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

## TEST SCENARIO 1

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

        diceRoll d  = new diceRoll(1,3);
```

```
Number dice rolls: 10000 for    1 dice
Total: 3

Die 1: 3

Total number possibilites: 1
```

## TEST SCENARIO 2

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

        diceRoll d  = new diceRoll(2,5);

    }
```

```
Number dice rolls: 10000 for    2 dice
Total: 5

Die 1: 3,  Die 2: 2

Die 1: 4,  Die 2: 1

Die 1: 2,  Die 2: 3

Die 1: 1,  Die 2: 4

Total number possibilites: 4
```

# TEST SCENARIO 3

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

        diceRoll d  = new diceRoll(3,4);

    }
```

```
Number dice rolls: 10000 for    3 dice
Total: 4

Die 1: 2,  Die 2: 1,  Die 3: 1

Die 1: 1,  Die 2: 1,  Die 3: 2

Die 1: 1,  Die 2: 2,  Die 3: 1

Total number possibilites: 3
```

# TEST SCENARIO 4

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

        diceRoll d  = new diceRoll(4,18);

    }
```

```
Number dice rolls: 10000 for    4 dice
Total: 18

Die 1: 6,  Die 2: 2,  Die 3: 5,  Die 4: 5

Die 1: 6,  Die 2: 5,  Die 3: 4,  Die 4: 3
```

```
Die 1: 6,  Die 2: 3,  Die 3: 5,  Die 4: 4

Die 1: 6,  Die 2: 4,  Die 3: 6,  Die 4: 2

Total number possibilites: 80
```

# TEST SCENARIO 5

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

        diceRoll d  = new diceRoll(6,20);

    }
```

## Expected 4221

```
Welcome to Online IDE!! Happy Coding :)

Number dice rolls: 10000 for    6 dice
Total: 20
```

THIS IS TOO LOW FOR EXPECTED RESULTS

```
Die 1: 6,  Die 2: 3,  Die 3: 1,  Die 4: 4,  Die 5: 2,  Die 6: 4

Total number possibilites: 813
```

## Number dice rolls increased to 50,000

```
Number dice rolls: 50000 for    6 dice
Total: 20
```

```
Die 1: 1,  Die 2: 3,  Die 3: 3,  Die 4: 1,  Die 5: 6,  Die 6: 6

Total number possibilites: 2738
```

```
Die 1: 1,  Die 2: 3,  Die 3: 3,  Die 4: 1,  Die 5: 6,  Die 6: 6

Total number possibilites: 2738
```

Value still short of 4,221

Number dice rolled increased to 250,000

```
Number dice rolls: 250000 for    6 dice
Total: 20
```

```
Die 1: 1,  Die 2: 3,  Die 3: 3,  Die 4: 1,  Die 5: 6,  Die 6: 6

Total number possibilites: 4200
```

Still short 4,221

PERHAPS IT WAS SENSIBLE TO USE FACTORIAL, HOWEVER ANOTHER ATTEMPT IS TAKEN INCREASING THE ROLLS TO 750,000

```
Number dice rolls: 750000 for    6 dice
Total: 20
```

```
Die 1: 1,  Die 2: 3,  Die 3: 3,  Die 4: 1,  Die 5: 6,  Die 6: 6

Total number possibilites: 4221
```

It has reached 4,221

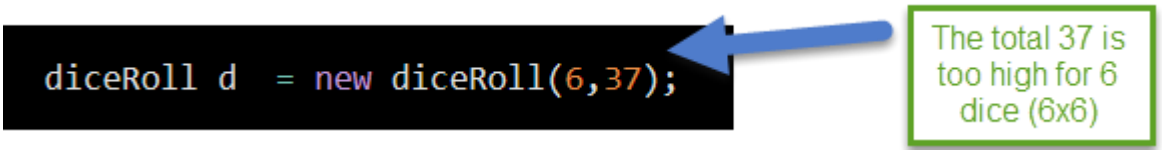
TEST SCENARIO 6 (FURTHER VALIDATIONS)

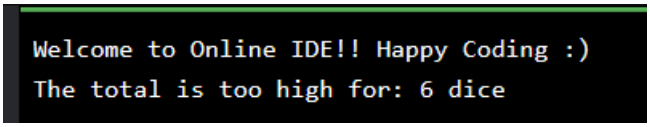
```
diceRoll d  = new diceRoll(6,2);
```

TOTAL IS LESS THAN NUMBER DICE

```
Welcome to Online IDE!! Happy Coding :)
Increase total or reduce number dice
```

# TEST SCENARIO 7 (FURTHER VALIDATIONS)




# *** CODE **

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

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

import java.util.*;
import java.math.*;
import java.lang.reflect.Array;

//only one action is taken on the dice
interface Rollable
{
   public int roll();
}


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

      //first parameter is numberDice
      //second parameter is the total
      diceRoll d  = new diceRoll(6,37);

   }
}
class diceRoll implements Rollable
{
   Set <String> s  = new HashSet<>();   // this will store values obtained on the die / dice
   //Map<Integer, String> m = new HashMap<>();
```

```
   private int numberDice;
   private int total;
   private int totalRolled;

   public int roll()
   {

      int[] diceValue = new int[numberDice];

      int count;

      Random rnd = new Random();

      int numberDiceRolls=750000;   //number dice rolls. Please note even 750,0000 might be
insufficient if
                              //several dice included.. So best to increase this value to verify

      System.out.println("\nNumber dice rolls: " + numberDiceRolls + " for    " + numberDice +
" dice");
      System.out.println("Total: " + total);

      for (int i=0;i<numberDiceRolls;i++)

      {
         StringJoiner sj = new StringJoiner(",  ");  // this will be used to seperate the outcome of
the die
         totalRolled=0;
         //System.out.println("\ni is: " + i);

         for (int j=0;j<numberDice;j++)  //each die processed
         {
            diceValue[j]=(rnd.nextInt(6)+1);   //random number generated between 1 and 6
            totalRolled=totalRolled+diceValue[j];  // the value is stored of their total
            //since only interested in the rolls where total was met

            sj.add("Die " + (j+1)+": " + Integer.toString(diceValue[j]));

            //System.out.println("dice roll: " + diceValue[j]);

         }

         if (totalRolled==total)
         {
            //System.out.println("This is total rolled:" + totalRolled);
            //m.put(i,sj.toString());
            s.add(sj.toString());    // the stringjoiner will be added to the set if total is as
expected
         }


      }
```

```
      count=0;

      //System.out.println("\n");

      //for (Map.Entry<Integer, String> e : m.entrySet())


      for (String m: s)    // this processes each string in the set
      {
         // Printing key-value pairs
         System.out.println("\n"+ m);
         //System.out.println(e.getKey() + " "
          //              + e.getValue() + "\n");

                        count++;    //mantains count of rolls
      }

   System.out.println("\nTotal number possibilites: " + count);

   return count;

   }

   public diceRoll(int numberDice, int total)
   {
      this.numberDice=numberDice;
      this.total=total;

      if (total<numberDice)   //extra validation
      {
         System.out.println("Increase total or reduce number dice");
         System.exit(0);
      }

      if (total>(6*numberDice))   //extra validation
      {
         System.out.println("The total is too high for: " + numberDice + " dice");
         System.exit(0);
      }

      roll();

   }

}
```