Number: 5 has occured: 1 times in column 5
Number: 6 has occured: 2 times in column 5
Number: 7 has occured: 1 times in column 5
Number: 8 has occured: 0 times in column 5
Number: 9 has occured: 2 times in column 5
****
****
Selecting grid (3x3) 9 from : 20
Total numbers processed so far: 73 out of 81
Current offset in 9x9 grid: 6

Starting in this col in 9 x 9: 6
The current coordinate(3x3): (0,0)
Following number chosen: 1
being stored at coordinate(9x9): (6,6)
currently processing this from 3 x 3:(0,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2) 1(6,3) 3(6,4) 4(6,5) 8(7,3) 2(7,4) 9(7,5) 5(8,3)
7(8,4) 6(8,5) 1(6,6)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 1 3 4 1 0 0
9 3 7 8 2 9 0 0 0
8 6 5 5 7 6 0 0 0
Number: 1 has occured: 3 times in row6
Number: 2 has occured: 1 times in row6
Number: 3 has occured: 1 times in row6
Number: 4 has occured: 2 times in row6
Number: 5 has occured: 0 times in row6
Number: 6 has occured: 0 times in row6
Number: 7 has occured: 0 times in row6
Number: 8 has occured: 0 times in row6
Number: 9 has occured: 0 times in row6
Number: 1 has occured: 1 times in column 6
Number: 2 has occured: 0 times in column 6
Number: 3 has occured: 1 times in column 6
Number: 4 has occured: 1 times in column 6
Number: 5 has occured: 0 times in column 6
Number: 6 has occured: 1 times in column 6
Number: 7 has occured: 1 times in column 6
Number: 8 has occured: 2 times in column 6
Number: 9 has occured: 0 times in column 6
Selecting grid (3x3) 9 from : 20
Total numbers processed so far: 74 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 7
The current coordinate(3x3): (0,1)
Following number chosen: 8
being stored at coordinate(9x9): (6,7)
currently processing this from 3 x 3:(0,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)

5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2) 1(6,3) 3(6,4) 4(6,5) 8(7,3) 2(7,4) 9(7,5) 5(8,3)
7(8,4) 6(8,5) 1(6,6) 8(6,7)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 1 3 4 1 8 0
9 3 7 8 2 9 0 0 0
8 6 5 5 7 6 0 0 0
Number: 1 has occured: 3 times in row6
Number: 2 has occured: 1 times in row6
Number: 3 has occured: 1 times in row6
Number: 4 has occured: 2 times in row6
Number: 5 has occured: 0 times in row6
Number: 6 has occured: 0 times in row6
Number: 7 has occured: 0 times in row6
Number: 8 has occured: 1 times in row6
Number: 9 has occured: 0 times in row6
Number: 1 has occured: 0 times in column 7
Number: 2 has occured: 1 times in column 7
Number: 3 has occured: 1 times in column 7
Number: 4 has occured: 0 times in column 7
Number: 5 has occured: 2 times in column 7
Number: 6 has occured: 0 times in column 7
Number: 7 has occured: 1 times in column 7
Number: 8 has occured: 1 times in column 7
Number: 9 has occured: 1 times in column 7
Selecting grid (3x3) 9 from : 20
Total numbers processed so far: 75 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 8
The current coordinate(3x3): (0,2)
Following number chosen: 5
being stored at coordinate(9x9): (6,8)
currently processing this from 3 x 3:(0,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2) 1(6,3) 3(6,4) 4(6,5) 8(7,3) 2(7,4) 9(7,5) 5(8,3)
7(8,4) 6(8,5) 1(6,6) 8(6,7) 5(6,8)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4

4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 1 3 4 1 8 5
9 3 7 8 2 9 0 0 0
8 6 5 5 7 6 0 0 0
Number: 1 has occured: 3 times in row6
Number: 2 has occured: 1 times in row6
Number: 3 has occured: 1 times in row6
Number: 4 has occured: 2 times in row6
Number: 5 has occured: 1 times in row6
Number: 6 has occured: 0 times in row6
Number: 7 has occured: 0 times in row6
Number: 8 has occured: 1 times in row6
Number: 9 has occured: 0 times in row6
Number: 1 has occured: 2 times in column 8
Number: 2 has occured: 1 times in column 8
Number: 3 has occured: 0 times in column 8
Number: 4 has occured: 1 times in column 8
Number: 5 has occured: 1 times in column 8
Number: 6 has occured: 1 times in column 8
Number: 7 has occured: 0 times in column 8
Number: 8 has occured: 0 times in column 8
Number: 9 has occured: 1 times in column 8
Selecting grid (3x3) 9 from : 20
Total numbers processed so far: 76 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 6
The current coordinate(3x3): (1,0)
Following number chosen: 6
being stored at coordinate(9x9): (7,6)
currently processing this from 3 x 3:(1,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2) 1(6,3) 3(6,4) 4(6,5) 8(7,3) 2(7,4) 9(7,5) 5(8,3)
7(8,4) 6(8,5) 1(6,6) 8(6,7) 5(6,8) 6(7,6)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 1 3 4 1 8 5
9 3 7 8 2 9 6 0 0
8 6 5 5 7 6 0 0 0

Number: 1 has occured: 0 times in row7
Number: 2 has occured: 1 times in row7
Number: 3 has occured: 1 times in row7
Number: 4 has occured: 0 times in row7
Number: 5 has occured: 0 times in row7
Number: 6 has occured: 1 times in row7
Number: 7 has occured: 1 times in row7
Number: 8 has occured: 1 times in row7
Number: 9 has occured: 2 times in row7
Number: 1 has occured: 1 times in column 6
Number: 2 has occured: 0 times in column 6
Number: 3 has occured: 1 times in column 6
Number: 4 has occured: 1 times in column 6
Number: 5 has occured: 0 times in column 6
Number: 6 has occured: 2 times in column 6
Number: 7 has occured: 1 times in column 6
Number: 8 has occured: 2 times in column 6
Number: 9 has occured: 0 times in column 6
Selecting grid (3x3) 9 from : 20
Total numbers processed so far: 77 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 7
The current coordinate(3x3): (1,1)
Following number chosen: 9
being stored at coordinate(9x9): (7,7)
currently processing this from 3 x 3:(1,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2) 1(6,3) 3(6,4) 4(6,5) 8(7,3) 2(7,4) 9(7,5) 5(8,3)
7(8,4) 6(8,5) 1(6,6) 8(6,7) 5(6,8) 6(7,6) 9(7,7)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 1 3 4 1 8 5
9 3 7 8 2 9 6 9 0
8 6 5 5 7 6 0 0 0
Number: 1 has occured: 0 times in row7
Number: 2 has occured: 1 times in row7
Number: 3 has occured: 1 times in row7
Number: 4 has occured: 0 times in row7
Number: 5 has occured: 0 times in row7
Number: 6 has occured: 1 times in row7
Number: 7 has occured: 1 times in row7

Number: 8 has occured: 1 times in row7
Number: 9 has occured: 3 times in row7
Number: 1 has occured: 0 times in column 7
Number: 2 has occured: 1 times in column 7
Number: 3 has occured: 1 times in column 7
Number: 4 has occured: 0 times in column 7
Number: 5 has occured: 2 times in column 7
Number: 6 has occured: 0 times in column 7
Number: 7 has occured: 1 times in column 7
Number: 8 has occured: 1 times in column 7
Number: 9 has occured: 2 times in column 7
Selecting grid (3x3) 9 from : 20
Total numbers processed so far: 78 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 8
The current coordinate(3x3): (1,2)
Following number chosen: 2
being stored at coordinate(9x9): (7,8)
currently processing this from 3 x 3:(1,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2) 1(6,3) 3(6,4) 4(6,5) 8(7,3) 2(7,4) 9(7,5) 5(8,3)
7(8,4) 6(8,5) 1(6,6) 8(6,7) 5(6,8) 6(7,6) 9(7,7) 2(7,8)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 1 3 4 1 8 5
9 3 7 8 2 9 6 9 2
8 6 5 5 7 6 0 0 0
Number: 1 has occured: 0 times in row7
Number: 2 has occured: 2 times in row7
Number: 3 has occured: 1 times in row7
Number: 4 has occured: 0 times in row7
Number: 5 has occured: 0 times in row7
Number: 6 has occured: 1 times in row7
Number: 7 has occured: 1 times in row7
Number: 8 has occured: 1 times in row7
Number: 9 has occured: 3 times in row7
Number: 1 has occured: 2 times in column 8
Number: 2 has occured: 2 times in column 8
Number: 3 has occured: 0 times in column 8
Number: 4 has occured: 1 times in column 8
Number: 5 has occured: 1 times in column 8

Number: 6 has occured: 1 times in column 8
Number: 7 has occured: 0 times in column 8
Number: 8 has occured: 0 times in column 8
Number: 9 has occured: 1 times in column 8
Selecting grid (3x3) 9 from : 20
Total numbers processed so far: 79 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 6
The current coordinate(3x3): (2,0)
Following number chosen: 7
being stored at coordinate(9x9): (8,6)
currently processing this from 3 x 3:(2,0)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2) 1(6,3) 3(6,4) 4(6,5) 8(7,3) 2(7,4) 9(7,5) 5(8,3)
7(8,4) 6(8,5) 1(6,6) 8(6,7) 5(6,8) 6(7,6) 9(7,7) 2(7,8) 7(8,6)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 1 3 4 1 8 5
9 3 7 8 2 9 6 9 2
8 6 5 5 7 6 7 0 0
Number: 1 has occured: 0 times in row8
Number: 2 has occured: 0 times in row8
Number: 3 has occured: 0 times in row8
Number: 4 has occured: 0 times in row8
Number: 5 has occured: 2 times in row8
Number: 6 has occured: 2 times in row8
Number: 7 has occured: 2 times in row8
Number: 8 has occured: 1 times in row8
Number: 9 has occured: 0 times in row8
Number: 1 has occured: 1 times in column 6
Number: 2 has occured: 0 times in column 6
Number: 3 has occured: 1 times in column 6
Number: 4 has occured: 1 times in column 6
Number: 5 has occured: 0 times in column 6
Number: 6 has occured: 2 times in column 6
Number: 7 has occured: 2 times in column 6
Number: 8 has occured: 2 times in column 6
Number: 9 has occured: 0 times in column 6
Selecting grid (3x3) 9 from : 20
Total numbers processed so far: 80 out of 81
Current offset in 9x9 grid: 6

Starting in this col in 9 x 9: 7
The current coordinate(3x3): (2,1)
Following number chosen: 4
being stored at coordinate(9x9): (8,7)
currently processing this from 3 x 3:(2,1)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)
5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5)
3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1)
1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2) 1(6,3) 3(6,4) 4(6,5) 8(7,3) 2(7,4) 9(7,5) 5(8,3)
7(8,4) 6(8,5) 1(6,6) 8(6,7) 5(6,8) 6(7,6) 9(7,7) 2(7,8) 7(8,6) 4(8,7)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 1 3 4 1 8 5
9 3 7 8 2 9 6 9 2
8 6 5 5 7 6 7 4 0
Number: 1 has occured: 0 times in row8
Number: 2 has occured: 0 times in row8
Number: 3 has occured: 0 times in row8
Number: 4 has occured: 1 times in row8
Number: 5 has occured: 2 times in row8
Number: 6 has occured: 2 times in row8
Number: 7 has occured: 2 times in row8
Number: 8 has occured: 1 times in row8
Number: 9 has occured: 0 times in row8
Number: 1 has occured: 0 times in column 7
Number: 2 has occured: 1 times in column 7
Number: 3 has occured: 1 times in column 7
Number: 4 has occured: 1 times in column 7
Number: 5 has occured: 2 times in column 7
Number: 6 has occured: 0 times in column 7
Number: 7 has occured: 1 times in column 7
Number: 8 has occured: 1 times in column 7
Number: 9 has occured: 2 times in column 7
Selecting grid (3x3) 9 from : 20
Total numbers processed so far: 81 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 8
The current coordinate(3x3): (2,2)
Following number chosen: 3
being stored at coordinate(9x9): (8,8)
currently processing this from 3 x 3:(2,2)
8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4)
5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0)

5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5) 3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1) 1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2) 1(6,3) 3(6,4) 4(6,5) 8(7,3) 2(7,4) 9(7,5) 5(8,3) 7(8,4) 6(8,5) 1(6,6) 8(6,7) 5(6,8) 6(7,6) 9(7,7) 2(7,8) 7(8,6) 4(8,7) 3(8,8)
FILLING BOARD
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 1 3 4 1 8 5
9 3 7 8 2 9 6 9 2
8 6 5 5 7 6 7 4 3
Number: 1 has occured: 0 times in row8
Number: 2 has occured: 0 times in row8
Number: 3 has occured: 1 times in row8
Number: 4 has occured: 1 times in row8
Number: 5 has occured: 2 times in row8
Number: 6 has occured: 2 times in row8
Number: 7 has occured: 2 times in row8
Number: 8 has occured: 1 times in row8
Number: 9 has occured: 0 times in row8
Number: 1 has occured: 2 times in column 8
Number: 2 has occured: 2 times in column 8
Number: 3 has occured: 1 times in column 8
Number: 4 has occured: 1 times in column 8
Number: 5 has occured: 1 times in column 8
Number: 6 has occured: 1 times in column 8
Number: 7 has occured: 0 times in column 8
Number: 8 has occured: 0 times in column 8
Number: 9 has occured: 1 times in column 8

This is your board number 1 summary: 8(0,0) 2(0,1) 9(0,2) 5(1,0) 1(1,1) 7(1,2) 4(2,0) 6(2,1) 3(2,2) 8(0,3) 1(0,4) 4(0,5) 3(1,3) 6(1,4) 5(1,5) 9(2,3) 2(2,4) 7(2,5) 3(0,6) 7(0,7) 2(0,8) 8(1,6) 9(1,7) 4(1,8) 6(2,6) 5(2,7) 1(2,8) 7(3,0) 5(3,1) 2(3,2) 6(4,0) 4(4,1) 8(4,2) 3(5,0) 9(5,1) 1(5,2) 7(3,3) 2(3,4) 1(3,5) 8(4,3) 4(4,4) 9(4,5) 3(5,3) 5(5,4) 6(5,5) 8(3,6) 5(3,7) 9(3,8) 4(4,6) 2(4,7) 1(4,8) 7(5,6) 3(5,7) 6(5,8) 2(6,0) 4(6,1) 1(6,2) 9(7,0) 3(7,1) 7(7,2) 8(8,0) 6(8,1) 5(8,2) 1(6,3) 3(6,4) 4(6,5) 8(7,3) 2(7,4) 9(7,5) 5(8,3) 7(8,4) 6(8,5) 1(6,6) 8(6,7) 5(6,8) 6(7,6) 9(7,7) 2(7,8) 7(8,6) 4(8,7) 3(8,8)
****
Better luck next time, failed on board: 1
8 2 9 8 1 4 3 7 2
5 1 7 3 6 5 8 9 4
4 6 3 9 2 7 6 5 1
7 5 2 7 2 1 8 5 9
6 4 8 8 4 9 4 2 1
3 9 1 3 5 6 7 3 6
2 4 1 1 3 4 1 8 5

9 3 7 8 2 9 6 9 2
8 6 5 5 7 6 7 4 3
****

Moving onto Board Number: 2
****
****
Selecting grid (3x3) 1 from : 20
Total numbers processed so far: 1 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 0
The current coordinate(3x3): (0,0)
Following number chosen: 4
being stored at coordinate(9x9): (0,0)
currently processing this from 3 x 3:(0,0)
4(0,0)
FILLING BOARD
4 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row0
Number: 2 has occured: 0 times in row0
Number: 3 has occured: 0 times in row0
Number: 4 has occured: 1 times in row0
Number: 5 has occured: 0 times in row0
Number: 6 has occured: 0 times in row0
Number: 7 has occured: 0 times in row0
Number: 8 has occured: 0 times in row0
Number: 9 has occured: 0 times in row0
Number: 1 has occured: 0 times in column 0
Number: 2 has occured: 0 times in column 0
Number: 3 has occured: 0 times in column 0
Number: 4 has occured: 1 times in column 0
Number: 5 has occured: 0 times in column 0
Number: 6 has occured: 0 times in column 0
Number: 7 has occured: 0 times in column 0
Number: 8 has occured: 0 times in column 0
Number: 9 has occured: 0 times in column 0
Selecting grid (3x3) 1 from : 20
Total numbers processed so far: 2 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 1

The current coordinate(3x3): (0,1)
Following number chosen: 3
being stored at coordinate(9x9): (0,1)
currently processing this from 3 x 3:(0,1)
4(0,0) 3(0,1)
FILLING BOARD
4 3 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row0
Number: 2 has occured: 0 times in row0
Number: 3 has occured: 1 times in row0
Number: 4 has occured: 1 times in row0
Number: 5 has occured: 0 times in row0
Number: 6 has occured: 0 times in row0
Number: 7 has occured: 0 times in row0
Number: 8 has occured: 0 times in row0
Number: 9 has occured: 0 times in row0
Number: 1 has occured: 0 times in column 1
Number: 2 has occured: 0 times in column 1
Number: 3 has occured: 1 times in column 1
Number: 4 has occured: 0 times in column 1
Number: 5 has occured: 0 times in column 1
Number: 6 has occured: 0 times in column 1
Number: 7 has occured: 0 times in column 1
Number: 8 has occured: 0 times in column 1
Number: 9 has occured: 0 times in column 1
Selecting grid (3x3) 1 from : 20
Total numbers processed so far: 3 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 2
The current coordinate(3x3): (0,2)
Following number chosen: 8
being stored at coordinate(9x9): (0,2)
currently processing this from 3 x 3:(0,2)
4(0,0) 3(0,1) 8(0,2)
FILLING BOARD
4 3 8 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row0
Number: 2 has occured: 0 times in row0
Number: 3 has occured: 1 times in row0
Number: 4 has occured: 1 times in row0
Number: 5 has occured: 0 times in row0
Number: 6 has occured: 0 times in row0
Number: 7 has occured: 0 times in row0
Number: 8 has occured: 1 times in row0
Number: 9 has occured: 0 times in row0
Number: 1 has occured: 0 times in column 2
Number: 2 has occured: 0 times in column 2
Number: 3 has occured: 0 times in column 2
Number: 4 has occured: 0 times in column 2
Number: 5 has occured: 0 times in column 2
Number: 6 has occured: 0 times in column 2
Number: 7 has occured: 0 times in column 2
Number: 8 has occured: 1 times in column 2
Number: 9 has occured: 0 times in column 2
Selecting grid (3x3) 1 from : 20
Total numbers processed so far: 4 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 0
The current coordinate(3x3): (1,0)
Following number chosen: 1
being stored at coordinate(9x9): (1,0)
currently processing this from 3 x 3:(1,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0)
FILLING BOARD
4 3 8 0 0 0 0 0 0
1 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row1
Number: 2 has occured: 0 times in row1
Number: 3 has occured: 0 times in row1
Number: 4 has occured: 0 times in row1
Number: 5 has occured: 0 times in row1
Number: 6 has occured: 0 times in row1
Number: 7 has occured: 0 times in row1
Number: 8 has occured: 0 times in row1
Number: 9 has occured: 0 times in row1

Number: 1 has occured: 1 times in column 0
Number: 2 has occured: 0 times in column 0
Number: 3 has occured: 0 times in column 0
Number: 4 has occured: 1 times in column 0
Number: 5 has occured: 0 times in column 0
Number: 6 has occured: 0 times in column 0
Number: 7 has occured: 0 times in column 0
Number: 8 has occured: 0 times in column 0
Number: 9 has occured: 0 times in column 0
Selecting grid (3x3) 1 from : 20
Total numbers processed so far: 5 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 1
The current coordinate(3x3): (1,1)
Following number chosen: 7
being stored at coordinate(9x9): (1,1)
currently processing this from 3 x 3:(1,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1)
FILLING BOARD
4 3 8 0 0 0 0 0 0
1 7 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row1
Number: 2 has occured: 0 times in row1
Number: 3 has occured: 0 times in row1
Number: 4 has occured: 0 times in row1
Number: 5 has occured: 0 times in row1
Number: 6 has occured: 0 times in row1
Number: 7 has occured: 1 times in row1
Number: 8 has occured: 0 times in row1
Number: 9 has occured: 0 times in row1
Number: 1 has occured: 0 times in column 1
Number: 2 has occured: 0 times in column 1
Number: 3 has occured: 1 times in column 1
Number: 4 has occured: 0 times in column 1
Number: 5 has occured: 0 times in column 1
Number: 6 has occured: 0 times in column 1
Number: 7 has occured: 1 times in column 1
Number: 8 has occured: 0 times in column 1
Number: 9 has occured: 0 times in column 1
Selecting grid (3x3) 1 from : 20
Total numbers processed so far: 6 out of 81
Current offset in 9x9 grid: 0

Starting in this col in 9 x 9: 2
The current coordinate(3x3): (1,2)
Following number chosen: 5
being stored at coordinate(9x9): (1,2)
currently processing this from 3 x 3:(1,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2)
FILLING BOARD
4 3 8 0 0 0 0 0 0
1 7 5 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row1
Number: 2 has occured: 0 times in row1
Number: 3 has occured: 0 times in row1
Number: 4 has occured: 0 times in row1
Number: 5 has occured: 1 times in row1
Number: 6 has occured: 0 times in row1
Number: 7 has occured: 1 times in row1
Number: 8 has occured: 0 times in row1
Number: 9 has occured: 0 times in row1
Number: 1 has occured: 0 times in column 2
Number: 2 has occured: 0 times in column 2
Number: 3 has occured: 0 times in column 2
Number: 4 has occured: 0 times in column 2
Number: 5 has occured: 1 times in column 2
Number: 6 has occured: 0 times in column 2
Number: 7 has occured: 0 times in column 2
Number: 8 has occured: 1 times in column 2
Number: 9 has occured: 0 times in column 2
Selecting grid (3x3) 1 from : 20
Total numbers processed so far: 7 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 0
The current coordinate(3x3): (2,0)
Following number chosen: 2
being stored at coordinate(9x9): (2,0)
currently processing this from 3 x 3:(2,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0)
FILLING BOARD
4 3 8 0 0 0 0 0 0
1 7 5 0 0 0 0 0 0
2 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row2
Number: 2 has occured: 1 times in row2
Number: 3 has occured: 0 times in row2
Number: 4 has occured: 0 times in row2
Number: 5 has occured: 0 times in row2
Number: 6 has occured: 0 times in row2
Number: 7 has occured: 0 times in row2
Number: 8 has occured: 0 times in row2
Number: 9 has occured: 0 times in row2
Number: 1 has occured: 1 times in column 0
Number: 2 has occured: 1 times in column 0
Number: 3 has occured: 0 times in column 0
Number: 4 has occured: 1 times in column 0
Number: 5 has occured: 0 times in column 0
Number: 6 has occured: 0 times in column 0
Number: 7 has occured: 0 times in column 0
Number: 8 has occured: 0 times in column 0
Number: 9 has occured: 0 times in column 0
Selecting grid (3x3) 1 from : 20
Total numbers processed so far: 8 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 1
The current coordinate(3x3): (2,1)
Following number chosen: 6
being stored at coordinate(9x9): (2,1)
currently processing this from 3 x 3:(2,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1)
FILLING BOARD
4 3 8 0 0 0 0 0 0
1 7 5 0 0 0 0 0 0
2 6 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row2
Number: 2 has occured: 1 times in row2
Number: 3 has occured: 0 times in row2
Number: 4 has occured: 0 times in row2
Number: 5 has occured: 0 times in row2
Number: 6 has occured: 1 times in row2
Number: 7 has occured: 0 times in row2
Number: 8 has occured: 0 times in row2

Number: 9 has occured: 0 times in row2
Number: 1 has occured: 0 times in column 1
Number: 2 has occured: 0 times in column 1
Number: 3 has occured: 1 times in column 1
Number: 4 has occured: 0 times in column 1
Number: 5 has occured: 0 times in column 1
Number: 6 has occured: 1 times in column 1
Number: 7 has occured: 1 times in column 1
Number: 8 has occured: 0 times in column 1
Number: 9 has occured: 0 times in column 1
Selecting grid (3x3) 1 from : 20
Total numbers processed so far: 9 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 2
The current coordinate(3x3): (2,2)
Following number chosen: 9
being stored at coordinate(9x9): (2,2)
currently processing this from 3 x 3:(2,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2)
FILLING BOARD
4 3 8 0 0 0 0 0 0
1 7 5 0 0 0 0 0 0
2 6 9 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row2
Number: 2 has occured: 1 times in row2
Number: 3 has occured: 0 times in row2
Number: 4 has occured: 0 times in row2
Number: 5 has occured: 0 times in row2
Number: 6 has occured: 1 times in row2
Number: 7 has occured: 0 times in row2
Number: 8 has occured: 0 times in row2
Number: 9 has occured: 1 times in row2
Number: 1 has occured: 0 times in column 2
Number: 2 has occured: 0 times in column 2
Number: 3 has occured: 0 times in column 2
Number: 4 has occured: 0 times in column 2
Number: 5 has occured: 1 times in column 2
Number: 6 has occured: 0 times in column 2
Number: 7 has occured: 0 times in column 2
Number: 8 has occured: 1 times in column 2
Number: 9 has occured: 1 times in column 2
****
****

Selecting grid (3x3) 2 from : 20
Total numbers processed so far: 10 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 3
The current coordinate(3x3): (0,0)
Following number chosen: 1
being stored at coordinate(9x9): (0,3)
currently processing this from 3 x 3:(0,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3)
FILLING BOARD
4 3 8 1 0 0 0 0 0
1 7 5 0 0 0 0 0 0
2 6 9 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row0
Number: 2 has occured: 0 times in row0
Number: 3 has occured: 1 times in row0
Number: 4 has occured: 1 times in row0
Number: 5 has occured: 0 times in row0
Number: 6 has occured: 0 times in row0
Number: 7 has occured: 0 times in row0
Number: 8 has occured: 1 times in row0
Number: 9 has occured: 0 times in row0
Number: 1 has occured: 1 times in column 3
Number: 2 has occured: 0 times in column 3
Number: 3 has occured: 0 times in column 3
Number: 4 has occured: 0 times in column 3
Number: 5 has occured: 0 times in column 3
Number: 6 has occured: 0 times in column 3
Number: 7 has occured: 0 times in column 3
Number: 8 has occured: 0 times in column 3
Number: 9 has occured: 0 times in column 3
Selecting grid (3x3) 2 from : 20
Total numbers processed so far: 11 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 4
The current coordinate(3x3): (0,1)
Following number chosen: 5
being stored at coordinate(9x9): (0,4)
currently processing this from 3 x 3:(0,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4)
FILLING BOARD
4 3 8 1 5 0 0 0 0
1 7 5 0 0 0 0 0 0

2 6 9 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row0
Number: 2 has occured: 0 times in row0
Number: 3 has occured: 1 times in row0
Number: 4 has occured: 1 times in row0
Number: 5 has occured: 1 times in row0
Number: 6 has occured: 0 times in row0
Number: 7 has occured: 0 times in row0
Number: 8 has occured: 1 times in row0
Number: 9 has occured: 0 times in row0
Number: 1 has occured: 0 times in column 4
Number: 2 has occured: 0 times in column 4
Number: 3 has occured: 0 times in column 4
Number: 4 has occured: 0 times in column 4
Number: 5 has occured: 1 times in column 4
Number: 6 has occured: 0 times in column 4
Number: 7 has occured: 0 times in column 4
Number: 8 has occured: 0 times in column 4
Number: 9 has occured: 0 times in column 4
Selecting grid (3x3) 2 from : 20
Total numbers processed so far: 12 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 5
The current coordinate(3x3): (0,2)
Following number chosen: 2
being stored at coordinate(9x9): (0,5)
currently processing this from 3 x 3:(0,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5)
FILLING BOARD
4 3 8 1 5 2 0 0 0
1 7 5 0 0 0 0 0 0
2 6 9 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row0
Number: 2 has occured: 1 times in row0
Number: 3 has occured: 1 times in row0
Number: 4 has occured: 1 times in row0
Number: 5 has occured: 1 times in row0

Number: 6 has occured: 0 times in row0
Number: 7 has occured: 0 times in row0
Number: 8 has occured: 1 times in row0
Number: 9 has occured: 0 times in row0
Number: 1 has occured: 0 times in column 5
Number: 2 has occured: 1 times in column 5
Number: 3 has occured: 0 times in column 5
Number: 4 has occured: 0 times in column 5
Number: 5 has occured: 0 times in column 5
Number: 6 has occured: 0 times in column 5
Number: 7 has occured: 0 times in column 5
Number: 8 has occured: 0 times in column 5
Number: 9 has occured: 0 times in column 5
Selecting grid (3x3) 2 from : 20
Total numbers processed so far: 13 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 3
The current coordinate(3x3): (1,0)
Following number chosen: 3
being stored at coordinate(9x9): (1,3)
currently processing this from 3 x 3:(1,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3)
FILLING BOARD
4 3 8 1 5 2 0 0 0
1 7 5 3 0 0 0 0 0
2 6 9 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row1
Number: 2 has occured: 0 times in row1
Number: 3 has occured: 1 times in row1
Number: 4 has occured: 0 times in row1
Number: 5 has occured: 1 times in row1
Number: 6 has occured: 0 times in row1
Number: 7 has occured: 1 times in row1
Number: 8 has occured: 0 times in row1
Number: 9 has occured: 0 times in row1
Number: 1 has occured: 1 times in column 3
Number: 2 has occured: 0 times in column 3
Number: 3 has occured: 1 times in column 3
Number: 4 has occured: 0 times in column 3
Number: 5 has occured: 0 times in column 3
Number: 6 has occured: 0 times in column 3
Number: 7 has occured: 0 times in column 3
Number: 8 has occured: 0 times in column 3

Number: 9 has occured: 0 times in column 3
Selecting grid (3x3) 2 from : 20
Total numbers processed so far: 14 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 4
The current coordinate(3x3): (1,1)
Following number chosen: 9
being stored at coordinate(9x9): (1,4)
currently processing this from 3 x 3:(1,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
FILLING BOARD
4 3 8 1 5 2 0 0 0
1 7 5 3 9 0 0 0 0
2 6 9 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row1
Number: 2 has occured: 0 times in row1
Number: 3 has occured: 1 times in row1
Number: 4 has occured: 0 times in row1
Number: 5 has occured: 1 times in row1
Number: 6 has occured: 0 times in row1
Number: 7 has occured: 1 times in row1
Number: 8 has occured: 0 times in row1
Number: 9 has occured: 1 times in row1
Number: 1 has occured: 0 times in column 4
Number: 2 has occured: 0 times in column 4
Number: 3 has occured: 0 times in column 4
Number: 4 has occured: 0 times in column 4
Number: 5 has occured: 1 times in column 4
Number: 6 has occured: 0 times in column 4
Number: 7 has occured: 0 times in column 4
Number: 8 has occured: 0 times in column 4
Number: 9 has occured: 1 times in column 4
Selecting grid (3x3) 2 from : 20
Total numbers processed so far: 15 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 5
The current coordinate(3x3): (1,2)
Following number chosen: 7
being stored at coordinate(9x9): (1,5)
currently processing this from 3 x 3:(1,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5)
FILLING BOARD

4 3 8 1 5 2 0 0 0
1 7 5 3 9 7 0 0 0
2 6 9 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row1
Number: 2 has occured: 0 times in row1
Number: 3 has occured: 1 times in row1
Number: 4 has occured: 0 times in row1
Number: 5 has occured: 1 times in row1
Number: 6 has occured: 0 times in row1
Number: 7 has occured: 2 times in row1
Number: 8 has occured: 0 times in row1
Number: 9 has occured: 1 times in row1
Number: 1 has occured: 0 times in column 5
Number: 2 has occured: 1 times in column 5
Number: 3 has occured: 0 times in column 5
Number: 4 has occured: 0 times in column 5
Number: 5 has occured: 0 times in column 5
Number: 6 has occured: 0 times in column 5
Number: 7 has occured: 1 times in column 5
Number: 8 has occured: 0 times in column 5
Number: 9 has occured: 0 times in column 5
Selecting grid (3x3) 2 from : 20
Total numbers processed so far: 16 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 3
The current coordinate(3x3): (2,0)
Following number chosen: 4
being stored at coordinate(9x9): (2,3)
currently processing this from 3 x 3:(2,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3)
FILLING BOARD
4 3 8 1 5 2 0 0 0
1 7 5 3 9 7 0 0 0
2 6 9 4 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row2
Number: 2 has occured: 1 times in row2

Number: 3 has occured: 0 times in row2
Number: 4 has occured: 1 times in row2
Number: 5 has occured: 0 times in row2
Number: 6 has occured: 1 times in row2
Number: 7 has occured: 0 times in row2
Number: 8 has occured: 0 times in row2
Number: 9 has occured: 1 times in row2
Number: 1 has occured: 1 times in column 3
Number: 2 has occured: 0 times in column 3
Number: 3 has occured: 1 times in column 3
Number: 4 has occured: 1 times in column 3
Number: 5 has occured: 0 times in column 3
Number: 6 has occured: 0 times in column 3
Number: 7 has occured: 0 times in column 3
Number: 8 has occured: 0 times in column 3
Number: 9 has occured: 0 times in column 3
Selecting grid (3x3) 2 from : 20
Total numbers processed so far: 17 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 4
The current coordinate(3x3): (2,1)
Following number chosen: 6
being stored at coordinate(9x9): (2,4)
currently processing this from 3 x 3:(2,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4) 7(1,5) 4(2,3) 6(2,4)
FILLING BOARD
4 3 8 1 5 2 0 0 0
1 7 5 3 9 7 0 0 0
2 6 9 4 6 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row2
Number: 2 has occured: 1 times in row2
Number: 3 has occured: 0 times in row2
Number: 4 has occured: 1 times in row2
Number: 5 has occured: 0 times in row2
Number: 6 has occured: 2 times in row2
Number: 7 has occured: 0 times in row2
Number: 8 has occured: 0 times in row2
Number: 9 has occured: 1 times in row2
Number: 1 has occured: 0 times in column 4
Number: 2 has occured: 0 times in column 4
Number: 3 has occured: 0 times in column 4
Number: 4 has occured: 0 times in column 4

Number: 5 has occured: 1 times in column 4
Number: 6 has occured: 1 times in column 4
Number: 7 has occured: 0 times in column 4
Number: 8 has occured: 0 times in column 4
Number: 9 has occured: 1 times in column 4
Selecting grid (3x3) 2 from : 20
Total numbers processed so far: 18 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 5
The current coordinate(3x3): (2,2)
Following number chosen: 8
being stored at coordinate(9x9): (2,5)
currently processing this from 3 x 3:(2,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5)
FILLING BOARD
4 3 8 1 5 2 0 0 0
1 7 5 3 9 7 0 0 0
2 6 9 4 6 8 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row2
Number: 2 has occured: 1 times in row2
Number: 3 has occured: 0 times in row2
Number: 4 has occured: 1 times in row2
Number: 5 has occured: 0 times in row2
Number: 6 has occured: 2 times in row2
Number: 7 has occured: 0 times in row2
Number: 8 has occured: 1 times in row2
Number: 9 has occured: 1 times in row2
Number: 1 has occured: 0 times in column 5
Number: 2 has occured: 1 times in column 5
Number: 3 has occured: 0 times in column 5
Number: 4 has occured: 0 times in column 5
Number: 5 has occured: 0 times in column 5
Number: 6 has occured: 0 times in column 5
Number: 7 has occured: 1 times in column 5
Number: 8 has occured: 1 times in column 5
Number: 9 has occured: 0 times in column 5
****
****
Selecting grid (3x3) 3 from : 20
Total numbers processed so far: 19 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 6

The current coordinate(3x3): (0,0)
Following number chosen: 4
being stored at coordinate(9x9): (0,6)
currently processing this from 3 x 3:(0,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6)
FILLING BOARD
4 3 8 1 5 2 4 0 0
1 7 5 3 9 7 0 0 0
2 6 9 4 6 8 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row0
Number: 2 has occured: 1 times in row0
Number: 3 has occured: 1 times in row0
Number: 4 has occured: 2 times in row0
Number: 5 has occured: 1 times in row0
Number: 6 has occured: 0 times in row0
Number: 7 has occured: 0 times in row0
Number: 8 has occured: 1 times in row0
Number: 9 has occured: 0 times in row0
Number: 1 has occured: 0 times in column 6
Number: 2 has occured: 0 times in column 6
Number: 3 has occured: 0 times in column 6
Number: 4 has occured: 1 times in column 6
Number: 5 has occured: 0 times in column 6
Number: 6 has occured: 0 times in column 6
Number: 7 has occured: 0 times in column 6
Number: 8 has occured: 0 times in column 6
Number: 9 has occured: 0 times in column 6
Selecting grid (3x3) 3 from : 20
Total numbers processed so far: 20 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 7
The current coordinate(3x3): (0,1)
Following number chosen: 3
being stored at coordinate(9x9): (0,7)
currently processing this from 3 x 3:(0,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7)
FILLING BOARD
4 3 8 1 5 2 4 3 0
1 7 5 3 9 7 0 0 0
2 6 9 4 6 8 0 0 0
0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row0
Number: 2 has occured: 1 times in row0
Number: 3 has occured: 2 times in row0
Number: 4 has occured: 2 times in row0
Number: 5 has occured: 1 times in row0
Number: 6 has occured: 0 times in row0
Number: 7 has occured: 0 times in row0
Number: 8 has occured: 1 times in row0
Number: 9 has occured: 0 times in row0
Number: 1 has occured: 0 times in column 7
Number: 2 has occured: 0 times in column 7
Number: 3 has occured: 1 times in column 7
Number: 4 has occured: 0 times in column 7
Number: 5 has occured: 0 times in column 7
Number: 6 has occured: 0 times in column 7
Number: 7 has occured: 0 times in column 7
Number: 8 has occured: 0 times in column 7
Number: 9 has occured: 0 times in column 7
Selecting grid (3x3) 3 from : 20
Total numbers processed so far: 21 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 8
The current coordinate(3x3): (0,2)
Following number chosen: 1
being stored at coordinate(9x9): (0,8)
currently processing this from 3 x 3:(0,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 0 0 0
2 6 9 4 6 8 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 2 times in row0
Number: 2 has occured: 1 times in row0
Number: 3 has occured: 2 times in row0
Number: 4 has occured: 2 times in row0
Number: 5 has occured: 1 times in row0
Number: 6 has occured: 0 times in row0

Number: 7 has occured: 0 times in row0
Number: 8 has occured: 1 times in row0
Number: 9 has occured: 0 times in row0
Number: 1 has occured: 1 times in column 8
Number: 2 has occured: 0 times in column 8
Number: 3 has occured: 0 times in column 8
Number: 4 has occured: 0 times in column 8
Number: 5 has occured: 0 times in column 8
Number: 6 has occured: 0 times in column 8
Number: 7 has occured: 0 times in column 8
Number: 8 has occured: 0 times in column 8
Number: 9 has occured: 0 times in column 8
Selecting grid (3x3) 3 from : 20
Total numbers processed so far: 22 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 6
The current coordinate(3x3): (1,0)
Following number chosen: 2
being stored at coordinate(9x9): (1,6)
currently processing this from 3 x 3:(1,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 0 0
2 6 9 4 6 8 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row1
Number: 2 has occured: 1 times in row1
Number: 3 has occured: 1 times in row1
Number: 4 has occured: 0 times in row1
Number: 5 has occured: 1 times in row1
Number: 6 has occured: 0 times in row1
Number: 7 has occured: 2 times in row1
Number: 8 has occured: 0 times in row1
Number: 9 has occured: 1 times in row1
Number: 1 has occured: 0 times in column 6
Number: 2 has occured: 1 times in column 6
Number: 3 has occured: 0 times in column 6
Number: 4 has occured: 1 times in column 6
Number: 5 has occured: 0 times in column 6
Number: 6 has occured: 0 times in column 6
Number: 7 has occured: 0 times in column 6
Number: 8 has occured: 0 times in column 6

Number: 9 has occured: 0 times in column 6
Selecting grid (3x3) 3 from : 20
Total numbers processed so far: 23 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 7
The current coordinate(3x3): (1,1)
Following number chosen: 5
being stored at coordinate(9x9): (1,7)
currently processing this from 3 x 3:(1,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 0
2 6 9 4 6 8 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row1
Number: 2 has occured: 1 times in row1
Number: 3 has occured: 1 times in row1
Number: 4 has occured: 0 times in row1
Number: 5 has occured: 2 times in row1
Number: 6 has occured: 0 times in row1
Number: 7 has occured: 2 times in row1
Number: 8 has occured: 0 times in row1
Number: 9 has occured: 1 times in row1
Number: 1 has occured: 0 times in column 7
Number: 2 has occured: 0 times in column 7
Number: 3 has occured: 1 times in column 7
Number: 4 has occured: 0 times in column 7
Number: 5 has occured: 1 times in column 7
Number: 6 has occured: 0 times in column 7
Number: 7 has occured: 0 times in column 7
Number: 8 has occured: 0 times in column 7
Number: 9 has occured: 0 times in column 7
Selecting grid (3x3) 3 from : 20
Total numbers processed so far: 24 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 8
The current coordinate(3x3): (1,2)
Following number chosen: 6
being stored at coordinate(9x9): (1,8)
currently processing this from 3 x 3:(1,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8)

FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row1
Number: 2 has occured: 1 times in row1
Number: 3 has occured: 1 times in row1
Number: 4 has occured: 0 times in row1
Number: 5 has occured: 2 times in row1
Number: 6 has occured: 1 times in row1
Number: 7 has occured: 2 times in row1
Number: 8 has occured: 0 times in row1
Number: 9 has occured: 1 times in row1
Number: 1 has occured: 1 times in column 8
Number: 2 has occured: 0 times in column 8
Number: 3 has occured: 0 times in column 8
Number: 4 has occured: 0 times in column 8
Number: 5 has occured: 0 times in column 8
Number: 6 has occured: 1 times in column 8
Number: 7 has occured: 0 times in column 8
Number: 8 has occured: 0 times in column 8
Number: 9 has occured: 0 times in column 8
Selecting grid (3x3) 3 from : 20
Total numbers processed so far: 25 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 6
The current coordinate(3x3): (2,0)
Following number chosen: 8
being stored at coordinate(9x9): (2,6)
currently processing this from 3 x 3:(2,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row2

Number: 2 has occured: 1 times in row2
Number: 3 has occured: 0 times in row2
Number: 4 has occured: 1 times in row2
Number: 5 has occured: 0 times in row2
Number: 6 has occured: 2 times in row2
Number: 7 has occured: 0 times in row2
Number: 8 has occured: 2 times in row2
Number: 9 has occured: 1 times in row2
Number: 1 has occured: 0 times in column 6
Number: 2 has occured: 1 times in column 6
Number: 3 has occured: 0 times in column 6
Number: 4 has occured: 1 times in column 6
Number: 5 has occured: 0 times in column 6
Number: 6 has occured: 0 times in column 6
Number: 7 has occured: 0 times in column 6
Number: 8 has occured: 1 times in column 6
Number: 9 has occured: 0 times in column 6
Selecting grid (3x3) 3 from : 20
Total numbers processed so far: 26 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 7
The current coordinate(3x3): (2,1)
Following number chosen: 7
being stored at coordinate(9x9): (2,7)
currently processing this from 3 x 3:(2,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row2
Number: 2 has occured: 1 times in row2
Number: 3 has occured: 0 times in row2
Number: 4 has occured: 1 times in row2
Number: 5 has occured: 0 times in row2
Number: 6 has occured: 2 times in row2
Number: 7 has occured: 1 times in row2
Number: 8 has occured: 2 times in row2
Number: 9 has occured: 1 times in row2
Number: 1 has occured: 0 times in column 7
Number: 2 has occured: 0 times in column 7
Number: 3 has occured: 1 times in column 7

Number: 4 has occured: 0 times in column 7
Number: 5 has occured: 1 times in column 7
Number: 6 has occured: 0 times in column 7
Number: 7 has occured: 1 times in column 7
Number: 8 has occured: 0 times in column 7
Number: 9 has occured: 0 times in column 7
Selecting grid (3x3) 3 from : 20
Total numbers processed so far: 27 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 8
The current coordinate(3x3): (2,2)
Following number chosen: 9
being stored at coordinate(9x9): (2,8)
currently processing this from 3 x 3:(2,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row2
Number: 2 has occured: 1 times in row2
Number: 3 has occured: 0 times in row2
Number: 4 has occured: 1 times in row2
Number: 5 has occured: 0 times in row2
Number: 6 has occured: 2 times in row2
Number: 7 has occured: 1 times in row2
Number: 8 has occured: 2 times in row2
Number: 9 has occured: 2 times in row2
Number: 1 has occured: 1 times in column 8
Number: 2 has occured: 0 times in column 8
Number: 3 has occured: 0 times in column 8
Number: 4 has occured: 0 times in column 8
Number: 5 has occured: 0 times in column 8
Number: 6 has occured: 1 times in column 8
Number: 7 has occured: 0 times in column 8
Number: 8 has occured: 0 times in column 8
Number: 9 has occured: 1 times in column 8
****
****
Selecting grid (3x3) 4 from : 20
Total numbers processed so far: 28 out of 81
Current offset in 9x9 grid: 0

Starting in this col in 9 x 9: 0
The current coordinate(3x3): (0,0)
Following number chosen: 8
being stored at coordinate(9x9): (3,0)
currently processing this from 3 x 3:(0,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row3
Number: 2 has occured: 0 times in row3
Number: 3 has occured: 0 times in row3
Number: 4 has occured: 0 times in row3
Number: 5 has occured: 0 times in row3
Number: 6 has occured: 0 times in row3
Number: 7 has occured: 0 times in row3
Number: 8 has occured: 1 times in row3
Number: 9 has occured: 0 times in row3
Number: 1 has occured: 1 times in column 0
Number: 2 has occured: 1 times in column 0
Number: 3 has occured: 0 times in column 0
Number: 4 has occured: 1 times in column 0
Number: 5 has occured: 0 times in column 0
Number: 6 has occured: 0 times in column 0
Number: 7 has occured: 0 times in column 0
Number: 8 has occured: 1 times in column 0
Number: 9 has occured: 0 times in column 0
Selecting grid (3x3) 4 from : 20
Total numbers processed so far: 29 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 1
The current coordinate(3x3): (0,1)
Following number chosen: 4
being stored at coordinate(9x9): (3,1)
currently processing this from 3 x 3:(0,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6

2 6 9 4 6 8 8 7 9
8 4 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row3
Number: 2 has occured: 0 times in row3
Number: 3 has occured: 0 times in row3
Number: 4 has occured: 1 times in row3
Number: 5 has occured: 0 times in row3
Number: 6 has occured: 0 times in row3
Number: 7 has occured: 0 times in row3
Number: 8 has occured: 1 times in row3
Number: 9 has occured: 0 times in row3
Number: 1 has occured: 0 times in column 1
Number: 2 has occured: 0 times in column 1
Number: 3 has occured: 1 times in column 1
Number: 4 has occured: 1 times in column 1
Number: 5 has occured: 0 times in column 1
Number: 6 has occured: 1 times in column 1
Number: 7 has occured: 1 times in column 1
Number: 8 has occured: 0 times in column 1
Number: 9 has occured: 0 times in column 1
Selecting grid (3x3) 4 from : 20
Total numbers processed so far: 30 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 2
The current coordinate(3x3): (0,2)
Following number chosen: 2
being stored at coordinate(9x9): (3,2)
currently processing this from 3 x 3:(0,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row3
Number: 2 has occured: 1 times in row3
Number: 3 has occured: 0 times in row3

Number: 4 has occured: 1 times in row3
Number: 5 has occured: 0 times in row3
Number: 6 has occured: 0 times in row3
Number: 7 has occured: 0 times in row3
Number: 8 has occured: 1 times in row3
Number: 9 has occured: 0 times in row3
Number: 1 has occured: 0 times in column 2
Number: 2 has occured: 1 times in column 2
Number: 3 has occured: 0 times in column 2
Number: 4 has occured: 0 times in column 2
Number: 5 has occured: 1 times in column 2
Number: 6 has occured: 0 times in column 2
Number: 7 has occured: 0 times in column 2
Number: 8 has occured: 1 times in column 2
Number: 9 has occured: 1 times in column 2
Selecting grid (3x3) 4 from : 20
Total numbers processed so far: 31 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 0
The current coordinate(3x3): (1,0)
Following number chosen: 3
being stored at coordinate(9x9): (4,0)
currently processing this from 3 x 3:(1,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 0 0 0 0 0 0
3 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row4
Number: 2 has occured: 0 times in row4
Number: 3 has occured: 1 times in row4
Number: 4 has occured: 0 times in row4
Number: 5 has occured: 0 times in row4
Number: 6 has occured: 0 times in row4
Number: 7 has occured: 0 times in row4
Number: 8 has occured: 0 times in row4
Number: 9 has occured: 0 times in row4
Number: 1 has occured: 1 times in column 0
Number: 2 has occured: 1 times in column 0
Number: 3 has occured: 1 times in column 0
Number: 4 has occured: 1 times in column 0

Number: 5 has occured: 0 times in column 0
Number: 6 has occured: 0 times in column 0
Number: 7 has occured: 0 times in column 0
Number: 8 has occured: 1 times in column 0
Number: 9 has occured: 0 times in column 0
Selecting grid (3x3) 4 from : 20
Total numbers processed so far: 32 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 1
The current coordinate(3x3): (1,1)
Following number chosen: 9
being stored at coordinate(9x9): (4,1)
currently processing this from 3 x 3:(1,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 0 0 0 0 0 0
3 9 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row4
Number: 2 has occured: 0 times in row4
Number: 3 has occured: 1 times in row4
Number: 4 has occured: 0 times in row4
Number: 5 has occured: 0 times in row4
Number: 6 has occured: 0 times in row4
Number: 7 has occured: 0 times in row4
Number: 8 has occured: 0 times in row4
Number: 9 has occured: 1 times in row4
Number: 1 has occured: 0 times in column 1
Number: 2 has occured: 0 times in column 1
Number: 3 has occured: 1 times in column 1
Number: 4 has occured: 1 times in column 1
Number: 5 has occured: 0 times in column 1
Number: 6 has occured: 1 times in column 1
Number: 7 has occured: 1 times in column 1
Number: 8 has occured: 0 times in column 1
Number: 9 has occured: 1 times in column 1
Selecting grid (3x3) 4 from : 20
Total numbers processed so far: 33 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 2
The current coordinate(3x3): (1,2)

Following number chosen: 7
being stored at coordinate(9x9): (4,2)
currently processing this from 3 x 3:(1,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 0 0 0 0 0 0
3 9 7 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row4
Number: 2 has occured: 0 times in row4
Number: 3 has occured: 1 times in row4
Number: 4 has occured: 0 times in row4
Number: 5 has occured: 0 times in row4
Number: 6 has occured: 0 times in row4
Number: 7 has occured: 1 times in row4
Number: 8 has occured: 0 times in row4
Number: 9 has occured: 1 times in row4
Number: 1 has occured: 0 times in column 2
Number: 2 has occured: 1 times in column 2
Number: 3 has occured: 0 times in column 2
Number: 4 has occured: 0 times in column 2
Number: 5 has occured: 1 times in column 2
Number: 6 has occured: 0 times in column 2
Number: 7 has occured: 1 times in column 2
Number: 8 has occured: 1 times in column 2
Number: 9 has occured: 1 times in column 2
Selecting grid (3x3) 4 from : 20
Total numbers processed so far: 34 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 0
The current coordinate(3x3): (2,0)
Following number chosen: 1
being stored at coordinate(9x9): (5,0)
currently processing this from 3 x 3:(2,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9

8 4 2 0 0 0 0 0 0
3 9 7 0 0 0 0 0 0
1 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row5
Number: 2 has occured: 0 times in row5
Number: 3 has occured: 0 times in row5
Number: 4 has occured: 0 times in row5
Number: 5 has occured: 0 times in row5
Number: 6 has occured: 0 times in row5
Number: 7 has occured: 0 times in row5
Number: 8 has occured: 0 times in row5
Number: 9 has occured: 0 times in row5
Number: 1 has occured: 2 times in column 0
Number: 2 has occured: 1 times in column 0
Number: 3 has occured: 1 times in column 0
Number: 4 has occured: 1 times in column 0
Number: 5 has occured: 0 times in column 0
Number: 6 has occured: 0 times in column 0
Number: 7 has occured: 0 times in column 0
Number: 8 has occured: 1 times in column 0
Number: 9 has occured: 0 times in column 0
Selecting grid (3x3) 4 from : 20
Total numbers processed so far: 35 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 1
The current coordinate(3x3): (2,1)
Following number chosen: 5
being stored at coordinate(9x9): (5,1)
currently processing this from 3 x 3:(2,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 0 0 0 0 0 0
3 9 7 0 0 0 0 0 0
1 5 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row5
Number: 2 has occured: 0 times in row5
Number: 3 has occured: 0 times in row5
Number: 4 has occured: 0 times in row5

Number: 5 has occured: 1 times in row5
Number: 6 has occured: 0 times in row5
Number: 7 has occured: 0 times in row5
Number: 8 has occured: 0 times in row5
Number: 9 has occured: 0 times in row5
Number: 1 has occured: 0 times in column 1
Number: 2 has occured: 0 times in column 1
Number: 3 has occured: 1 times in column 1
Number: 4 has occured: 1 times in column 1
Number: 5 has occured: 1 times in column 1
Number: 6 has occured: 1 times in column 1
Number: 7 has occured: 1 times in column 1
Number: 8 has occured: 0 times in column 1
Number: 9 has occured: 1 times in column 1
Selecting grid (3x3) 4 from : 20
Total numbers processed so far: 36 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 2
The current coordinate(3x3): (2,2)
Following number chosen: 6
being stored at coordinate(9x9): (5,2)
currently processing this from 3 x 3:(2,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4) 7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0) 4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 0 0 0 0 0 0
3 9 7 0 0 0 0 0 0
1 5 6 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row5
Number: 2 has occured: 0 times in row5
Number: 3 has occured: 0 times in row5
Number: 4 has occured: 0 times in row5
Number: 5 has occured: 1 times in row5
Number: 6 has occured: 1 times in row5
Number: 7 has occured: 0 times in row5
Number: 8 has occured: 0 times in row5
Number: 9 has occured: 0 times in row5
Number: 1 has occured: 0 times in column 2
Number: 2 has occured: 1 times in column 2
Number: 3 has occured: 0 times in column 2
Number: 4 has occured: 0 times in column 2
Number: 5 has occured: 1 times in column 2

Number: 6 has occured: 1 times in column 2
Number: 7 has occured: 1 times in column 2
Number: 8 has occured: 1 times in column 2
Number: 9 has occured: 1 times in column 2
****
****
Selecting grid (3x3) 5 from : 20
Total numbers processed so far: 37 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 3
The current coordinate(3x3): (0,0)
Following number chosen: 1
being stored at coordinate(9x9): (3,3)
currently processing this from 3 x 3:(0,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4) 7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0) 4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 0 0 0 0 0
3 9 7 0 0 0 0 0 0
1 5 6 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row3
Number: 2 has occured: 1 times in row3
Number: 3 has occured: 0 times in row3
Number: 4 has occured: 1 times in row3
Number: 5 has occured: 0 times in row3
Number: 6 has occured: 0 times in row3
Number: 7 has occured: 0 times in row3
Number: 8 has occured: 1 times in row3
Number: 9 has occured: 0 times in row3
Number: 1 has occured: 2 times in column 3
Number: 2 has occured: 0 times in column 3
Number: 3 has occured: 1 times in column 3
Number: 4 has occured: 1 times in column 3
Number: 5 has occured: 0 times in column 3
Number: 6 has occured: 0 times in column 3
Number: 7 has occured: 0 times in column 3
Number: 8 has occured: 0 times in column 3
Number: 9 has occured: 0 times in column 3
Selecting grid (3x3) 5 from : 20
Total numbers processed so far: 38 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 4

The current coordinate(3x3): (0,1)
Following number chosen: 6
being stored at coordinate(9x9): (3,4)
currently processing this from 3 x 3:(0,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 0 0 0 0
3 9 7 0 0 0 0 0 0
1 5 6 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row3
Number: 2 has occured: 1 times in row3
Number: 3 has occured: 0 times in row3
Number: 4 has occured: 1 times in row3
Number: 5 has occured: 0 times in row3
Number: 6 has occured: 1 times in row3
Number: 7 has occured: 0 times in row3
Number: 8 has occured: 1 times in row3
Number: 9 has occured: 0 times in row3
Number: 1 has occured: 0 times in column 4
Number: 2 has occured: 0 times in column 4
Number: 3 has occured: 0 times in column 4
Number: 4 has occured: 0 times in column 4
Number: 5 has occured: 1 times in column 4
Number: 6 has occured: 2 times in column 4
Number: 7 has occured: 0 times in column 4
Number: 8 has occured: 0 times in column 4
Number: 9 has occured: 1 times in column 4
Selecting grid (3x3) 5 from : 20
Total numbers processed so far: 39 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 5
The current coordinate(3x3): (0,2)
Following number chosen: 4
being stored at coordinate(9x9): (3,5)
currently processing this from 3 x 3:(0,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6

2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 0 0 0
3 9 7 0 0 0 0 0 0
1 5 6 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row3
Number: 2 has occured: 1 times in row3
Number: 3 has occured: 0 times in row3
Number: 4 has occured: 2 times in row3
Number: 5 has occured: 0 times in row3
Number: 6 has occured: 1 times in row3
Number: 7 has occured: 0 times in row3
Number: 8 has occured: 1 times in row3
Number: 9 has occured: 0 times in row3
Number: 1 has occured: 0 times in column 5
Number: 2 has occured: 1 times in column 5
Number: 3 has occured: 0 times in column 5
Number: 4 has occured: 1 times in column 5
Number: 5 has occured: 0 times in column 5
Number: 6 has occured: 0 times in column 5
Number: 7 has occured: 1 times in column 5
Number: 8 has occured: 1 times in column 5
Number: 9 has occured: 0 times in column 5
Selecting grid (3x3) 5 from : 20
Total numbers processed so far: 40 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 3
The current coordinate(3x3): (1,0)
Following number chosen: 7
being stored at coordinate(9x9): (4,3)
currently processing this from 3 x 3:(1,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 0 0 0
3 9 7 7 0 0 0 0 0
1 5 6 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row4
Number: 2 has occured: 0 times in row4
Number: 3 has occured: 1 times in row4

Number: 4 has occured: 0 times in row4
Number: 5 has occured: 0 times in row4
Number: 6 has occured: 0 times in row4
Number: 7 has occured: 2 times in row4
Number: 8 has occured: 0 times in row4
Number: 9 has occured: 1 times in row4
Number: 1 has occured: 2 times in column 3
Number: 2 has occured: 0 times in column 3
Number: 3 has occured: 1 times in column 3
Number: 4 has occured: 1 times in column 3
Number: 5 has occured: 0 times in column 3
Number: 6 has occured: 0 times in column 3
Number: 7 has occured: 1 times in column 3
Number: 8 has occured: 0 times in column 3
Number: 9 has occured: 0 times in column 3
Selecting grid (3x3) 5 from : 20
Total numbers processed so far: 41 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 4
The current coordinate(3x3): (1,1)
Following number chosen: 8
being stored at coordinate(9x9): (4,4)
currently processing this from 3 x 3:(1,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 0 0 0
3 9 7 7 8 0 0 0 0
1 5 6 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row4
Number: 2 has occured: 0 times in row4
Number: 3 has occured: 1 times in row4
Number: 4 has occured: 0 times in row4
Number: 5 has occured: 0 times in row4
Number: 6 has occured: 0 times in row4
Number: 7 has occured: 2 times in row4
Number: 8 has occured: 1 times in row4
Number: 9 has occured: 1 times in row4
Number: 1 has occured: 0 times in column 4
Number: 2 has occured: 0 times in column 4
Number: 3 has occured: 0 times in column 4
Number: 4 has occured: 0 times in column 4

Number: 5 has occured: 1 times in column 4
Number: 6 has occured: 2 times in column 4
Number: 7 has occured: 0 times in column 4
Number: 8 has occured: 1 times in column 4
Number: 9 has occured: 1 times in column 4
Selecting grid (3x3) 5 from : 20
Total numbers processed so far: 42 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 5
The current coordinate(3x3): (1,2)
Following number chosen: 2
being stored at coordinate(9x9): (4,5)
currently processing this from 3 x 3:(1,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 0 0 0
3 9 7 7 8 2 0 0 0
1 5 6 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row4
Number: 2 has occured: 1 times in row4
Number: 3 has occured: 1 times in row4
Number: 4 has occured: 0 times in row4
Number: 5 has occured: 0 times in row4
Number: 6 has occured: 0 times in row4
Number: 7 has occured: 2 times in row4
Number: 8 has occured: 1 times in row4
Number: 9 has occured: 1 times in row4
Number: 1 has occured: 0 times in column 5
Number: 2 has occured: 2 times in column 5
Number: 3 has occured: 0 times in column 5
Number: 4 has occured: 1 times in column 5
Number: 5 has occured: 0 times in column 5
Number: 6 has occured: 0 times in column 5
Number: 7 has occured: 1 times in column 5
Number: 8 has occured: 1 times in column 5
Number: 9 has occured: 0 times in column 5
Selecting grid (3x3) 5 from : 20
Total numbers processed so far: 43 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 3
The current coordinate(3x3): (2,0)

Following number chosen: 5
being stored at coordinate(9x9): (5,3)
currently processing this from 3 x 3:(2,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4) 7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0) 4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5) 5(5,3)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 0 0 0
3 9 7 7 8 2 0 0 0
1 5 6 5 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row5
Number: 2 has occured: 0 times in row5
Number: 3 has occured: 0 times in row5
Number: 4 has occured: 0 times in row5
Number: 5 has occured: 2 times in row5
Number: 6 has occured: 1 times in row5
Number: 7 has occured: 0 times in row5
Number: 8 has occured: 0 times in row5
Number: 9 has occured: 0 times in row5
Number: 1 has occured: 2 times in column 3
Number: 2 has occured: 0 times in column 3
Number: 3 has occured: 1 times in column 3
Number: 4 has occured: 1 times in column 3
Number: 5 has occured: 1 times in column 3
Number: 6 has occured: 0 times in column 3
Number: 7 has occured: 1 times in column 3
Number: 8 has occured: 0 times in column 3
Number: 9 has occured: 0 times in column 3
Selecting grid (3x3) 5 from : 20
Total numbers processed so far: 44 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 4
The current coordinate(3x3): (2,1)
Following number chosen: 9
being stored at coordinate(9x9): (5,4)
currently processing this from 3 x 3:(2,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4) 7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0) 4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5) 5(5,3) 9(5,4)
FILLING BOARD
4 3 8 1 5 2 4 3 1

1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 0 0 0
3 9 7 7 8 2 0 0 0
1 5 6 5 9 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row5
Number: 2 has occured: 0 times in row5
Number: 3 has occured: 0 times in row5
Number: 4 has occured: 0 times in row5
Number: 5 has occured: 2 times in row5
Number: 6 has occured: 1 times in row5
Number: 7 has occured: 0 times in row5
Number: 8 has occured: 0 times in row5
Number: 9 has occured: 1 times in row5
Number: 1 has occured: 0 times in column 4
Number: 2 has occured: 0 times in column 4
Number: 3 has occured: 0 times in column 4
Number: 4 has occured: 0 times in column 4
Number: 5 has occured: 1 times in column 4
Number: 6 has occured: 2 times in column 4
Number: 7 has occured: 0 times in column 4
Number: 8 has occured: 1 times in column 4
Number: 9 has occured: 2 times in column 4
Selecting grid (3x3) 5 from : 20
Total numbers processed so far: 45 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 5
The current coordinate(3x3): (2,2)
Following number chosen: 3
being stored at coordinate(9x9): (5,5)
currently processing this from 3 x 3:(2,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 0 0 0
3 9 7 7 8 2 0 0 0
1 5 6 5 9 3 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row5

Number: 2 has occured: 0 times in row5
Number: 3 has occured: 1 times in row5
Number: 4 has occured: 0 times in row5
Number: 5 has occured: 2 times in row5
Number: 6 has occured: 1 times in row5
Number: 7 has occured: 0 times in row5
Number: 8 has occured: 0 times in row5
Number: 9 has occured: 1 times in row5
Number: 1 has occured: 0 times in column 5
Number: 2 has occured: 2 times in column 5
Number: 3 has occured: 1 times in column 5
Number: 4 has occured: 1 times in column 5
Number: 5 has occured: 0 times in column 5
Number: 6 has occured: 0 times in column 5
Number: 7 has occured: 1 times in column 5
Number: 8 has occured: 1 times in column 5
Number: 9 has occured: 0 times in column 5
****
****
Selecting grid (3x3) 6 from : 20
Total numbers processed so far: 46 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 6
The current coordinate(3x3): (0,0)
Following number chosen: 4
being stored at coordinate(9x9): (3,6)
currently processing this from 3 x 3:(0,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4) 7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0) 4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5) 5(5,3) 9(5,4) 3(5,5) 4(3,6)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 0 0
3 9 7 7 8 2 0 0 0
1 5 6 5 9 3 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row3
Number: 2 has occured: 1 times in row3
Number: 3 has occured: 0 times in row3
Number: 4 has occured: 3 times in row3
Number: 5 has occured: 0 times in row3
Number: 6 has occured: 1 times in row3
Number: 7 has occured: 0 times in row3
Number: 8 has occured: 1 times in row3

Number: 9 has occured: 0 times in row3
Number: 1 has occured: 0 times in column 6
Number: 2 has occured: 1 times in column 6
Number: 3 has occured: 0 times in column 6
Number: 4 has occured: 2 times in column 6
Number: 5 has occured: 0 times in column 6
Number: 6 has occured: 0 times in column 6
Number: 7 has occured: 0 times in column 6
Number: 8 has occured: 1 times in column 6
Number: 9 has occured: 0 times in column 6
Selecting grid (3x3) 6 from : 20
Total numbers processed so far: 47 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 7
The current coordinate(3x3): (0,1)
Following number chosen: 8
being stored at coordinate(9x9): (3,7)
currently processing this from 3 x 3:(0,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4) 7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0) 4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5) 5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 0
3 9 7 7 8 2 0 0 0
1 5 6 5 9 3 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row3
Number: 2 has occured: 1 times in row3
Number: 3 has occured: 0 times in row3
Number: 4 has occured: 3 times in row3
Number: 5 has occured: 0 times in row3
Number: 6 has occured: 1 times in row3
Number: 7 has occured: 0 times in row3
Number: 8 has occured: 2 times in row3
Number: 9 has occured: 0 times in row3
Number: 1 has occured: 0 times in column 7
Number: 2 has occured: 0 times in column 7
Number: 3 has occured: 1 times in column 7
Number: 4 has occured: 0 times in column 7
Number: 5 has occured: 1 times in column 7
Number: 6 has occured: 0 times in column 7
Number: 7 has occured: 1 times in column 7
Number: 8 has occured: 1 times in column 7

Number: 9 has occured: 0 times in column 7
Selecting grid (3x3) 6 from : 20
Total numbers processed so far: 48 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 8
The current coordinate(3x3): (0,2)
Following number chosen: 5
being stored at coordinate(9x9): (3,8)
currently processing this from 3 x 3:(0,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4) 7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0) 4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5) 5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 0 0 0
1 5 6 5 9 3 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row3
Number: 2 has occured: 1 times in row3
Number: 3 has occured: 0 times in row3
Number: 4 has occured: 3 times in row3
Number: 5 has occured: 1 times in row3
Number: 6 has occured: 1 times in row3
Number: 7 has occured: 0 times in row3
Number: 8 has occured: 2 times in row3
Number: 9 has occured: 0 times in row3
Number: 1 has occured: 1 times in column 8
Number: 2 has occured: 0 times in column 8
Number: 3 has occured: 0 times in column 8
Number: 4 has occured: 0 times in column 8
Number: 5 has occured: 1 times in column 8
Number: 6 has occured: 1 times in column 8
Number: 7 has occured: 0 times in column 8
Number: 8 has occured: 0 times in column 8
Number: 9 has occured: 1 times in column 8
Selecting grid (3x3) 6 from : 20
Total numbers processed so far: 49 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 6
The current coordinate(3x3): (1,0)
Following number chosen: 2
being stored at coordinate(9x9): (4,6)
currently processing this from 3 x 3:(1,0)

4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 0 0
1 5 6 5 9 3 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row4
Number: 2 has occured: 2 times in row4
Number: 3 has occured: 1 times in row4
Number: 4 has occured: 0 times in row4
Number: 5 has occured: 0 times in row4
Number: 6 has occured: 0 times in row4
Number: 7 has occured: 2 times in row4
Number: 8 has occured: 1 times in row4
Number: 9 has occured: 1 times in row4
Number: 1 has occured: 0 times in column 6
Number: 2 has occured: 2 times in column 6
Number: 3 has occured: 0 times in column 6
Number: 4 has occured: 2 times in column 6
Number: 5 has occured: 0 times in column 6
Number: 6 has occured: 0 times in column 6
Number: 7 has occured: 0 times in column 6
Number: 8 has occured: 1 times in column 6
Number: 9 has occured: 0 times in column 6
Selecting grid (3x3) 6 from : 20
Total numbers processed so far: 50 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 7
The current coordinate(3x3): (1,1)
Following number chosen: 3
being stored at coordinate(9x9): (4,7)
currently processing this from 3 x 3:(1,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5

3 9 7 7 8 2 2 3 0
1 5 6 5 9 3 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row4
Number: 2 has occured: 2 times in row4
Number: 3 has occured: 2 times in row4
Number: 4 has occured: 0 times in row4
Number: 5 has occured: 0 times in row4
Number: 6 has occured: 0 times in row4
Number: 7 has occured: 2 times in row4
Number: 8 has occured: 1 times in row4
Number: 9 has occured: 1 times in row4
Number: 1 has occured: 0 times in column 7
Number: 2 has occured: 0 times in column 7
Number: 3 has occured: 2 times in column 7
Number: 4 has occured: 0 times in column 7
Number: 5 has occured: 1 times in column 7
Number: 6 has occured: 0 times in column 7
Number: 7 has occured: 1 times in column 7
Number: 8 has occured: 1 times in column 7
Number: 9 has occured: 0 times in column 7
Selecting grid (3x3) 6 from : 20
Total numbers processed so far: 51 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 8
The current coordinate(3x3): (1,2)
Following number chosen: 6
being stored at coordinate(9x9): (4,8)
currently processing this from 3 x 3:(1,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row4
Number: 2 has occured: 2 times in row4
Number: 3 has occured: 2 times in row4
Number: 4 has occured: 0 times in row4

Number: 5 has occured: 0 times in row4
Number: 6 has occured: 1 times in row4
Number: 7 has occured: 2 times in row4
Number: 8 has occured: 1 times in row4
Number: 9 has occured: 1 times in row4
Number: 1 has occured: 1 times in column 8
Number: 2 has occured: 0 times in column 8
Number: 3 has occured: 0 times in column 8
Number: 4 has occured: 0 times in column 8
Number: 5 has occured: 1 times in column 8
Number: 6 has occured: 2 times in column 8
Number: 7 has occured: 0 times in column 8
Number: 8 has occured: 0 times in column 8
Number: 9 has occured: 1 times in column 8
Selecting grid (3x3) 6 from : 20
Total numbers processed so far: 52 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 6
The current coordinate(3x3): (2,0)
Following number chosen: 9
being stored at coordinate(9x9): (5,6)
currently processing this from 3 x 3:(2,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4) 7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0) 4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5) 5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row5
Number: 2 has occured: 0 times in row5
Number: 3 has occured: 1 times in row5
Number: 4 has occured: 0 times in row5
Number: 5 has occured: 2 times in row5
Number: 6 has occured: 1 times in row5
Number: 7 has occured: 0 times in row5
Number: 8 has occured: 0 times in row5
Number: 9 has occured: 2 times in row5
Number: 1 has occured: 0 times in column 6
Number: 2 has occured: 2 times in column 6
Number: 3 has occured: 0 times in column 6
Number: 4 has occured: 2 times in column 6

Number: 5 has occured: 0 times in column 6
Number: 6 has occured: 0 times in column 6
Number: 7 has occured: 0 times in column 6
Number: 8 has occured: 1 times in column 6
Number: 9 has occured: 1 times in column 6
Selecting grid (3x3) 6 from : 20
Total numbers processed so far: 53 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 7
The current coordinate(3x3): (2,1)
Following number chosen: 1
being stored at coordinate(9x9): (5,7)
currently processing this from 3 x 3:(2,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 2 times in row5
Number: 2 has occured: 0 times in row5
Number: 3 has occured: 1 times in row5
Number: 4 has occured: 0 times in row5
Number: 5 has occured: 2 times in row5
Number: 6 has occured: 1 times in row5
Number: 7 has occured: 0 times in row5
Number: 8 has occured: 0 times in row5
Number: 9 has occured: 2 times in row5
Number: 1 has occured: 1 times in column 7
Number: 2 has occured: 0 times in column 7
Number: 3 has occured: 2 times in column 7
Number: 4 has occured: 0 times in column 7
Number: 5 has occured: 1 times in column 7
Number: 6 has occured: 0 times in column 7
Number: 7 has occured: 1 times in column 7
Number: 8 has occured: 1 times in column 7
Number: 9 has occured: 0 times in column 7
Selecting grid (3x3) 6 from : 20
Total numbers processed so far: 54 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 8

The current coordinate(3x3): (2,2)
Following number chosen: 7
being stored at coordinate(9x9): (5,8)
currently processing this from 3 x 3:(2,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 2 times in row5
Number: 2 has occured: 0 times in row5
Number: 3 has occured: 1 times in row5
Number: 4 has occured: 0 times in row5
Number: 5 has occured: 2 times in row5
Number: 6 has occured: 1 times in row5
Number: 7 has occured: 1 times in row5
Number: 8 has occured: 0 times in row5
Number: 9 has occured: 2 times in row5
Number: 1 has occured: 1 times in column 8
Number: 2 has occured: 0 times in column 8
Number: 3 has occured: 0 times in column 8
Number: 4 has occured: 0 times in column 8
Number: 5 has occured: 1 times in column 8
Number: 6 has occured: 2 times in column 8
Number: 7 has occured: 1 times in column 8
Number: 8 has occured: 0 times in column 8
Number: 9 has occured: 1 times in column 8
****
****
Selecting grid (3x3) 7 from : 20
Total numbers processed so far: 55 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 0
The current coordinate(3x3): (0,0)
Following number chosen: 1
being stored at coordinate(9x9): (6,0)
currently processing this from 3 x 3:(0,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)

4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row6
Number: 2 has occured: 0 times in row6
Number: 3 has occured: 0 times in row6
Number: 4 has occured: 0 times in row6
Number: 5 has occured: 0 times in row6
Number: 6 has occured: 0 times in row6
Number: 7 has occured: 0 times in row6
Number: 8 has occured: 0 times in row6
Number: 9 has occured: 0 times in row6
Number: 1 has occured: 3 times in column 0
Number: 2 has occured: 1 times in column 0
Number: 3 has occured: 1 times in column 0
Number: 4 has occured: 1 times in column 0
Number: 5 has occured: 0 times in column 0
Number: 6 has occured: 0 times in column 0
Number: 7 has occured: 0 times in column 0
Number: 8 has occured: 1 times in column 0
Number: 9 has occured: 0 times in column 0
Selecting grid (3x3) 7 from : 20
Total numbers processed so far: 56 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 1
The current coordinate(3x3): (0,1)
Following number chosen: 7
being stored at coordinate(9x9): (6,1)
currently processing this from 3 x 3:(0,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7

1 7 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row6
Number: 2 has occured: 0 times in row6
Number: 3 has occured: 0 times in row6
Number: 4 has occured: 0 times in row6
Number: 5 has occured: 0 times in row6
Number: 6 has occured: 0 times in row6
Number: 7 has occured: 1 times in row6
Number: 8 has occured: 0 times in row6
Number: 9 has occured: 0 times in row6
Number: 1 has occured: 0 times in column 1
Number: 2 has occured: 0 times in column 1
Number: 3 has occured: 1 times in column 1
Number: 4 has occured: 1 times in column 1
Number: 5 has occured: 1 times in column 1
Number: 6 has occured: 1 times in column 1
Number: 7 has occured: 2 times in column 1
Number: 8 has occured: 0 times in column 1
Number: 9 has occured: 1 times in column 1
Selecting grid (3x3) 7 from : 20
Total numbers processed so far: 57 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 2
The current coordinate(3x3): (0,2)
Following number chosen: 8
being stored at coordinate(9x9): (6,2)
currently processing this from 3 x 3:(0,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4) 7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0) 4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5) 5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1) 8(6,2)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 1 times in row6
Number: 2 has occured: 0 times in row6
Number: 3 has occured: 0 times in row6
Number: 4 has occured: 0 times in row6
Number: 5 has occured: 0 times in row6

Number: 6 has occured: 0 times in row6
Number: 7 has occured: 1 times in row6
Number: 8 has occured: 1 times in row6
Number: 9 has occured: 0 times in row6
Number: 1 has occured: 0 times in column 2
Number: 2 has occured: 1 times in column 2
Number: 3 has occured: 0 times in column 2
Number: 4 has occured: 0 times in column 2
Number: 5 has occured: 1 times in column 2
Number: 6 has occured: 1 times in column 2
Number: 7 has occured: 1 times in column 2
Number: 8 has occured: 2 times in column 2
Number: 9 has occured: 1 times in column 2
Selecting grid (3x3) 7 from : 20
Total numbers processed so far: 58 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 0
The current coordinate(3x3): (1,0)
Following number chosen: 4
being stored at coordinate(9x9): (7,0)
currently processing this from 3 x 3:(1,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4) 7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0) 4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5) 5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1) 8(6,2) 4(7,0)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 0 0 0 0 0 0
4 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row7
Number: 2 has occured: 0 times in row7
Number: 3 has occured: 0 times in row7
Number: 4 has occured: 1 times in row7
Number: 5 has occured: 0 times in row7
Number: 6 has occured: 0 times in row7
Number: 7 has occured: 0 times in row7
Number: 8 has occured: 0 times in row7
Number: 9 has occured: 0 times in row7
Number: 1 has occured: 3 times in column 0
Number: 2 has occured: 1 times in column 0
Number: 3 has occured: 1 times in column 0
Number: 4 has occured: 2 times in column 0

Number: 5 has occured: 0 times in column 0
Number: 6 has occured: 0 times in column 0
Number: 7 has occured: 0 times in column 0
Number: 8 has occured: 1 times in column 0
Number: 9 has occured: 0 times in column 0
Selecting grid (3x3) 7 from : 20
Total numbers processed so far: 59 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 1
The current coordinate(3x3): (1,1)
Following number chosen: 5
being stored at coordinate(9x9): (7,1)
currently processing this from 3 x 3:(1,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1)
8(6,2) 4(7,0) 5(7,1)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 0 0 0 0 0 0
4 5 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row7
Number: 2 has occured: 0 times in row7
Number: 3 has occured: 0 times in row7
Number: 4 has occured: 1 times in row7
Number: 5 has occured: 1 times in row7
Number: 6 has occured: 0 times in row7
Number: 7 has occured: 0 times in row7
Number: 8 has occured: 0 times in row7
Number: 9 has occured: 0 times in row7
Number: 1 has occured: 0 times in column 1
Number: 2 has occured: 0 times in column 1
Number: 3 has occured: 1 times in column 1
Number: 4 has occured: 1 times in column 1
Number: 5 has occured: 2 times in column 1
Number: 6 has occured: 1 times in column 1
Number: 7 has occured: 2 times in column 1
Number: 8 has occured: 0 times in column 1
Number: 9 has occured: 1 times in column 1
Selecting grid (3x3) 7 from : 20
Total numbers processed so far: 60 out of 81
Current offset in 9x9 grid: 0

Starting in this col in 9 x 9: 2
The current coordinate(3x3): (1,2)
Following number chosen: 9
being stored at coordinate(9x9): (7,2)
currently processing this from 3 x 3:(1,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1)
8(6,2) 4(7,0) 5(7,1) 9(7,2)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 0 0 0 0 0 0
4 5 9 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row7
Number: 2 has occured: 0 times in row7
Number: 3 has occured: 0 times in row7
Number: 4 has occured: 1 times in row7
Number: 5 has occured: 1 times in row7
Number: 6 has occured: 0 times in row7
Number: 7 has occured: 0 times in row7
Number: 8 has occured: 0 times in row7
Number: 9 has occured: 1 times in row7
Number: 1 has occured: 0 times in column 2
Number: 2 has occured: 1 times in column 2
Number: 3 has occured: 0 times in column 2
Number: 4 has occured: 0 times in column 2
Number: 5 has occured: 1 times in column 2
Number: 6 has occured: 1 times in column 2
Number: 7 has occured: 1 times in column 2
Number: 8 has occured: 2 times in column 2
Number: 9 has occured: 2 times in column 2
Selecting grid (3x3) 7 from : 20
Total numbers processed so far: 61 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 0
The current coordinate(3x3): (2,0)
Following number chosen: 3
being stored at coordinate(9x9): (8,0)
currently processing this from 3 x 3:(2,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)

5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1) 8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 0 0 0 0 0 0
4 5 9 0 0 0 0 0 0
3 0 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row8
Number: 2 has occured: 0 times in row8
Number: 3 has occured: 1 times in row8
Number: 4 has occured: 0 times in row8
Number: 5 has occured: 0 times in row8
Number: 6 has occured: 0 times in row8
Number: 7 has occured: 0 times in row8
Number: 8 has occured: 0 times in row8
Number: 9 has occured: 0 times in row8
Number: 1 has occured: 3 times in column 0
Number: 2 has occured: 1 times in column 0
Number: 3 has occured: 2 times in column 0
Number: 4 has occured: 2 times in column 0
Number: 5 has occured: 0 times in column 0
Number: 6 has occured: 0 times in column 0
Number: 7 has occured: 0 times in column 0
Number: 8 has occured: 1 times in column 0
Number: 9 has occured: 0 times in column 0
Selecting grid (3x3) 7 from : 20
Total numbers processed so far: 62 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 1
The current coordinate(3x3): (2,1)
Following number chosen: 2
being stored at coordinate(9x9): (8,1)
currently processing this from 3 x 3:(2,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4) 7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0) 4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5) 5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1) 8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6

1 5 6 5 9 3 9 1 7
1 7 8 0 0 0 0 0 0
4 5 9 0 0 0 0 0 0
3 2 0 0 0 0 0 0 0
Number: 1 has occured: 0 times in row8
Number: 2 has occured: 1 times in row8
Number: 3 has occured: 1 times in row8
Number: 4 has occured: 0 times in row8
Number: 5 has occured: 0 times in row8
Number: 6 has occured: 0 times in row8
Number: 7 has occured: 0 times in row8
Number: 8 has occured: 0 times in row8
Number: 9 has occured: 0 times in row8
Number: 1 has occured: 0 times in column 1
Number: 2 has occured: 1 times in column 1
Number: 3 has occured: 1 times in column 1
Number: 4 has occured: 1 times in column 1
Number: 5 has occured: 2 times in column 1
Number: 6 has occured: 1 times in column 1
Number: 7 has occured: 2 times in column 1
Number: 8 has occured: 0 times in column 1
Number: 9 has occured: 1 times in column 1
Selecting grid (3x3) 7 from : 20
Total numbers processed so far: 63 out of 81
Current offset in 9x9 grid: 0
Starting in this col in 9 x 9: 2
The current coordinate(3x3): (2,2)
Following number chosen: 6
being stored at coordinate(9x9): (8,2)
currently processing this from 3 x 3:(2,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1)
8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 0 0 0 0 0 0
4 5 9 0 0 0 0 0 0
3 2 6 0 0 0 0 0 0
Number: 1 has occured: 0 times in row8
Number: 2 has occured: 1 times in row8
Number: 3 has occured: 1 times in row8
Number: 4 has occured: 0 times in row8

Number: 5 has occured: 0 times in row8
Number: 6 has occured: 1 times in row8
Number: 7 has occured: 0 times in row8
Number: 8 has occured: 0 times in row8
Number: 9 has occured: 0 times in row8
Number: 1 has occured: 0 times in column 2
Number: 2 has occured: 1 times in column 2
Number: 3 has occured: 0 times in column 2
Number: 4 has occured: 0 times in column 2
Number: 5 has occured: 1 times in column 2
Number: 6 has occured: 2 times in column 2
Number: 7 has occured: 1 times in column 2
Number: 8 has occured: 2 times in column 2
Number: 9 has occured: 2 times in column 2
****
****
Selecting grid (3x3) 8 from : 20
Total numbers processed so far: 64 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 3
The current coordinate(3x3): (0,0)
Following number chosen: 7
being stored at coordinate(9x9): (6,3)
currently processing this from 3 x 3:(0,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4) 7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0) 4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5) 5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1) 8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2) 7(6,3)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 7 0 0 0 0 0
4 5 9 0 0 0 0 0 0
3 2 6 0 0 0 0 0 0
Number: 1 has occured: 1 times in row6
Number: 2 has occured: 0 times in row6
Number: 3 has occured: 0 times in row6
Number: 4 has occured: 0 times in row6
Number: 5 has occured: 0 times in row6
Number: 6 has occured: 0 times in row6
Number: 7 has occured: 2 times in row6
Number: 8 has occured: 1 times in row6
Number: 9 has occured: 0 times in row6
Number: 1 has occured: 2 times in column 3

Number: 2 has occured: 0 times in column 3
Number: 3 has occured: 1 times in column 3
Number: 4 has occured: 1 times in column 3
Number: 5 has occured: 1 times in column 3
Number: 6 has occured: 0 times in column 3
Number: 7 has occured: 2 times in column 3
Number: 8 has occured: 0 times in column 3
Number: 9 has occured: 0 times in column 3
Selecting grid (3x3) 8 from : 20
Total numbers processed so far: 65 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 4
The current coordinate(3x3): (0,1)
Following number chosen: 1
being stored at coordinate(9x9): (6,4)
currently processing this from 3 x 3:(0,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1)
8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2) 7(6,3) 1(6,4)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 7 1 0 0 0 0
4 5 9 0 0 0 0 0 0
3 2 6 0 0 0 0 0 0
Number: 1 has occured: 2 times in row6
Number: 2 has occured: 0 times in row6
Number: 3 has occured: 0 times in row6
Number: 4 has occured: 0 times in row6
Number: 5 has occured: 0 times in row6
Number: 6 has occured: 0 times in row6
Number: 7 has occured: 2 times in row6
Number: 8 has occured: 1 times in row6
Number: 9 has occured: 0 times in row6
Number: 1 has occured: 1 times in column 4
Number: 2 has occured: 0 times in column 4
Number: 3 has occured: 0 times in column 4
Number: 4 has occured: 0 times in column 4
Number: 5 has occured: 1 times in column 4
Number: 6 has occured: 2 times in column 4
Number: 7 has occured: 0 times in column 4
Number: 8 has occured: 1 times in column 4
Number: 9 has occured: 2 times in column 4

Selecting grid (3x3) 8 from : 20
Total numbers processed so far: 66 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 5
The current coordinate(3x3): (0,2)
Following number chosen: 6
being stored at coordinate(9x9): (6,5)
currently processing this from 3 x 3:(0,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4) 7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0) 4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5) 5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1) 8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2) 7(6,3) 1(6,4) 6(6,5)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 7 1 6 0 0 0
4 5 9 0 0 0 0 0 0
3 2 6 0 0 0 0 0 0
Number: 1 has occured: 2 times in row6
Number: 2 has occured: 0 times in row6
Number: 3 has occured: 0 times in row6
Number: 4 has occured: 0 times in row6
Number: 5 has occured: 0 times in row6
Number: 6 has occured: 1 times in row6
Number: 7 has occured: 2 times in row6
Number: 8 has occured: 1 times in row6
Number: 9 has occured: 0 times in row6
Number: 1 has occured: 0 times in column 5
Number: 2 has occured: 2 times in column 5
Number: 3 has occured: 1 times in column 5
Number: 4 has occured: 1 times in column 5
Number: 5 has occured: 0 times in column 5
Number: 6 has occured: 1 times in column 5
Number: 7 has occured: 1 times in column 5
Number: 8 has occured: 1 times in column 5
Number: 9 has occured: 0 times in column 5
Selecting grid (3x3) 8 from : 20
Total numbers processed so far: 67 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 3
The current coordinate(3x3): (1,0)
Following number chosen: 4
being stored at coordinate(9x9): (7,3)
currently processing this from 3 x 3:(1,0)

4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1)
8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2) 7(6,3) 1(6,4) 6(6,5) 4(7,3)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 7 1 6 0 0 0
4 5 9 4 0 0 0 0 0
3 2 6 0 0 0 0 0 0
Number: 1 has occured: 0 times in row7
Number: 2 has occured: 0 times in row7
Number: 3 has occured: 0 times in row7
Number: 4 has occured: 2 times in row7
Number: 5 has occured: 1 times in row7
Number: 6 has occured: 0 times in row7
Number: 7 has occured: 0 times in row7
Number: 8 has occured: 0 times in row7
Number: 9 has occured: 1 times in row7
Number: 1 has occured: 2 times in column 3
Number: 2 has occured: 0 times in column 3
Number: 3 has occured: 1 times in column 3
Number: 4 has occured: 2 times in column 3
Number: 5 has occured: 1 times in column 3
Number: 6 has occured: 0 times in column 3
Number: 7 has occured: 2 times in column 3
Number: 8 has occured: 0 times in column 3
Number: 9 has occured: 0 times in column 3
Selecting grid (3x3) 8 from : 20
Total numbers processed so far: 68 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 4
The current coordinate(3x3): (1,1)
Following number chosen: 8
being stored at coordinate(9x9): (7,4)
currently processing this from 3 x 3:(1,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1)
8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2) 7(6,3) 1(6,4) 6(6,5) 4(7,3) 8(7,4)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6

2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 7 1 6 0 0 0
4 5 9 4 8 0 0 0 0
3 2 6 0 0 0 0 0 0
Number: 1 has occured: 0 times in row7
Number: 2 has occured: 0 times in row7
Number: 3 has occured: 0 times in row7
Number: 4 has occured: 2 times in row7
Number: 5 has occured: 1 times in row7
Number: 6 has occured: 0 times in row7
Number: 7 has occured: 0 times in row7
Number: 8 has occured: 1 times in row7
Number: 9 has occured: 1 times in row7
Number: 1 has occured: 1 times in column 4
Number: 2 has occured: 0 times in column 4
Number: 3 has occured: 0 times in column 4
Number: 4 has occured: 0 times in column 4
Number: 5 has occured: 1 times in column 4
Number: 6 has occured: 2 times in column 4
Number: 7 has occured: 0 times in column 4
Number: 8 has occured: 2 times in column 4
Number: 9 has occured: 2 times in column 4
Selecting grid (3x3) 8 from : 20
Total numbers processed so far: 69 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 5
The current coordinate(3x3): (1,2)
Following number chosen: 5
being stored at coordinate(9x9): (7,5)
currently processing this from 3 x 3:(1,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1)
8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2) 7(6,3) 1(6,4) 6(6,5) 4(7,3) 8(7,4) 5(7,5)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 7 1 6 0 0 0
4 5 9 4 8 5 0 0 0
3 2 6 0 0 0 0 0 0
Number: 1 has occured: 0 times in row7

Number: 2 has occured: 0 times in row7
Number: 3 has occured: 0 times in row7
Number: 4 has occured: 2 times in row7
Number: 5 has occured: 2 times in row7
Number: 6 has occured: 0 times in row7
Number: 7 has occured: 0 times in row7
Number: 8 has occured: 1 times in row7
Number: 9 has occured: 1 times in row7
Number: 1 has occured: 0 times in column 5
Number: 2 has occured: 2 times in column 5
Number: 3 has occured: 1 times in column 5
Number: 4 has occured: 1 times in column 5
Number: 5 has occured: 1 times in column 5
Number: 6 has occured: 1 times in column 5
Number: 7 has occured: 1 times in column 5
Number: 8 has occured: 1 times in column 5
Number: 9 has occured: 0 times in column 5
Selecting grid (3x3) 8 from : 20
Total numbers processed so far: 70 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 3
The current coordinate(3x3): (2,0)
Following number chosen: 9
being stored at coordinate(9x9): (8,3)
currently processing this from 3 x 3:(2,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1)
8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2) 7(6,3) 1(6,4) 6(6,5) 4(7,3) 8(7,4) 5(7,5) 9(8,3)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 7 1 6 0 0 0
4 5 9 4 8 5 0 0 0
3 2 6 9 0 0 0 0 0
Number: 1 has occured: 0 times in row8
Number: 2 has occured: 1 times in row8
Number: 3 has occured: 1 times in row8
Number: 4 has occured: 0 times in row8
Number: 5 has occured: 0 times in row8
Number: 6 has occured: 1 times in row8
Number: 7 has occured: 0 times in row8
Number: 8 has occured: 0 times in row8
Number: 9 has occured: 1 times in row8

Number: 1 has occured: 2 times in column 3
Number: 2 has occured: 0 times in column 3
Number: 3 has occured: 1 times in column 3
Number: 4 has occured: 2 times in column 3
Number: 5 has occured: 1 times in column 3
Number: 6 has occured: 0 times in column 3
Number: 7 has occured: 2 times in column 3
Number: 8 has occured: 0 times in column 3
Number: 9 has occured: 1 times in column 3
Selecting grid (3x3) 8 from : 20
Total numbers processed so far: 71 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 4
The current coordinate(3x3): (2,1)
Following number chosen: 3
being stored at coordinate(9x9): (8,4)
currently processing this from 3 x 3:(2,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1)
8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2) 7(6,3) 1(6,4) 6(6,5) 4(7,3) 8(7,4) 5(7,5) 9(8,3)
3(8,4)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 7 1 6 0 0 0
4 5 9 4 8 5 0 0 0
3 2 6 9 3 0 0 0 0
Number: 1 has occured: 0 times in row8
Number: 2 has occured: 1 times in row8
Number: 3 has occured: 2 times in row8
Number: 4 has occured: 0 times in row8
Number: 5 has occured: 0 times in row8
Number: 6 has occured: 1 times in row8
Number: 7 has occured: 0 times in row8
Number: 8 has occured: 0 times in row8
Number: 9 has occured: 1 times in row8
Number: 1 has occured: 1 times in column 4
Number: 2 has occured: 0 times in column 4
Number: 3 has occured: 1 times in column 4
Number: 4 has occured: 0 times in column 4
Number: 5 has occured: 1 times in column 4
Number: 6 has occured: 2 times in column 4
Number: 7 has occured: 0 times in column 4

Number: 8 has occured: 2 times in column 4
Number: 9 has occured: 2 times in column 4
Selecting grid (3x3) 8 from : 20
Total numbers processed so far: 72 out of 81
Current offset in 9x9 grid: 3
Starting in this col in 9 x 9: 5
The current coordinate(3x3): (2,2)
Following number chosen: 2
being stored at coordinate(9x9): (8,5)
currently processing this from 3 x 3:(2,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4) 7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0) 4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5) 5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1) 8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2) 7(6,3) 1(6,4) 6(6,5) 4(7,3) 8(7,4) 5(7,5) 9(8,3) 3(8,4) 2(8,5)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 7 1 6 0 0 0
4 5 9 4 8 5 0 0 0
3 2 6 9 3 2 0 0 0
Number: 1 has occured: 0 times in row8
Number: 2 has occured: 2 times in row8
Number: 3 has occured: 2 times in row8
Number: 4 has occured: 0 times in row8
Number: 5 has occured: 0 times in row8
Number: 6 has occured: 1 times in row8
Number: 7 has occured: 0 times in row8
Number: 8 has occured: 0 times in row8
Number: 9 has occured: 1 times in row8
Number: 1 has occured: 0 times in column 5
Number: 2 has occured: 3 times in column 5
Number: 3 has occured: 1 times in column 5
Number: 4 has occured: 1 times in column 5
Number: 5 has occured: 1 times in column 5
Number: 6 has occured: 1 times in column 5
Number: 7 has occured: 1 times in column 5
Number: 8 has occured: 1 times in column 5
Number: 9 has occured: 0 times in column 5
****
****
Selecting grid (3x3) 9 from : 20
Total numbers processed so far: 73 out of 81
Current offset in 9x9 grid: 6

Starting in this col in 9 x 9: 6
The current coordinate(3x3): (0,0)
Following number chosen: 8
being stored at coordinate(9x9): (6,6)
currently processing this from 3 x 3:(0,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1)
8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2) 7(6,3) 1(6,4) 6(6,5) 4(7,3) 8(7,4) 5(7,5) 9(8,3)
3(8,4) 2(8,5) 8(6,6)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 7 1 6 8 0 0
4 5 9 4 8 5 0 0 0
3 2 6 9 3 2 0 0 0
Number: 1 has occured: 2 times in row6
Number: 2 has occured: 0 times in row6
Number: 3 has occured: 0 times in row6
Number: 4 has occured: 0 times in row6
Number: 5 has occured: 0 times in row6
Number: 6 has occured: 1 times in row6
Number: 7 has occured: 2 times in row6
Number: 8 has occured: 2 times in row6
Number: 9 has occured: 0 times in row6
Number: 1 has occured: 0 times in column 6
Number: 2 has occured: 2 times in column 6
Number: 3 has occured: 0 times in column 6
Number: 4 has occured: 2 times in column 6
Number: 5 has occured: 0 times in column 6
Number: 6 has occured: 0 times in column 6
Number: 7 has occured: 0 times in column 6
Number: 8 has occured: 2 times in column 6
Number: 9 has occured: 1 times in column 6
Selecting grid (3x3) 9 from : 20
Total numbers processed so far: 74 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 7
The current coordinate(3x3): (0,1)
Following number chosen: 4
being stored at coordinate(9x9): (6,7)
currently processing this from 3 x 3:(0,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)

4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1)
8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2) 7(6,3) 1(6,4) 6(6,5) 4(7,3) 8(7,4) 5(7,5) 9(8,3)
3(8,4) 2(8,5) 8(6,6) 4(6,7)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 7 1 6 8 4 0
4 5 9 4 8 5 0 0 0
3 2 6 9 3 2 0 0 0
Number: 1 has occured: 2 times in row6
Number: 2 has occured: 0 times in row6
Number: 3 has occured: 0 times in row6
Number: 4 has occured: 1 times in row6
Number: 5 has occured: 0 times in row6
Number: 6 has occured: 1 times in row6
Number: 7 has occured: 2 times in row6
Number: 8 has occured: 2 times in row6
Number: 9 has occured: 0 times in row6
Number: 1 has occured: 1 times in column 7
Number: 2 has occured: 0 times in column 7
Number: 3 has occured: 2 times in column 7
Number: 4 has occured: 1 times in column 7
Number: 5 has occured: 1 times in column 7
Number: 6 has occured: 0 times in column 7
Number: 7 has occured: 1 times in column 7
Number: 8 has occured: 1 times in column 7
Number: 9 has occured: 0 times in column 7
Selecting grid (3x3) 9 from : 20
Total numbers processed so far: 75 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 8
The current coordinate(3x3): (0,2)
Following number chosen: 3
being stored at coordinate(9x9): (6,8)
currently processing this from 3 x 3:(0,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1)
8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2) 7(6,3) 1(6,4) 6(6,5) 4(7,3) 8(7,4) 5(7,5) 9(8,3)
3(8,4) 2(8,5) 8(6,6) 4(6,7) 3(6,8)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6

2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 7 1 6 8 4 3
4 5 9 4 8 5 0 0 0
3 2 6 9 3 2 0 0 0
Number: 1 has occured: 2 times in row6
Number: 2 has occured: 0 times in row6
Number: 3 has occured: 1 times in row6
Number: 4 has occured: 1 times in row6
Number: 5 has occured: 0 times in row6
Number: 6 has occured: 1 times in row6
Number: 7 has occured: 2 times in row6
Number: 8 has occured: 2 times in row6
Number: 9 has occured: 0 times in row6
Number: 1 has occured: 1 times in column 8
Number: 2 has occured: 0 times in column 8
Number: 3 has occured: 1 times in column 8
Number: 4 has occured: 0 times in column 8
Number: 5 has occured: 1 times in column 8
Number: 6 has occured: 2 times in column 8
Number: 7 has occured: 1 times in column 8
Number: 8 has occured: 0 times in column 8
Number: 9 has occured: 1 times in column 8
Selecting grid (3x3) 9 from : 20
Total numbers processed so far: 76 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 6
The current coordinate(3x3): (1,0)
Following number chosen: 5
being stored at coordinate(9x9): (7,6)
currently processing this from 3 x 3:(1,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1)
8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2) 7(6,3) 1(6,4) 6(6,5) 4(7,3) 8(7,4) 5(7,5) 9(8,3)
3(8,4) 2(8,5) 8(6,6) 4(6,7) 3(6,8) 5(7,6)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 7 1 6 8 4 3
4 5 9 4 8 5 5 0 0
3 2 6 9 3 2 0 0 0

Number: 1 has occured: 0 times in row7
Number: 2 has occured: 0 times in row7
Number: 3 has occured: 0 times in row7
Number: 4 has occured: 2 times in row7
Number: 5 has occured: 3 times in row7
Number: 6 has occured: 0 times in row7
Number: 7 has occured: 0 times in row7
Number: 8 has occured: 1 times in row7
Number: 9 has occured: 1 times in row7
Number: 1 has occured: 0 times in column 6
Number: 2 has occured: 2 times in column 6
Number: 3 has occured: 0 times in column 6
Number: 4 has occured: 2 times in column 6
Number: 5 has occured: 1 times in column 6
Number: 6 has occured: 0 times in column 6
Number: 7 has occured: 0 times in column 6
Number: 8 has occured: 2 times in column 6
Number: 9 has occured: 1 times in column 6
Selecting grid (3x3) 9 from : 20
Total numbers processed so far: 77 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 7
The current coordinate(3x3): (1,1)
Following number chosen: 9
being stored at coordinate(9x9): (7,7)
currently processing this from 3 x 3:(1,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1)
8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2) 7(6,3) 1(6,4) 6(6,5) 4(7,3) 8(7,4) 5(7,5) 9(8,3)
3(8,4) 2(8,5) 8(6,6) 4(6,7) 3(6,8) 5(7,6) 9(7,7)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 7 1 6 8 4 3
4 5 9 4 8 5 5 9 0
3 2 6 9 3 2 0 0 0
Number: 1 has occured: 0 times in row7
Number: 2 has occured: 0 times in row7
Number: 3 has occured: 0 times in row7
Number: 4 has occured: 2 times in row7
Number: 5 has occured: 3 times in row7
Number: 6 has occured: 0 times in row7
Number: 7 has occured: 0 times in row7

Number: 8 has occured: 1 times in row7
Number: 9 has occured: 2 times in row7
Number: 1 has occured: 1 times in column 7
Number: 2 has occured: 0 times in column 7
Number: 3 has occured: 2 times in column 7
Number: 4 has occured: 1 times in column 7
Number: 5 has occured: 1 times in column 7
Number: 6 has occured: 0 times in column 7
Number: 7 has occured: 1 times in column 7
Number: 8 has occured: 1 times in column 7
Number: 9 has occured: 1 times in column 7
Selecting grid (3x3) 9 from : 20
Total numbers processed so far: 78 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 8
The current coordinate(3x3): (1,2)
Following number chosen: 1
being stored at coordinate(9x9): (7,8)
currently processing this from 3 x 3:(1,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1)
8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2) 7(6,3) 1(6,4) 6(6,5) 4(7,3) 8(7,4) 5(7,5) 9(8,3)
3(8,4) 2(8,5) 8(6,6) 4(6,7) 3(6,8) 5(7,6) 9(7,7) 1(7,8)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 7 1 6 8 4 3
4 5 9 4 8 5 5 9 1
3 2 6 9 3 2 0 0 0
Number: 1 has occured: 1 times in row7
Number: 2 has occured: 0 times in row7
Number: 3 has occured: 0 times in row7
Number: 4 has occured: 2 times in row7
Number: 5 has occured: 3 times in row7
Number: 6 has occured: 0 times in row7
Number: 7 has occured: 0 times in row7
Number: 8 has occured: 1 times in row7
Number: 9 has occured: 2 times in row7
Number: 1 has occured: 2 times in column 8
Number: 2 has occured: 0 times in column 8
Number: 3 has occured: 1 times in column 8
Number: 4 has occured: 0 times in column 8
Number: 5 has occured: 1 times in column 8

Number: 6 has occured: 2 times in column 8
Number: 7 has occured: 1 times in column 8
Number: 8 has occured: 0 times in column 8
Number: 9 has occured: 1 times in column 8
Selecting grid (3x3) 9 from : 20
Total numbers processed so far: 79 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 6
The current coordinate(3x3): (2,0)
Following number chosen: 2
being stored at coordinate(9x9): (8,6)
currently processing this from 3 x 3:(2,0)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1)
8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2) 7(6,3) 1(6,4) 6(6,5) 4(7,3) 8(7,4) 5(7,5) 9(8,3)
3(8,4) 2(8,5) 8(6,6) 4(6,7) 3(6,8) 5(7,6) 9(7,7) 1(7,8) 2(8,6)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 7 1 6 8 4 3
4 5 9 4 8 5 5 9 1
3 2 6 9 3 2 2 0 0
Number: 1 has occured: 0 times in row8
Number: 2 has occured: 3 times in row8
Number: 3 has occured: 2 times in row8
Number: 4 has occured: 0 times in row8
Number: 5 has occured: 0 times in row8
Number: 6 has occured: 1 times in row8
Number: 7 has occured: 0 times in row8
Number: 8 has occured: 0 times in row8
Number: 9 has occured: 1 times in row8
Number: 1 has occured: 0 times in column 6
Number: 2 has occured: 3 times in column 6
Number: 3 has occured: 0 times in column 6
Number: 4 has occured: 2 times in column 6
Number: 5 has occured: 1 times in column 6
Number: 6 has occured: 0 times in column 6
Number: 7 has occured: 0 times in column 6
Number: 8 has occured: 2 times in column 6
Number: 9 has occured: 1 times in column 6
Selecting grid (3x3) 9 from : 20
Total numbers processed so far: 80 out of 81
Current offset in 9x9 grid: 6

Starting in this col in 9 x 9: 7
The current coordinate(3x3): (2,1)
Following number chosen: 6
being stored at coordinate(9x9): (8,7)
currently processing this from 3 x 3:(2,1)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)
4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5)
5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1)
8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2) 7(6,3) 1(6,4) 6(6,5) 4(7,3) 8(7,4) 5(7,5) 9(8,3)
3(8,4) 2(8,5) 8(6,6) 4(6,7) 3(6,8) 5(7,6) 9(7,7) 1(7,8) 2(8,6) 6(8,7)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 7 1 6 8 4 3
4 5 9 4 8 5 5 9 1
3 2 6 9 3 2 2 6 0
Number: 1 has occured: 0 times in row8
Number: 2 has occured: 3 times in row8
Number: 3 has occured: 2 times in row8
Number: 4 has occured: 0 times in row8
Number: 5 has occured: 0 times in row8
Number: 6 has occured: 2 times in row8
Number: 7 has occured: 0 times in row8
Number: 8 has occured: 0 times in row8
Number: 9 has occured: 1 times in row8
Number: 1 has occured: 1 times in column 7
Number: 2 has occured: 0 times in column 7
Number: 3 has occured: 2 times in column 7
Number: 4 has occured: 1 times in column 7
Number: 5 has occured: 1 times in column 7
Number: 6 has occured: 1 times in column 7
Number: 7 has occured: 1 times in column 7
Number: 8 has occured: 1 times in column 7
Number: 9 has occured: 1 times in column 7
Selecting grid (3x3) 9 from : 20
Total numbers processed so far: 81 out of 81
Current offset in 9x9 grid: 6
Starting in this col in 9 x 9: 8
The current coordinate(3x3): (2,2)
Following number chosen: 7
being stored at coordinate(9x9): (8,8)
currently processing this from 3 x 3:(2,2)
4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4)
7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0)

4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5) 5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1) 8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2) 7(6,3) 1(6,4) 6(6,5) 4(7,3) 8(7,4) 5(7,5) 9(8,3) 3(8,4) 2(8,5) 8(6,6) 4(6,7) 3(6,8) 5(7,6) 9(7,7) 1(7,8) 2(8,6) 6(8,7) 7(8,8)
FILLING BOARD
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 7 1 6 8 4 3
4 5 9 4 8 5 5 9 1
3 2 6 9 3 2 2 6 7
Number: 1 has occured: 0 times in row8
Number: 2 has occured: 3 times in row8
Number: 3 has occured: 2 times in row8
Number: 4 has occured: 0 times in row8
Number: 5 has occured: 0 times in row8
Number: 6 has occured: 2 times in row8
Number: 7 has occured: 1 times in row8
Number: 8 has occured: 0 times in row8
Number: 9 has occured: 1 times in row8
Number: 1 has occured: 2 times in column 8
Number: 2 has occured: 0 times in column 8
Number: 3 has occured: 1 times in column 8
Number: 4 has occured: 0 times in column 8
Number: 5 has occured: 1 times in column 8
Number: 6 has occured: 2 times in column 8
Number: 7 has occured: 2 times in column 8
Number: 8 has occured: 0 times in column 8
Number: 9 has occured: 1 times in column 8

This is your board number 2 summary: 4(0,0) 3(0,1) 8(0,2) 1(1,0) 7(1,1) 5(1,2) 2(2,0) 6(2,1) 9(2,2) 1(0,3) 5(0,4) 2(0,5) 3(1,3) 9(1,4) 7(1,5) 4(2,3) 6(2,4) 8(2,5) 4(0,6) 3(0,7) 1(0,8) 2(1,6) 5(1,7) 6(1,8) 8(2,6) 7(2,7) 9(2,8) 8(3,0) 4(3,1) 2(3,2) 3(4,0) 9(4,1) 7(4,2) 1(5,0) 5(5,1) 6(5,2) 1(3,3) 6(3,4) 4(3,5) 7(4,3) 8(4,4) 2(4,5) 5(5,3) 9(5,4) 3(5,5) 4(3,6) 8(3,7) 5(3,8) 2(4,6) 3(4,7) 6(4,8) 9(5,6) 1(5,7) 7(5,8) 1(6,0) 7(6,1) 8(6,2) 4(7,0) 5(7,1) 9(7,2) 3(8,0) 2(8,1) 6(8,2) 7(6,3) 1(6,4) 6(6,5) 4(7,3) 8(7,4) 5(7,5) 9(8,3) 3(8,4) 2(8,5) 8(6,6) 4(6,7) 3(6,8) 5(7,6) 9(7,7) 1(7,8) 2(8,6) 6(8,7) 7(8,8)
****
Better luck next time, failed on board: 2
4 3 8 1 5 2 4 3 1
1 7 5 3 9 7 2 5 6
2 6 9 4 6 8 8 7 9
8 4 2 1 6 4 4 8 5
3 9 7 7 8 2 2 3 6
1 5 6 5 9 3 9 1 7
1 7 8 7 1 6 8 4 3

4 5 9 4 8 5 5 9 1
3 2 6 9 3 2 2 6 7
****

Moving onto Board Number: 3
****

** Process exited - Return Code: 0 **

CODE WITH SCREEN OUTPUTS REMOVED **

```
/*
Online Java - IDE, Code Editor, Compiler
Online Java is a quick and easy tool that helps you to build, compile, test your programs online.
*/
// This has been created to ensure I can utilize any random functions more efficiently.
// It is a creation of the nPr permutation calculator.
// It has used techniques I learnt including recursion and also memoization to speed up execution.
// I will incorporate this into Java applications I created

//TEST CASES
//Difficult to produce..


// With lots trying, there is a major issue in trying to get the numbers back out of an int[][] that
// have been stored in list (copied from Map).
//For some reason, it is able to show values in Map.get (using the key which is simply the pos of 3x3 grid in it).
//I can process all int[] in the value, and see them as Array list...

//I have tried everything in my capacity to make these numbers visible, but it has not worked:
//This includes adding the miniGrid to a 3D array and processing...
//running nested loop to get each number from array and storing in another 2D array.
//simply running  System.out.println miniGrid[0][0]  up to [2][2],  but the output is non-consistent
//with what is being stored...
// I have also included commented code (for loop initialisation) and also setting temp based on this, but
//its irrelevant given above situation...

//Complete forgot to set temp = mp.get(i)!!!!
//Need to try this first.....  (THIS HAS ALSO FAILED!!!!!)
```

// The only left technique is using the Set<String> s = new HashSet() since the String of unique permutation
//was written here at the time that a unique permutation acquired.

//It will be attempted to extract the numbers from the String using String Tokenizer. Cast them to Int....
//This will then be added into a int [][] and stored into temp, and it will try fill9x9grid again....
//This will preserve my hard coded logic of rowIndex, colIndex, colCount, rowCount.....
// THIS HAS WORKED....

//also didn't need three if statements for setting offset...
// could have used if totalNumbersProcessed = 0 (offset0) , 9 (offset3), 18(ofset 6), 27 (offset 0), 24, 43,51, 60, 69, 76,83,90

// FINISHED - FILLING GRID.. GIVING SCREEN OUTPUT OF NUMBER TIMES NUMBER HAS APPEARED...

//I HAVE NOT USED TOKENIZER, ALTHOUGH THIS WAS OPTION...
//SINCE THE , SEPARATED THE VALUES IN 3x3 GRID, I SIMPLY DID INCREMENT i=i+2
//TO MAKE CODE MORE PROFESSIONAL, THIS CAN BE ADDRESSED IN THE FUTURE....

//**** NOT REQUIRED ***
//if it fails, only option is to change the fill9x9 grid to execute via String.charAt()..... So logic change will
//be required of the code.....
//colIndex and rowIndex will remain.....
// colCount and rowCount will be affected since 3x3 grids no longer on [3][3], but logic can be twisted!

//*** UP TO HERE ***
//NOW NEED TO CHECK BEST POINT TO CHECK FOR UNIQUE ROWS AND UNIQUE COLUMNS....
//EASIEST WAY IS TO CHECK BY DUPLICATION OF A NUMBER IN EACH DIRECTION...
//I CAN THEN FOLLOW MY PSEUDO CODE AS PLANNED TO POPULATE THE GRID!!!!!!
//JUST FUCKING HOPE THE BOARDS ARE BEING STORED CORRECTLY WHEN FINISHED/
//OTHERWISE WILL NEED TO IMPLEMENT A METHOD TO FORMAT THE 81 NUMBERS PROPERLY
//IT SHOULDNT BE TOO DIFFICULT SINCE THE BOARD SUMMARY HAS VALUE AND ALSO CO-ORDINATES... SO JUST PLACE THEM BACK

//IT FILLED 9x9,

//how to process rowcheck

```
//use switch
//case totalNumbersProcessed =9

//how to process column check

import java.math.*;   //KEEP
import java.util.*;        //KEEP
import java.util.stream.*;   //KEEP

interface Fillable   //KEEP
{  //KEEP
   public void fill3x3Manual();  //KEEP: Method failed. Tried to populate list manually with strings to see if a solution can be reached..
   public void fill3x3();  //KEEP:  method to fill 3x3 grids...
   public void fill9x9(Map<Integer, int[][]> mp);  // KEEP: fills the full board...
   public boolean checkUniqueRows(int [][] temp, int rowIndex);  //checks if row is unique..
   public boolean checkUniqueColumns(int[][] nineByNine, int colIndex); //checks if column is unique..
   public boolean sudokuComplete(boolean a, boolean b);  //checks if valid grid based on the above...
   public void get9x9Grid();  //experimental, trying to recover information from collections, but fails....
   public void get3x3Grid();   //largely experimental, but it also has loop to show rows of two dimensional matrix of
   public void wipe9x9Board(int[][] formattedBoard, int[][] nineByNine);  //wipes board, formattedBoard(derived from strings to ints) and ninebynine getting values from temp array.
   public void print9x9Board(String history, int numComplete9x9Boards); //keeps log of all completedBoards
   public int convertStringTo3x3(String permutations3x3, int getNumString); //it takes string from set of permutations and puts it into a int[3][3] array
   public void realTime9x9Fill(String history);  // this shows how the grid is filling and impact on numbers in row and col
   public void display9x9(); // this will show the 9x9 onto the screen.....

}

class nineByNine
{

   int test;

   public nineByNine()
   {
      //initial state nineByNine grid

         //int nineByNineCopy[][] = nineByNine.clone();
         // I intened to use this so that it can be restored again once board is complete..
         // but had issues and it never seemed to work...
```

```
        //so just manually set 0's back in.....
    }
}

class Sudoku implements Fillable
{
    Map<Integer, int[][]> mp = new HashMap();  //this will hold all the indexes....

    int possibleNumbers[] = new int[]{1,2,3,4,5,6,7,8,9};  //all possible numbers

    List<Integer> lst = new ArrayList<Integer>();  // list will be used to hold all numbers above for selection...

    int MiniTest[][] = new int[3][3];  //used for testing, storing values....
    int formattedBoard[][] = new int [9][9];   // this will hold numbers retrieved from string of board summary...

  Map<Integer, int[][]> completedBoards = new HashMap<>();  //All completed boards stored here...
  int numComplete9x9Boards=1;   //number completed 9x9 boards....

  StringJoiner sj1 = new StringJoiner(",");  // initialised first time.....
  //This will be used to get values from formattedBoard row by row...
  //It is used for screenoutput of the entire 9x9 structure....


 // I was thinking about introducing new nineByNine class, but couldn't see real purpose..
 // This would be ideal if I did evenutally moved onto area of testing partially filled 9 by 9 grid
 // to keep logic separate..

//nineByNine [] nbn = new nineByNine[5000]; // is it best way to create an array on nineByNine classes...
//nbn[0]= new nineByNine();


    int [][] nineByNine = new int[][]{      {0,0,0,0,0,0,0,0,0},
                                    {0,0,0,0,0,0,0,0,0},
                                    {0,0,0,0,0,0,0,0,0},
                                    {0,0,0,0,0,0,0,0,0},
                                    {0,0,0,0,0,0,0,0,0},
                                    {0,0,0,0,0,0,0,0,0},
                                    {0,0,0,0,0,0,0,0,0},
                                    {0,0,0,0,0,0,0,0,0},
                                    {0,0,0,0,0,0,0,0,0} };


   int totalNumbersProcessed=1;   ///ranging from 1-81
```

```
   long permutations;   // all permutations retrieved from the driver class....
   String Permutations3x3into9x9;   // holds value of all permutations arranging 9 grids from 362800


   int threeBythree[][] = new int[3][3];   // will pass numbers into the map...
   //Set <Integer[][]> s = new HashSet<>();  // used as part of experimention as documented...


   Set<String> s = new HashSet();   //stores all the strings of permutations


   Set<String> copyPermuations = new HashSet(s);
   //copy of main Set, this was intended to be used if for instance one 3x3 selected, it could not be used
   //again since each 3x3 grid is unique in 9x9... But became highly irrelevant reducing 362800 by 1 each time


   StringJoiner sj;      //used to format the string added into the set...
   int storeMiniGrids[][][];  // used for testing....

   int currentSize;  //gets current size of the set
   int newSize;  //gets new size of the set....
   int[][] miniGrid;     // this is used to get value out of the map....
   int[][][] miniGridContainer;  //used to store the minigrids into 3d array (part of learning)

   List<Integer> copy = new ArrayList<>(lst);  //mantain original list of possibleNumbers...
   //useful once listed has been emptied and restore it back...

   boolean endFirstRow3x3=false;  //used to ascertain if reached end of row for 3x3 grid...
   Random rand = new Random();   // instance for generating random number....

   String[] completedBoardsLogs = new String[10000];
   //This will store boards in the format:
   //8(0,0) 7(0,1) 1(0,2) 5(1,0) 2(1,1) 9(1,2) 4(2,0) 3(2,1) 6(2,2) 5(0,3) 8(0,4) 9(0,5) 6(1,3) 4(1,4) 7(1,5) 2(2,3) 3(2,4) 1(2,5) 5(0,6) 6(0,7) 4(0,8) 3(1,6) 8(1,7) 1(1,8) 7(2,6) 2(2,7) 9(2,8) 1(3,0) 7(3,1) 4(3,2) 3(4,0) 5(4,1) 6(4,2) 9(5,0) 8(5,1) 2(5,2) 5(3,3) 1(3,4) 8(3,5) 7(4,3) 3(4,4) 2(4,5) 9(5,3) 6(5,4) 4(5,5) 9(3,6) 5(3,7) 3(3,8) 7(4,6) 1(4,7) 8(4,8) 2(5,6) 4(5,7) 6(5,8) 3(6,0) 6(6,1) 2(6,2) 1(7,0) 4(7,1) 9(7,2) 7(8,0) 8(8,1) 5(8,2) 4(6,3) 3(6,4) 2(6,5) 7(7,3) 6(7,4) 5(7,5) 9(8,3) 1(8,4) 8(8,5) 4(6,6) 1(6,7) 7(6,8) 6(7,6) 5(7,7) 3(7,8) 2(8,6) 8(8,7) 9(8,8)
   //Java or any platform will not allow an array as large as required for storing successful arrangements of 9x9 grids,
   //let alone the all permutations of 9x9 grids
   // 6,670,903,752,021,072,936,960

   int count=0;   // used in print9x9Board()  for completedBoardsLogs[count]
```

```
   int rowIndex=0;  // used for the  row on 9x9 grid
   int colIndex=0;  // used for the  col on 9x9 grid


   int randomNumber1to9List;  //  holds value of  possibleNumbers generated from
lst.get(randomNumber)

   boolean failedColumns;  //passed into sudokuComplete
   boolean failedRows;    //passed into sudokuComplete
   boolean sudokuSuccess;  //this was used for ADVANCE pseudocode,
   //when trying to deal with situation such as getting a success 9x9 grid or failed grid.
   //But it needs too much thought on how to code for high permutations..


   public void wipe9x9Board(int [][]formattedBoard, int nineByNine[][])
   {
      //System.out.println("GET ING HERE !!!!!");
      //System.out.println("before:" + nineByNine[8][8]);
      //formattedBoard = nineByNineCopy.clone();
      //nineByNine = nineByNineCopy.clone();

      //fill each index with 0....

         for (int q=0; q<nineByNine.length; q++)    //can use temp here or also the blank 9x9
grid with 0, same size...
         {
            for (int r=0; r<nineByNine[0].length; r++)

            {
               formattedBoard[q][r]=0;     // wipes buffer, getting numbers from set with string
permutations
               nineByNine[q][r]=0;  // clears 9 x 9 grid. (before it is stored)...
            }

         }
         //System.out.println("after" + nineByNine[8][8]);

   }

  //constructor:
   public Sudoku(long permutations, String  Permutations3x3into9x9)
   {
      this.permutations =permutations;
      this.Permutations3x3into9x9=Permutations3x3into9x9;


   fill3x3();

   //if end user wants to fill grids manually, they can attempt this and comment top one...
```

```
    //But there are issues at moment..
    //fill3x3Manual();

    }


   //This is passed into method below
   //perm3x3[entry3x3],      getnum: 0
   //perm3x3[entry3x3],    getnum: 2...
   //perm3x3[entry3x3],    getnum: 12

   //perm3x3 is getting information from string array (taking all permutation values in the
list)
   //entry3x3  -  this ranges from  0-size of the set
   //it increments each time a set it used..
    //since perm3x3 is formattted as such  1,2,3,4,5,6,7,8,9    getnum has to alterate from
index 0,2,4....

    public int convertStringTo3x3(String permutations3x3, int getNum)
    {
       int temp;
       char num;
       String numString;

            num=permutations3x3.charAt(getNum);
            numString= String.valueOf(num);

            temp= Integer.parseInt(numString);

            //System.out.println("****** PRINT VALUE BACK %%%%%: " + temp);

            return temp;


         }


    //Explanations as below...
    public void fill3x3Manual()
    {
       //This is the new set size: 1   1,7,6,3,5,2,4,8,9
       //FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING
       //[1, 7, 6]
       //[3, 5, 2]
       //[4, 8, 9]

       //We know the above is accepted string format for the numbers in the 3x3 grid....
       //I will populate some grids into the set in a similar way...
       //It will be nine  3x3  squares that will get Sudoku
```

```
    //I will also at some point try to experiment with order of these.... to try and get a fully working solution...
    // once I can apply this knowledge here, it will be transferrable to the bigger solution...
    // there is also less clutter here....
    //also I can try and pushing this until it hits  P(9,9)
    // But will need to switch off several system.out.println()!!!!!

    /*
    1 2 3   4 5 6   7 8 9
    4 5 6   7 8 9   1 2 3
    7 8 9   1 2 3   4 5 6

    2 3 1  6 4 5   9 7 8
    5 6 4  9 7 8   3 1 2
    8 9 7  3 1 2   6 4 5

    3 1 2  5 6 4   8 9 7
    6 4 5  8 9 7   2 3 1
    9 7 8  2 3 1   5 6 4
    */


    s.add("1,2,3,4,5,6,7,8,9");
    s.add("4,5,6,7,8,9,1,2,3");
    s.add("7,8,9,1,2,3,4,5,6");
    s.add("2,3,1,5,6,4,8,9,7");
    s.add("6,4,5,9,7,8,3,1,2");
    s.add("9,7,8,3,1,2,6,4,5");
    s.add("3,1,2,6,4,5,9,7,8");
    s.add("5,6,4,8,9,7,2,3,1");
    s.add("8,9,7,2,3,1,5,6,4");


     //get3x3Grid();  can not do this....
    //fill9x9(mp);  // having issue running this.... even tried taking off references to mp...



}



public void fill3x3()
{

  int row=0;
  int col=0;
  int numbersProcessed;   //it will range from 1-81
```

```
    sj = new StringJoiner(",");   //new instance of StringJoiner

    System.out.println("There are : " + permutations + " permutations of arranging  3 x 3 grid" );
    System.out.println("There are : " + Permutations3x3into9x9 + " permutations of arranging  3 x 3 grid into 9 x 9:" + "P(362880,9)" );
    System.out.println("There are : 6,670,903,752,021,072,936,960" + " permutations of completing sudoku");

    System.out.println("This code will attempt to explore but its impossible to expect much");
    System.out.println("It is used for foundation of experimentation but also it has made serious attempt to complete random process to make a grid");
    System.out.println("I am removing excess code so it is ready future development.");

    /*
    //ok so it has completed the full population of a single 3 x 3 grid
    since it has processed   0,0  0,1  0,2
                             1,0  1,1  1,2
                             2,0, 2,1, 2,2
    */


   // KEEP:  this is for set.size().. Set size is determined by end user... It is intended to be set maximum permutaton = 362800
   //It might need to be decreased due to memory limitations..

    do
    {
       //Could have also been done in other iterative ways...
       //tidy code found on internet...
       IntStream stream = Arrays.stream(possibleNumbers); //Stream to take numbers from array
      stream.forEach(str -> lst.add(str));  //placing elements stream into a list...


       numbersProcessed=0;  //ranges from, 0-81

      //value decreases once a number chosen for 3x3 grid...
      //System.out.println("*****This is the list size------: " + lst.size());   //list size


       System.out.println("******These are permutations completed:" + s.size());  //set size


      do    //do while list is not empty
      {
         endFirstRow3x3=false;   // used to mark end of row of 3x3 grid  ([X][2])
```

```
          int randomNumber = rand.nextInt(lst.size());
          //this will get 0-8   rand(9)...  this range is useful for getting random number from the
list

         randomNumber1to9List=lst.get(randomNumber);     //it will get 1-9 based on random
index from list...
         threeBythree[row][col]= randomNumber1to9List;

    // since set has failed to work with List<String>, Int[][], Integer[][], String[][]
    //it has proven to work with String....
    //so all the numbers will be concatenated to a String
    //it might be sensible potentially to complete stringjoiner with ,
    //StringTokenizer can be used to perform retrieval....
    //this number here should be exactly stored in threebythree[row][col]

    sj.add(Integer.toString(randomNumber1to9List));  //added to StringJoiner
    lst.remove(randomNumber);  //this removes random number from the list....

    //System.out.println("This is new list size: " + lst.size());

    if (col%2==0 && col!=0)    // at this point it has populated row of 3 x 3 grid...
    {

       row++;  //it has to start a new row    for threebythree[][]
       col=0;  //the column is reset back to 0
       endFirstRow3x3 = true;  //flag for reaching end of row...
    }

    if (!endFirstRow3x3)   // it will only do this condition if it hasn't already been reset to 0
as part of new column above...
    {
    col++;  //otherwise it will increase the column in the given row by 1 until above
condition is met...

    }

    numbersProcessed++;   //counter of 1-81 increased....
      }while(!lst.isEmpty());   //while list contains a number 1-9......

    currentSize=s.size();
    //System.out.println("This is the current set size: " + currentSize);

    s.add(sj.toString());   // since do while loop has ended, it is now in position to
    //add StringJoiner consiting of for example  1,2,3,4,5,6,7,8,9  into the set...

    newSize=s.size();   //check new set size....
    //System.out.println("This is the new set size: " + newSize + "     Added:   " + sj.toString());

     sj=new StringJoiner(" ");  //the StringJoiner is now used for.....
```

```
      //keeping archive of all numbers numbers going into the board...
      //8(0,0) 7(0,1)   format as follows....


     //this will put the matrix version of 3 x 3 if permutation is unique....
     if (newSize>currentSize)
     {
        mp.put(newSize,threeBythree);  //puts the filled threeBythree into a HashMap...
        //again in my code this is used for limited purpose, it only shows
        //minigrid to end user on screen, since it was easiest way before getting content
available from Set..
     }

     get3x3Grid();  //method call....

     row=0;     // the process starts again
     col=0;  // the process starts again..


     // was contemplating putting a loop inside, but unsure if it right place..
     // it might be useful future when advancing the code...
     //at moment, it is too premature to execute this....

     //}while (!sudokuComplete(failedRows,failedColumns))


     //the top one is default value from permutation class....362,800
     //}while (s.size()<permutations);
     }while (s.size()<permutations);    // this is getting  <(NUMBER)  x   (3x3 boards)


     fill9x9(mp);   //method call
     get9x9Grid();  //method call

/*
*** PSEUDO CODE   ****
numbers can be generated via random. and stored in int[row][col] array   (0-2 for rows and
col)
get current set size
add int[row][col]  into the set
get new set size
continue until below condition....
}while (set.size()<P(9,9);  // can not do this... since these are permutations if sudoku not
met...
// but at same time, it has to explore every single one.....


3 x 3 grids (9 total) filled into   9 x 9 grid    int[this will go from 0-8][value from  0-8]  (need to
think about this!!)
```

[between 0-2, 3-5, 6-8] [between 0-2, 3-5, 6-8]

//This will be the natural partitions of the set entries....
0-2
3-5
6-8

Checking at each time that the rows and columns do not contain duplicate numbers.....

Print out the grid to end user.....

// this showing that it has placed all small 9 grids inside....
} while (!gridFull)
} end for

*/
}

public void fill9x9(Map<Integer, int[][]> mp)
{

/*

// AT THIS POINT I DEVELOPED SOME PSEUDO CODE ON HOW I COULD EXPLORE THE 9x9 GRID
//INTO VARIOUS WAYS... BUT I NEED TO BECOME VERY CONFIDENT WITH MY CODE TO TRY THIS..
//IT WILL ALSO HAVE LIMITATIONS...
****PSEUDO CODE ******

do
{

col=0 col=1 col=2
start any one of the 3x3 grids in position [0,0] of the row=0[3x3] [3x3] [3x3]
row=1[3x3] [3x3] [3x3]
row=2[3x3] [3x3] [3x3]

*remove it from lst (it is removed since it is believed the 3x3 grid can not be replicated)..
and randomnly *pick another 3x3 grid...
*Check if it can go at [0,1]
*if it can, then remove it from lst (since not possible for the grid to go elsewhere).....
*randomnly pick next one from lst.. check if it can go in position [0,2]
*keep going until gridisFull (9x9)
* store the grid...

```
*next time around.. item that was [0,1] can not go back in same place....
start process again until grid is full

}while(permutations<UNKNOWN>    // this means that once it has exceeded set number of
permutations, it will end.
*/

      // this will store all the values.....
      //not used in my code, but I mantained it here since its usefull and tidier than
      //for each loop  or doing a containsKey and then getting desired item....

      Collection<int[][]> col = mp.values();

      // This i10 just a quick lambda validation that there is a key and expected entry for
number keys
      //note the value will not be as expected since its an array....
      //mp.forEach((key, value) -> System.out.println(key + " : " + value));
      //All values print out [[I@e580929   ,  which emphasising issue with using primitive
array
      //or any array in that matter...

      int temp[][]=new int[3][3];
     int successfulInputted3x3=0;



      //Since I am so familiar with working with lists and all the entries in HashMap are
unique and it
      //consists of int[][] which is the most workable for exercise, I will put all the map values
and add it into
      //a list

      //I decided not to use this code, but it offers a simple way to get all map values into
different
      //collection
      List <int[][]> lt = new ArrayList<>(mp.values());
      Set <int[][]> st = new HashSet<>(mp.values());

      int rowCount=0;   //used for small 3x3 grid
      int colCount=0;   //used for small 3x3 grid
      boolean ReachEndColMiniGrid=false;



      int offset=0;
      int i=1;
      int numberOf3x3Processed=0;
      int m;
      int entry3x3=0;
```

```
//int GridCount3x3=1;

//all values in mini grid to be inserted into top left corner...
   // this now functions for first row in 9 x 9
   //need to introduce logic to start for next!!

//**** need to identify where logic will change ***
/*

N N N N N N N N N
N N N N N N N N N
N N N N N N N N N
X 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

The new starting position is no longer [0,0] it is [0,3]  [colIndex, rowIndex]
Unsure what other logic will change with code?
*/

    boolean condition1=false;  // used to ensure mutual exclusive nature of conditions later in code and prevent multiple repetitions
    boolean condition2=false;  // used to ensure mutual exclusive nature of conditions later in code and prevent multiple repetitions
    boolean condition3=false;  // used to ensure mutual exclusive nature of conditions later in code and prevent multiple repetitions



    do
    {

       //System.out.println("I VALUE: " + i);


    //for (int i=0; i<mp.size();i++)     // since the key stored was newsize, and
                            //this started at 1... so mp.get(1) is the first entry...


    //for (int i=0; i<15; i++)  //using 10 mini grids  for now testing


   // ****  FUTURE CODE  ******************
    // taken from internet, there is no other way to acces the set by index
    //so it contains all the strings...

    //note this will get smaller as items removed from set
```

```
        String[] perm3x3 = s.toArray(new String[s.size()]);

            String second3x3StringPlacedInGrid;    //planned to be used advancing my code, not used at moment...


        //Note the board is valid sudoku when the first 3x3 is in it.
        // It's the second one that causes issues....


        second3x3StringPlacedInGrid=perm3x3[1]; //each time second is removed..... since this goes into large grid...

        //if (!sudokuSuccess)
        {
        //s.remove(second3x3StringPlacedInGrid);
        //}

       // **********************


     // This validates to be from the matrix printed to screen.. But not necessarily same order.. Not critical....

            //System.out.println("Expect this to be same as string earlier: " + perm3x3[i]);


        //Not putting in loop to have clear visibility of activity....
        //convertString is taking the String from the set and converting to 3 x 3 grid.
        //each value stored individually....

        temp[0][0]=convertStringTo3x3(perm3x3[entry3x3],0);
        temp[0][1]=convertStringTo3x3(perm3x3[entry3x3],2);
        temp[0][2]=convertStringTo3x3(perm3x3[entry3x3],4);
        temp[1][0]=convertStringTo3x3(perm3x3[entry3x3],6);
        temp[1][1]=convertStringTo3x3(perm3x3[entry3x3],8);
        temp[1][2]=convertStringTo3x3(perm3x3[entry3x3],10);
        temp[2][0]=convertStringTo3x3(perm3x3[entry3x3],12);
        temp[2][1]=convertStringTo3x3(perm3x3[entry3x3],14);
        temp[2][2]=convertStringTo3x3(perm3x3[entry3x3],16);

        //This would be the best time to keep back up of temp[0][0] to ensure same one appears here until all permutations complete...


      //***************FUTURE CODING****************

        int first3x3GridSelected[][] = new int[3][3];
        int rollBackRowIndex;
```

```
    //this is ensuring that if there was sudoku success in first 9x9 grid..
    //It would retain the previously first 3x3 grid in the same position....

    /*
    //QUITE IMPOSSIBLE, TRYING TO DO SITUATON IF SUDOKU FOUND AND RETAINING
FIRST GRID....
    if (sudokuSuccess && entry3x3==0)
    {
       //need to figure out when it would not be the case....
    //logic is when all permutations have happened of all the numbers around it...
    // this would be p(8,8) = 40320
    // So once another 40320 boards have been filled in this scenario...
    //the first 3 x 3 will be available again....
    // and also not allowed in first place again....

      for (int i=0;  i<  40320)
      {
       temp=first3x3GridSelected.clone();
      }
    }
    */


    if (entry3x3==0)
    {
       first3x3GridSelected=temp.clone();
       //Arrays.copyOf(0,0,temp.length);

       //System.out.println("Check for clone: ");


    }

    ////*****************************



    entry3x3++;



       //board is 9x9 so it will end properly....
       if (totalNumbersProcessed<=81)
       {
       //needs to complete these only once at start to initialise these.
       //not each time otherwise it will affect the entire code..
       //this is a total improvised technique never tried before..
       //but the if statements appear to lock the blocks so that it can only occur once
```

```
        //it will go in once since it locks condition2 and condition 3
        //processing [0,0] => [2,8]    27 items

        if (totalNumbersProcessed<=27 && !condition2 && !condition3)
        {

           rollBackRowIndex=rowIndex;    //part of future work.....

           rowIndex=0;
           colIndex=0;
           condition1=true;
           condition2=true;
           condition3=true;

        }

        //once it has has reached number 28, ready start [3,0] => [5,8]  54 items...
        //condition 1 and 3 will be set to false, so it will be locked!

        /*
         N N N N N N N N N
         N N N N N N N N N
         N N N N N N N N N
         N 0 0 0 0 0 0 0 0    Number 28 on this row marked with N
         0 0 0 0 0 0 0 0 0
         0 0 0 0 0 0 0 0 N
         0 0 0 0 0 0 0 0 0
         0 0 0 0 0 0 0 0 0
         0 0 0 0 0 0 0 0 0
        */



        if (totalNumbersProcessed<=54 && totalNumbersProcessed>27 && condition1 &&
condition3)
        {

           rollBackRowIndex=rowIndex;  // Future code

           rowIndex=3;  //[3,0];
           colIndex=0;
           condition2=true;
           condition1=false;
           condition3=false;
        }
```

```
        //checkUniqueColumns()  initially decided to check unique columns here... This
method has quite a flexible point to be called....


        //once it has has reached number 55, ready start [5,0] => [8,8]  81 items....
        //leaving condition3=false and condition2=false will ensure that
        //once totalNumbersProcessed<=27,  it can enter the first if statement.....
        if (totalNumbersProcessed<=81 && totalNumbersProcessed>54 && condition2 &&
!condition1)
        {
           rowIndex=6;  // [6,0]
           colIndex=0;
           condition3=false;
           condition1=true;
           condition2=false;
        }

       //System.out.println("****************************************");

        ReachEndColMiniGrid=false;     // this mignt not be required since value already false
from top.
                                //but it was set again anyhow....



 //SOME OF THE THOUGHT PROCESSES TO UNDERSTAND HOW THE 3x3 GRID FROM SET
FILLS THE BOARD...
// **********************
//At moment, once it finishes the first correctly at (2,2)

/*
1 1 1 X 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 X 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
*/

// The next list item should be stored in  (0,3)  - it should be stored here
// current logic is taking it here... (2,3)  as expected.....
//There is no logic in the coding currently telling it to return back here....

//in first last 3 x 3 grid it finished at  (2,2)
//so clearly the rowIndex (of 9x9) has not reset to 0....
```

```
//once it has processed 9 numbers, the rowIndex always goes back to  0,3, 6
//it will go to 0 if it is processing first 3 list items (0,1,2 zero index based).
//it will go to 3 if it is processing next 3 list items (3,4,5 zero index based).
//it will go to 6 if it is processing next 3 list items (6,7,8 zero index based).

/*
It now resolves the issue and writes content from (0,3) to (0,5) for the 2nd list item....

1 1 1 X 0 ! 0 0 0
! 0 0 ! 0 0 0 0 0
0 0 X 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

after(0,5) it needs to go to (1,3)     - since colIndex 3 is the new starting point...
it is currently going into  (1,0)  - this is similar to it starting the 2nd row  for the 1st list
item...
//logic is somewhere in the code once it has realised that rowCount has reached 2
*/

//As explained above, it has processed adding all 9 numbers from the set onto bigger grid
//

//Could use a switch here, but for

//0 0 0 0 0 0 0 0 0    RowIndex = 0
//0 0 0 0 0 0 0 0 0    RowIndex = 1
//0 0 0 0 0 0 0 0 0    RowIndex = 2
//0 0 0 0 0 0 0 0 0    RowIndex = 3
//0 0 0 0 0 0 0 0 0    RowIndex = 4
//0 0 0 0 0 0 0 0 0    RowIndex = 5
//0 0 0 0 0 0 0 0 0    RowIndex = 6
//0 0 0 0 0 0 0 0 0    RowIndex = 7
//0 0 0 0 0 0 0 0 0   RowIndex =  8



// is is taken to be which grid
//it will be later phased out since it is a very generic variable...

if (numberOf3x3Processed==9)    // if it has completed all numbers in the 3 x 3 grid....
{

switch(i)
   {
      case 1:
```

```
          rowIndex=0;
          break;
        case 2:
          rowIndex=0;
          break;
        case 3:
          rowIndex=0;
          break;
        case 4:
          rowIndex=3;
          break;
        case 5:
          rowIndex=3;
          break;
        case 6:
          rowIndex=3;
          break;
        case 7:
          rowIndex=6;
          break;
        case 8:
          rowIndex=6;
          break;
        case 9:
          rowIndex=6;
          break;
    }
}


numberOf3x3Processed=0;

          for (int n=0; n<temp.length;n++ )    //temp is array [2][2]
          {

             if (colCount>=2 && rowCount!=2)  // if it reaches last number of  first row
             {

                rowCount++;   // it starts new row of temp[][]
                colCount=0;   // it starts again at column 0


                //would also have to start new row on big grid..
                rowIndex++;

                //it would only start colIndex if  offset is also equal to 0
                //this would be the case for 1st 3x3 grid.... in each row.....

                if (offset==0)
```

```
            {
               colIndex=0;
            }
            else
            {
               colIndex=offset;
            }

            //IT HAS REACHED THE LAST COLUMN BIG GRID..  COLINDEX8..
            //IN THIS CASE, IT HAS TO reset back to start new rowIndex
            //IT SHOULD HIT THIS POINT WHEN numbersprocessed has hit 9...
            //otherwise it has not finished inputting the last 3x3 grid into
            //9x9

            //it has to also start again on big grid
            //but this time it moves down 3 places (rowIndex) from [0,0]  to [3,0]
            //no to overwrite any data....

            if (colIndex==8 && numberOf3x3Processed==9)
            {
               colIndex=0;
               rowIndex=rowIndex+3;
               ReachEndColMiniGrid=true;  //sets flag

            }

            //if it hasn't reached the last column on 9x9
            //and it has processed entire 3 x 3 mini grid...
            //The next grid is adjacent by exactly 1 place (colIndex)
            //

            if (colIndex!=8 && numberOf3x3Processed==9)
            {
               colIndex=colIndex+1;
               rowIndex=0;  //it starts again on top row of 9x9
            }

         }

         //it is uniform array, so can use temp[0] or temp.length

         for (int k=0; k<temp[0].length;k++)  // this will then go through each column in
row....
                     //or each row if temp.length is used....
         {
            numberOf3x3Processed++;


            //this has to keep track of the colIndex (9 by 9 grid)
```

```
            //It is stored in offset..
            //otherwise when it starts the next row, it will lose position

            // The offset needs to be considered at commence of each column on temp[][]
            if (k==0)
            {
               offset=colIndex;   //offset becomes the current colIndex on the 9x9 grid....

            }

            //*** UNSURE WHERE THIS COMMENT RESIDED.. BUT ITS SORT ISSUES I HAD TO WRITE DOWN ******
                  //PERHAPS THERE ARE EASIER WAYS TO POPULATE THE GRID... BUT I THINK I HAVE AT LEAST GIVEN IT LOTS
            //FLEXIBILITY POINTS FOR MANIPULATION OF ADDING VALUE....
            //colindex is wrong for the second list item....
            //in first row, its fine since it is set to +1 pos from last grid.
            //when the row has increased, the column has gone to 0, need to change this logic...


                  //This is expected based on values inputted under no constraints....


            //System.out.println("\nCurrent sudoku board: " + numComplete9x9Boards + " out of " + (int) (s.size()/9) );
                        //System.out.println("Selecting grid (3x3) " + i +" from : "+ s.size());
            //System.out.println("Total numbers processed so far: " + totalNumbersProcessed + " out of 81");
            //System.out.println("Current offset in 9x9 grid: " + offset);
            //System.out.println("Starting in this col in 9 x 9: " + colIndex);
            //System.out.println("The current coordinate(3x3):  " + "(" +rowCount +","+ colCount +")");
            //System.out.println("Following number chosen: " + temp[rowCount][colCount]);
            //System.out.println("being stored at coordinate(9x9): " + "(" + rowIndex + "," + colIndex +")");



            //System.out.println("currently processing this from 3 x 3:" + "(" + rowCount + "," +colCount+")");


                  //Follwing added into StringJoiner
            //In this format  8(0,0) 7(0,1)
                  sj.add(temp[rowCount][colCount] + "("+rowIndex+","+colIndex+")");
```

```
                    //CRITICAL CODE, WITH ALL OFFSETS ABOVE, THIS FINALLY STORES  3x3 GRID INTO 9x9
                // FROM LEFT TO RIGHT, ROW BY ROW
                  nineByNine[rowIndex][colIndex]=temp[rowCount][colCount];



                  //** FUTURE CODE ****
                  //BUT THIS TECHNIQUE FOR PERMUTATION WILL BE TOO EXHAUSTIVE...
                  //this can potentially be done after the first 3x3 grid is filled in each row..
                  //since one expects the row to be unique at this point...
                  //but no harm anyhow doing it now...
                  //unfortunately due to nature of code, it has to check after a single number is added on the board...
                  //massive overhead...

                  //ensure copy of the existing set.......
                  //select 1st 3x3 grid..
                  //Populate it into 9x9 grid.....
                  //remove it from the Set with permutations....


                // FURTHER PSEUDO CODE FOR ADVANCED PART OF TRYING TO GET ALL PERMUTATIONS.....
                // ******** PSEUDO CODE ***********

                  //need to work out what to do if its no good the grid...
                  // it needs to prevent this minigrid to be selected again in this position (if it violated with first grid), until the numComplete9x9Boards has incremented.

                 /*
                  if its ok... (this can only be finalised right when numberOf3x3Processed =9)
                  remove this 3x3 from the  set....

                  When numComplete9x9Boards increases, restore copied set back as original.
                  The board that was in column offset 0  [0,0] of 9x9 has to stay there
                  until it has exhausted all permutations of 3x3 grids around it...

                 */
                // ************************************

                      realTime9x9Fill(sj.toString());    //method call, this also checks for uniquerows and uniquecols...



                  colCount++;  //moves forwad position on 3 x 3
```

```
            colIndex++;  //moves forward position on the main 9 x 9

            if (numberOf3x3Processed==9)   //if it has done all values in 3x3
            {
               colCount=0;   //starts again in 3x3
               rowCount=0; //starts again in 3x3
            }

            if (totalNumbersProcessed!=0 && totalNumbersProcessed%9==0)
               {
                  //this is indication that it has finished a 3 x 3 grid....
                  //it has to be done before the incrementing of totalNumbersProcessed

System.out.println("row: " + failedRows);
                  System.out.println("col: " + failedColumns);
               System.out.println("Numbers processed in 3x3 grid:" + numberOf3x3Processed);
                  if (numberOf3x3Processed==9)
                  {
                     if (!failedRows&& !failedColumns)
                     {
                        System.out.println("ever here");
                        successfulInputted3x3++;
                     }
                     else
                     {
                        successfulInputted3x3=0;
                     }
                  }

                  System.out.println("Streak of successful 3x3 blocks: " +
successfulInputted3x3);




                  i++;    // goes from 1-9.....

               }

               //indication that it has filled 9 x 9
                if (totalNumbersProcessed%81==0)
               {

                              //adds ninebynine board into map... Again, this is not used in
coding... But was initially thought that having
                  //aspect of containsKey, it might trigger a technique to try different 9x9
boards....
                  completedBoards.put(numComplete9x9Boards,nineByNine);
```

```
                    print9x9Board(sj.toString(), numComplete9x9Boards);  //method call..



                System.out.println("\nCurrent sudoku board: " + numComplete9x9Boards + "
out of " + (int) (s.size()/9) );
                 numComplete9x9Boards++;




                totalNumbersProcessed=0;  // starting again..... from 0-81

                        i=1; // reset again...

                sj = new StringJoiner(" ");  //new StringJoiner to wipe contents....


                   //thie will evaluate to true if there are failedRows and failedColumns....
                   if (sudokuComplete(failedRows, failedColumns))
                   {


                      //this brings original set back....
                      // It is unlikely if actually reducing set size on selection of 3x3 grids...
will increase chance of getting a 9x9 board...
                      //for the moment it is re-instated anyhow....
                      s = new HashSet(copyPermuations);

                      //This variable is for my advanced pseudo, not pursued...
                      sudokuSuccess=true;
                   }

                   else
                   {



                   }

                //This was inline with trying to creating new classes of nbn...
                //But not sure benefit at moment..
                //it might be useful if techniques are sought to manipulate the 9x9 board
further and keep logic separate from implenting interface....

                //nbn[nineByNineBoardNumber] = new nineByNine();
```

```
                }

              totalNumbersProcessed++;


            } //end for loop  to go through  columns in each row

                } //end for loop for each row


            //System.out.println("************************************");
          }


       }

    }while((numComplete9x9Boards*9)<=s.size()); //end for loop iterate through Set
       //it will end sensibly since numComplete9x9Boards has incremented already.
       // so if the set has 20 (3x3) and it has processed 2 x numComplete9x9Boards
       //3 x 9 = 27....   which exceeds 20.....
    }

   // this prints the board on the screen..
    public void print9x9Board(String currentStringJoinerFullGrid, int numComplete9x9Boards)
    {


      //String currentCompleted9x9Board=completedBoardsLogs[count];     //keeps track of
current 9x9 board....

      //it stores value in array on Strings...
      completedBoardsLogs[count]=currentStringJoinerFullGrid;
      //7(0,0) 2(0,1) 8(0,2) 5(1,0) 3(1,1) 4(1,2) 1(2,0) 9(2,1) 6(2,2) 7(0,3) 5(0,4) 8(0,5) 6(1,3)
2(1,4) 3(1,5) 9(2,3) 4(2,4) 1(2,5) 1(0,6) 3(0,7) 5(0,8) 9(1,6) 4(1,7) 6(1,8) 8(2,6)
      //7(2,7) 2(2,8)

    //System.out.println("\nThis is your board number " + (numComplete9x9Boards) + "
summary: " + completedBoardsLogs[count]);
        count=count+1;

      }

      public void realTime9x9Fill(String history)
      {
         int row=0;
         int col=0;
         int boardValue=0;
         int startLastNumber;
```

```
          int rowtoInt=0;
          int coltoInt=0;
          int boardValuetoInt=0;


       //System.out.println(history);
    //data in history similar to as below.....
    //7(0,0) 2(0,1) 8(0,2) 5(1,0) 3(1,1) 4(1,2) 1(2,0) 9(2,1) 6(2,2) 7(0,3) 5(0,4) 8(0,5) 6(1,3)
2(1,4) 3(1,5) 9(2,3) 4(2,4) 1(2,5) 1(0,6) 3(0,7) 5(0,8) 9(1,6) 4(1,7) 6(1,8) 8(2,6) 7(2,7) 2(2,8)


         // this means there is only one value in board since no space introduced by
StringJoiner yet...
        if (history.lastIndexOf(" ")==-1)
        {
            row = Character.getNumericValue(history.charAt(2));
            col = Character.getNumericValue(history.charAt(4));
            boardValue= Character.getNumericValue(history.charAt(0));


           formattedBoard [row][col]=boardValue;

        }

         else
         {
            //if history is //7(0,0) 2(0,1) 8(0,2), lastIndex space is before 8

            //all values are chars...
            startLastNumber=history.lastIndexOf(" ");
            row = history.charAt((startLastNumber+3));
            col = history.charAt((startLastNumber+5));
            boardValue = history.charAt((startLastNumber+1));

            //converting all values to integer...
            rowtoInt = Character.getNumericValue(row);
            coltoInt = Character.getNumericValue(col);
            boardValuetoInt= Character.getNumericValue(boardValue);

            //storing into board....
            formattedBoard [rowtoInt][coltoInt]=boardValuetoInt;

         }

         //System.out.println("FILLING BOARD");
         display9x9();

         //implemented, started straight away after 1 number in 9x9
         //if overheads are too high, it can be potentially moved till after entire row is done....
```

```
        //since for each number added into 9x9, it has to check for occurences of all possibleNumbers
        checkUniqueRows(formattedBoard, rowIndex);
        checkUniqueColumns(formattedBoard, colIndex);

    }

    public void display9x9()
    {

      for (int i=0; i<formattedBoard.length; i++)   //for each row
      {

         sj1= new StringJoiner(" ");  // StringJoiner erased before start of processing each row only


         for (int j=0; j<formattedBoard[0].length; j++)  // for each column in row above....
         {
            sj1.add(Integer.toString(formattedBoard[i][j]));  //since this prints all 81 values here


         }

         //System.out.println(sj1);
       }

    }


  public boolean checkUniqueRows(int[][] nineByNine, int rowIndex)
  {

    int occurenceNumberRow=0;  // it will be cleared each time method is called.
    //even if location of checkUniqueRows is moved after the board is populated, it will still function...
    //again all this is possible to conserve memory and let program execute more cycles...

    for (int j=0; j<possibleNumbers.length; j++)
    {
       occurenceNumberRow=0;

      for (int i=0; i<nineByNine[0].length; i++)    //checking column across row
      {

         //here rowIndex will take reference from 9 x 9 grid value...
         //it will keep rowIndex same, but move across each column
```

```
            if (possibleNumbers[j]==nineByNine[rowIndex][i])  // this would check
possibleNumbers[j]
            //against all numbers in the grid...

            {
               occurenceNumberRow++;    //increase count of occurrence.

               //default for failedRows is false.. so it doesn't need to be initialised like this..
               //if more once instance of numbr and failedRows=false... (which would be
expected)
               if (occurenceNumberRow>1 && !failedRows)
               {
               failedRows = true;  //there are now failedRows...

               //This was inline advancing my code.
               //For instance if a grid is partially filled with a 3x3 and it does not meet criteria
               //for sudoku, then depending on the number inserted, it might need to move
back to offset,
               //rowIndex and colIndex

               //RollBackRow()  //future coding.....

               }
            }

         }
         //The output of number(1-9) and frequency has to be here before it moves on to
check next from possibleNumbers
         //System.out.println("Number: " + possibleNumbers[j] + " has occured: " +
occurenceNumberRow +  " times in  row" + rowIndex);

      }//end of main for loop going through all numbers.....


      return failedRows;   //returns flag value...
   }


   public boolean checkUniqueColumns(int[][] nineByNine, int colIndex)
   {
       //this will simply do a compare of the grid in current state against all possible numbers

      int occurenceNumberCol=0;


      for (int j=0; j<possibleNumbers.length; j++)
      {
         occurenceNumberCol=0;
```

```
        for (int i=0; i<nineByNine.length; i++)    //checking each row.. this is to allow it to navigate across colIndex
        {
           if (possibleNumbers[j]==nineByNine[i][colIndex])  //here rowIndex will take reference from 9 x 9 grid value..  it wil move down each row but keep col the same....
           {
              occurenceNumberCol++;

              if (occurenceNumberCol>1 && !failedColumns)
              {
              failedColumns = true;
              }

           }

        }
        //System.out.println("Number: " + possibleNumbers[j] + " has occured: " + occurenceNumberCol +  " times in column " + colIndex);
     }


      //Just need to be careful that default value of failedColumns array will be false...
     // if it set to false on initialisation,  if it finds a false column, it will remain false...
     // Only route to become true is if there are no failed columns at all.
     //Logic has been carried out..

     return failedColumns;

  }

  //duplicateNumbersRow takes values failedRows
  //duplicateNumbersCol takes values failedColumns

  //The board number has been included, since now for maximum execution cycles, all
  //System.out.println() can be turned off except for the below.....
   public boolean sudokuComplete(boolean duplicateNumbersRow, boolean duplicateNumbersCol)
  {


     //if either flags are true.....  the grid has failed....
     if (duplicateNumbersRow || duplicateNumbersCol)   //if both are true, it means that sudoku has failed...
           {
              //System.out.println("**************************");
              System.out.println("Better luck next time, failed on board: " + count);

              wipe9x9Board(formattedBoard,nineByNine);
```

```
                //System.out.println("**************************");

                //System.out.println("\n\nMoving onto Board Number: " +
numComplete9x9Boards);

                failedRows=false;
                failedRows=false;

                return false;

            }
            //otherwise success
            else
            {
                //System.out.println("**************************");
                System.out.println("\nCongratulations, sudoku complete on board: " + count);
                //System.out.println("**************************");

                //two boards are wiped and ready start again....
                wipe9x9Board(formattedBoard,nineByNine);


                //System.out.println("Moving onto Board Number: " +
numComplete9x9Boards);



                return true;
            }






    }

    public void get9x9Grid()
    {

    }

    //Removing all testing....
     public void get3x3Grid()
    {

        //this will get out all the 3x3 grids from the permutations.....
        int k=0;
        if (mp.containsKey(newSize))
        {
```

```
        miniGrid = mp.get(newSize);
        k++;
      }
           //System.out.println("FULLY FUNCTIONAL PRINTING THE ARRAY TO STRING");
      for (int[] g :miniGrid)
      {

        //System.out.println(Arrays.toString(g));
      }


}
}


public class Permutation
{
public static void main(String[] args) {
System.out.println("Welcome to Online IDE!! Happy Coding :)");
int originalNumber=9;
int n=originalNumber;
int r =9;
Map <Integer, Long> m = new HashMap<>();
System.out.println("***PERMUTATIONS***");
System.out.println("P(n,r) = n! / (n−r)!");
System.out.println("P(" + n+","+r+") = " + n+"!" + " / " + "("+n+"-"+r+")!");


String
Permutations3x3into9x9="108,883,584,818,776,183,656,945,007,213,012,309,135,068,193
,536,000";
String sudokuSolutions = "6,670,903,752,021,072,936,960";

Sudoku sud = new Sudoku (Permutations (n,r,originalNumber, m),Permutations3x3into9x9);


//I attempted this to try and get the value of  P(362800, 9) to try and get value on the
screen...
//But it was going to produce stack overflow or similar as expected.....
//Since we known  from  P(81,9) =  362800, this will be the new n.....

//(Permutations ((Permutations (n,r,originalNumber, m),Permutations3x3into9x9)
,r,originalNumber, m),Permutations3x3into9x9);


//System.out.println(Permutations (n,r,originalNumber, m));
}
public static long Permutations (int n, int r, int originalNumber, Map factorialResults)
{
```

```
// n are objects
// r is sample
/*
***CALCULATION***
P(n,r) = n! / (n−r)!
*/
long result=0;
int temp;
int denominator;
if (originalNumber<r || r<0)
{
System.out.println("please enter n ≥ r ≥ 0");
System.exit(0);
return 0;
}
if (n>=1)
{
// EXAMPLE
// P (5,6) = 5* 4 * 3 * 2 * 1 / (6-5)! = 24 / 2! = 24 / 2 * 1 = 24/2 = 12
result = (n* (Permutations (n-1, r,originalNumber, factorialResults))); // this completes
factorial for numerator
factorialResults.put(n,result); //result stored in the Map
//System.out.println("getting result back out numerator " + n+": " + factorialResults.get(n));
if (n==originalNumber) // this will occur once
{
denominator = originalNumber-r; // originalNumber required since n has reduced as part of
the recursive calls
//System.out.println("This is denominator: " + denominator);
// this is using the Java Memoization technique to ensure the factorial outcome is not
calculated again, to save program execution cycles.
// since the returns are done in reverse order.... n = 1 is processed first and n=6 last...
//Hence in practice there will be entry in Map for all factorials, ready for the denominator..
if (factorialResults.containsKey(denominator))
{
//System.out.println("here");
//System.out.println("This is exact value of factorial denominator " + (denominator) + " : " +
factorialResults.get(denominator));
return result / (long)factorialResults.get(denominator); // this is number permutations
}
}
return result; // this will be returning already calculating numerator part
}
return 1; // // it should reach here if this is false: (n>=1) }
}
}
```

*** OUTPUT WITH SET SIZE REDUCED TO 20 (WITH TO DEMONSTRATE FULL CODE EXECUTION **** COMMENTS STILL OFF

Note: Permutation.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.
Welcome to Online IDE!! Happy Coding :)
PERMUTATIONS
P(n,r) = n! / (n−r)!
P(9,9) = 9! / (9-9)!
There are : 362880 permutations of arranging 3 x 3 grid
There are : 108,883,584,818,776,183,656,945,007,213,012,309,135,068,193,536,000 permutations of arranging 3 x 3 grid into 9 x 9:P(362880,9)
There are : 6,670,903,752,021,072,936,960 permutations of completing sudoku
This code will attempt to explore but its impossible to expect much
It is used for foundation of experimentation but also it has made serious attempt to complete random process to make a grid
I am removing excess code so it is ready future development.
******These are permutations completed:0
******These are permutations completed:1
******These are permutations completed:2
******These are permutations completed:3
******These are permutations completed:4
******These are permutations completed:5
******These are permutations completed:6
******These are permutations completed:7
******These are permutations completed:8
******These are permutations completed:9
******These are permutations completed:10
******These are permutations completed:11
******These are permutations completed:12
******These are permutations completed:13
******These are permutations completed:14
******These are permutations completed:15
******These are permutations completed:16
******These are permutations completed:17
******These are permutations completed:18
******These are permutations completed:19

Current sudoku board: 1 out of 2
Better luck next time, failed on board: 1

Current sudoku board: 2 out of 2
Better luck next time, failed on board: 2

** Process exited - Return Code: 0 **

ALSO WITH RESPECT TO MY FURTHER ADVANCEMENT OF CODE:

If I left the first 3x3 grid at position 1 and removed it from 362,880

This is the permutation of arranging 3x3 grids in remaining 8 vacant spots..
P(362 779, 8)

Result

Permutations, $_nP_r = \frac{362779!}{(362779 - 8)!}$

=
299,987,801,173,779,981,802,385,163,222,794,880,759,350,400

It has to be realised biggest long in Java is:
9,223,372,036,854,775,807

It is realized even if two grids completely satisfied suduko, the third selection would be:

Result

Permutations, $_nP_r = \frac{362778!}{(362778 - 7)!}$

=
826,916,114,697,322,562,227,651,444,054,906,377,600

This is still too large to process.

if 6 of 3x3 grids satisfy suduko rules, then only can the formula be used and remain within range of Java…

Result

Permutations, $_nP_r = \frac{362774!}{(362774 - 3)!}$

= 47,742,468,414,021,144

So perhaps, in the executions that are taking place for the number of boards, it is sensible to introduce a variable that counts if it hits a streak of adjacent boards populating from left to right, row by row… If this figure hits 6, I can store this portion of the grid

I introduced this new code every time it finished processing 3x3 grid. By this time, it had already gone through process of checking unique rows and columns and these flags would be set to true..

```
if (totalNumbersProcessed!=0 && totalNumbersProcessed%9==0)
                {
                   //this is indication that it has finished a 3 x 3 grid....
                   //it has to be done before the incrementing of totalNumbersProcessed
```

****EXTRA CODE****

```
System.out.println("row: " + failedRows);
                   System.out.println("col: " + failedColumns);
                   System.out.println(numberOf3x3Processed);
if (numberOf3x3Processed==9)
                   {
                      if (!failedRows&& !failedColumns)
                      {
                         successfulInputted3x3++;
                      }
                      else
                      {
                         successfulInputted3x3=0;
                      }
                   }

                   System.out.println("Streak of successful 3x3 blocks: " +
successfulInputted3x3);
```

**** OUTPUT SIMILAR EACH TIME **********

As expected, no issues first grid….

```
4 2 8 0 0 0 0 0 0
5 3 9 0 0 0 0 0 0
1 7 6 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
```

0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
row: false
col: false
Streak of successful 3x3 blocks: 1

It seems to hit duplication number in row every single time I execute code and get no streak.. The column remains false as expected…

4 2 8 7 8 2 0 0 0
5 3 9 9 4 1 0 0 0
1 7 6 6 3 5 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
row: true
col: false
9
Streak of successful 3x3 blocks: 0

This means I clearly need to devise a new strategy, I found it quite odd that it could not even reach three grids in a row without duplicating in a row…..

I will upload my finished codes... in a text file:
(1 x with all relevant system.out.println)
(1 x heavily reduced system.out.println to enable more cycles)….

I will not continue to progress this any further…