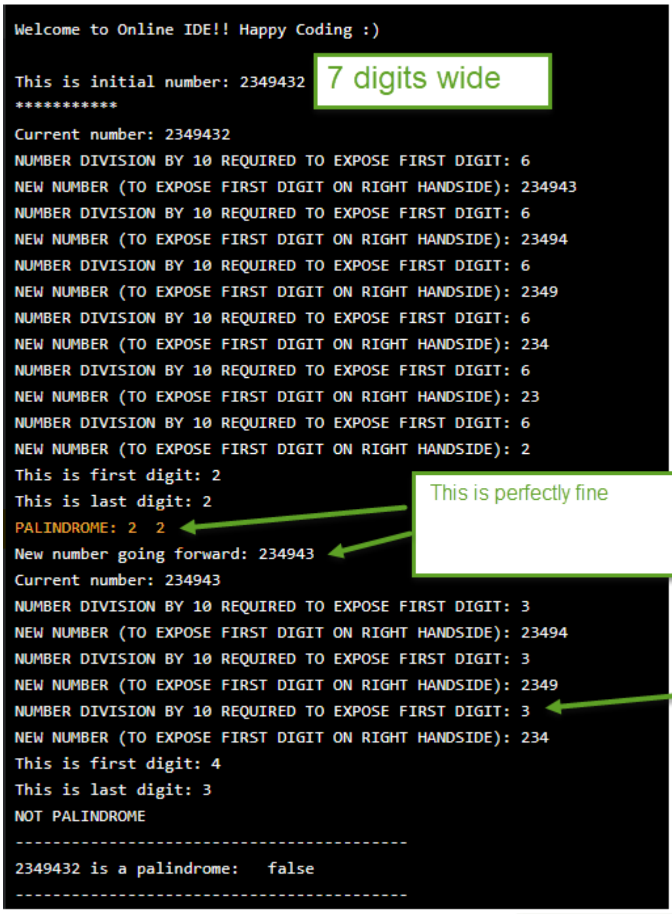
EXAMINING NEWLY IDENTIFIED FAILED TEST CASES

TEST CASE: number =   2349432;   //7 digits wide FAIL



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

This is initial number: 2349432
***********
Current number: 2349432
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 6
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 234943
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 6
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 23494
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 6
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 2349
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 6
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 234
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 6
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 23
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 6
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 2
This is first digit: 2
This is last digit: 2
PALINDROME: 2  2
New number going forward: 234943
Current number: 234943
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 3
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 23494
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 3
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 2349
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 3
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 234
This is first digit: 4
This is last digit: 3
NOT PALINDROME
------------------------------------------
2349432 is a palindrome:    false
------------------------------------------
```

7 digits wide

This is perfectly fine

It has performed a halving effect similar to if the initial integer was 5 digit wide

But we can see that it infact required four

2 3 4 9 4 3

We can see that even when operating with 9 digits wide number initially. The first movement is 8 digits wide.... And when one number is dropped off the right hand side, the next movement at **4 is invalid**

2 3 4 9 4 3 1 8

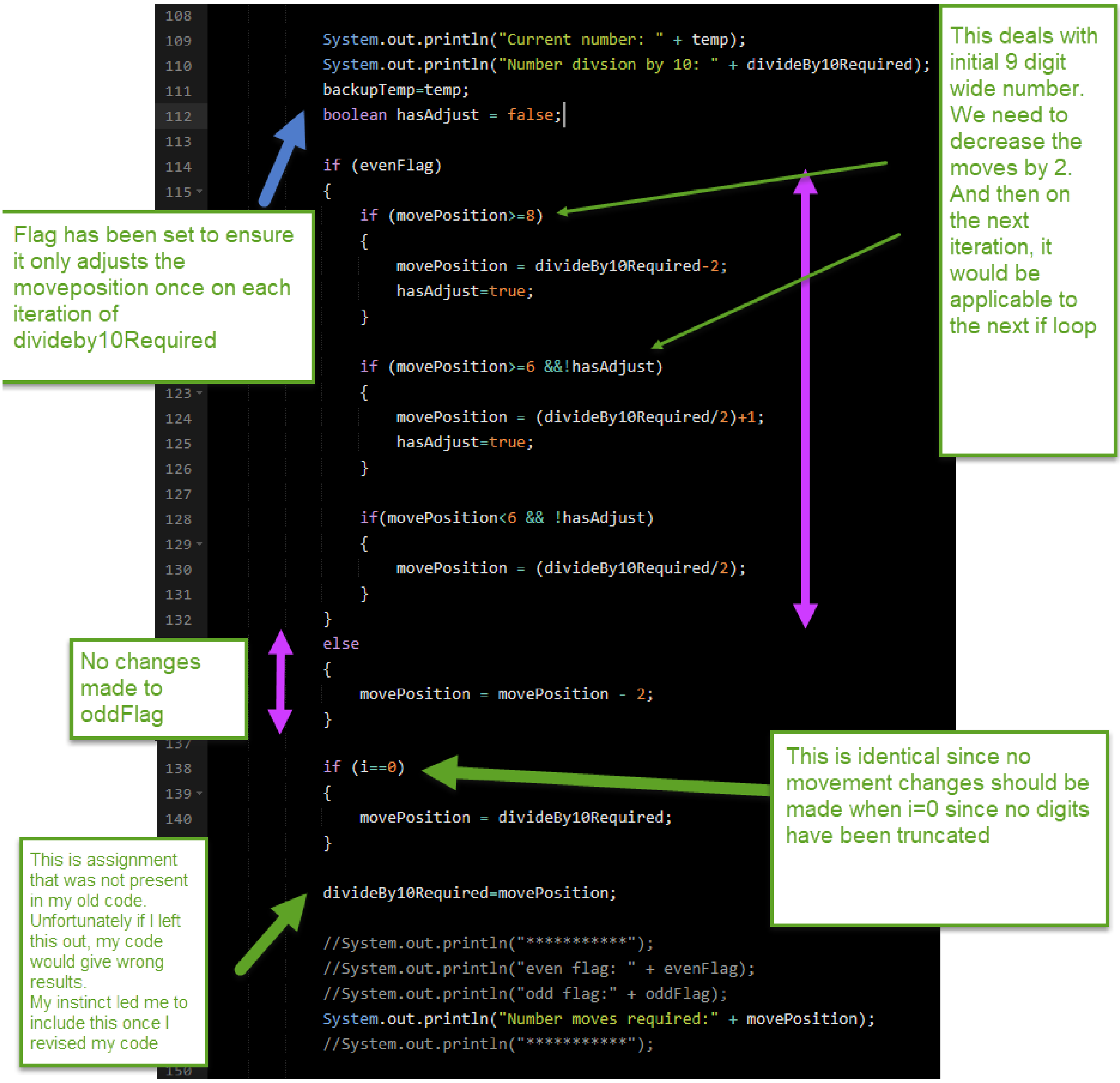
2 3 4 9 4 3 1 8 2

THIS IS 6 DIGIT MOVEMENT, AND LOGIC DIFFERS TO ABOVE

I have modified my code as follows to handle this scenario.

NOTE: I am not exploring from the perspective of long data type, however I suspect the similar principles will unfold.

But it would require testing just in case



```
        System.out.println("Current number: " + temp);
        System.out.println("Number divsion by 10: " + divideBy10Required);
        backupTemp=temp;
        boolean hasAdjust = false;

        if (evenFlag)
        {
            if (movePosition>=8)
            {
                movePosition = divideBy10Required-2;
                hasAdjust=true;
            }

            if (movePosition>=6 &&!hasAdjust)
            {
                movePosition = (divideBy10Required/2)+1;
                hasAdjust=true;
            }

            if(movePosition<6 && !hasAdjust)
            {
                movePosition = (divideBy10Required/2);
            }
        }
        else
        {
            movePosition = movePosition - 2;
        }

        if (i==0)
        {
            movePosition = divideBy10Required;
        }

        divideBy10Required=movePosition;

        //System.out.println("***********");
        //System.out.println("even flag: " + evenFlag);
        //System.out.println("odd flag:" + oddFlag);
        System.out.println("Number moves required:" + movePosition);
        //System.out.println("***********");
```

Flag has been set to ensure it only adjusts the moveposition once on each iteration of divideby10Required

This deals with initial 9 digit wide number. We need to decrease the moves by 2. And then on the next iteration, it would be applicable to the next if loop

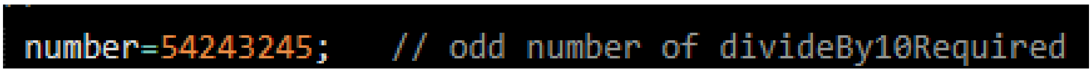
No changes made to oddFlag

This is identical since no movement changes should be made when i=0 since no digits have been truncated

This is assignment that was not present in my old code. Unfortunately if I left this out, my code would give wrong results. My instinct led me to include this once I revised my code

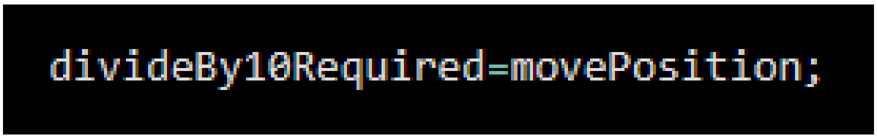
I will run through all my test cases again

TEST CASE 1: FAIL



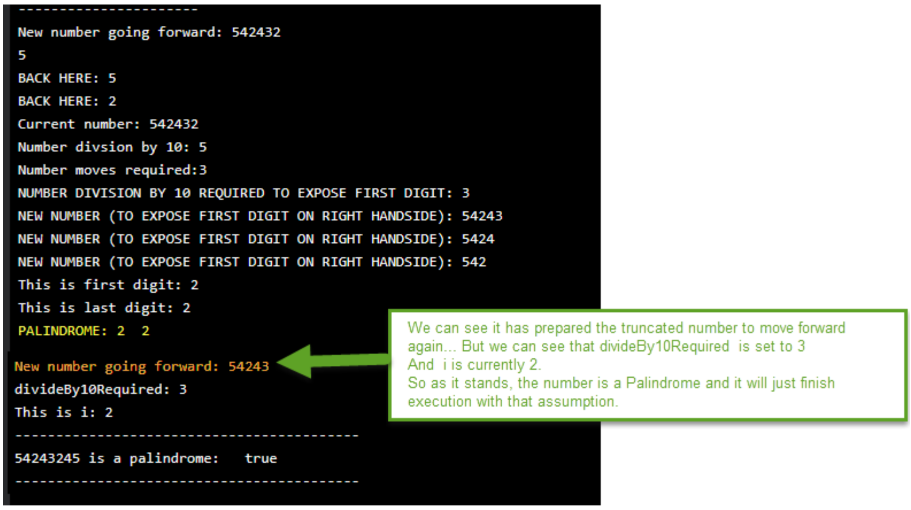
```
number=54243245;    // odd number of divideBy10Required
```

I can only account for this fail inline with the following implementation above.



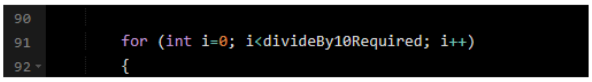
```
divideBy10Required=movePosition;
```

And I discovered that since the for loop was based on the variable divideby10Required, I had also impacted iterations the for loop had completed.



```
---------------------
New number going forward: 542432
5
BACK HERE: 5
BACK HERE: 2
Current number: 542432
Number divsion by 10: 5
Number moves required:3
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 3
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 54243
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 5424
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 542
This is first digit: 2
This is last digit: 2
PALINDROME: 2  2

New number going forward: 54243
divideBy10Required: 3
This is i: 2
-----------------------------------------
54243245 is a palindrome:   true
-----------------------------------------
```

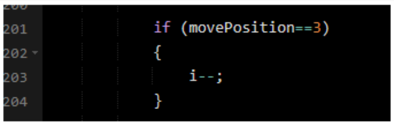
We can see it has prepared the truncated number to move forward again... But we can see that divideBy10Required is set to 3
And i is currently 2.
So as it stands, the number is a Palindrome and it will just finish execution with that assumption.



```
        for (int i=0; i<divideBy10Required; i++)
        {
```

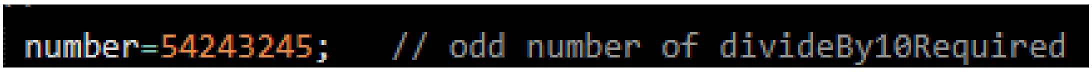
In practice there should not be any further circumstances similar..
We know from the number going forward it will be comparing and performing a final check... with movePosition=1.   So I will just decrement the i variable as follows:

4 3

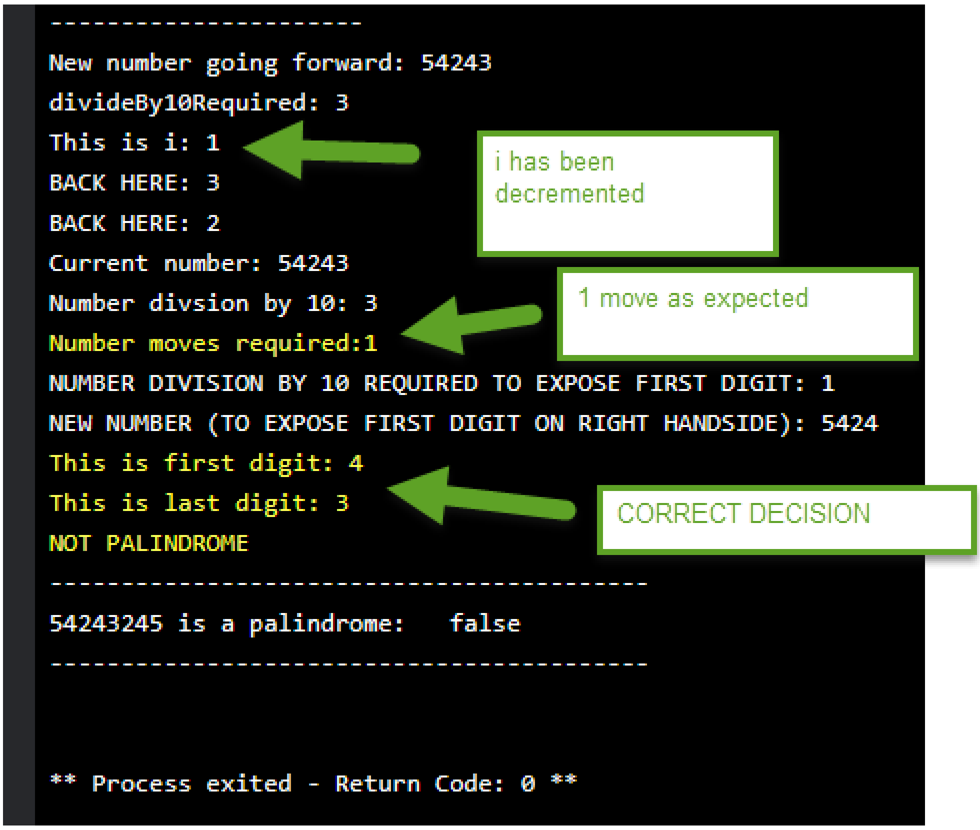


```
                if (movePosition==3)
                {
                    i--;
                }
```

TEST CASE 1a: PASS



```
number=54243245;    // odd number of divideBy10Required
```



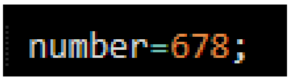
```
----------------------
New number going forward: 54243
divideBy10Required: 3
This is i: 1
BACK HERE: 3
BACK HERE: 2
Current number: 54243
Number divsion by 10: 3
Number moves required:1
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 1
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 5424
This is first digit: 4
This is last digit: 3
NOT PALINDROME
------------------------------------------
54243245 is a palindrome:    false
------------------------------------------



** Process exited - Return Code: 0 **
```

i has been decremented

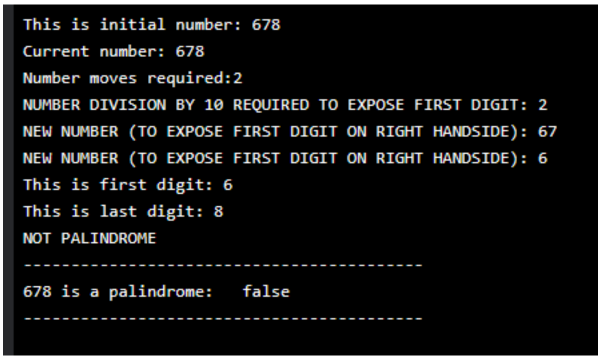
1 move as expected

CORRECT DECISION

TEST CASE 2: PASS

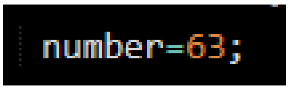


```
number=678;
```

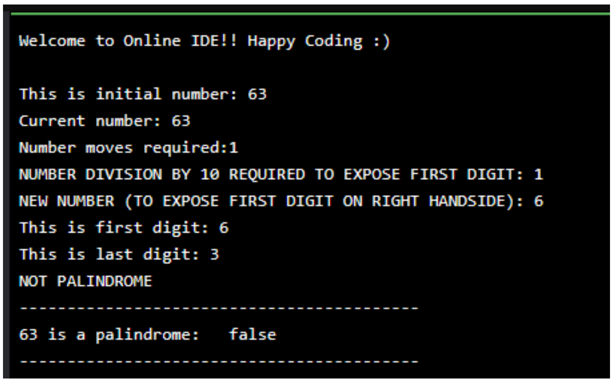


```
This is initial number: 678
Current number: 678
Number moves required:2
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 2
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 67
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 6
This is first digit: 6
This is last digit: 8
NOT PALINDROME
------------------------------------------
678 is a palindrome:    false
------------------------------------------
```

TEST CASE 3: PASS

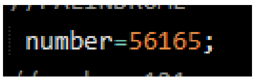


```
number=63;
```

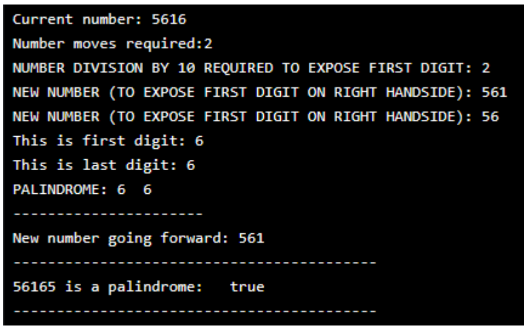


```
Welcome to Online IDE!! Happy Coding :)

This is initial number: 63
Current number: 63
Number moves required:1
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 1
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 6
This is first digit: 6
This is last digit: 3
NOT PALINDROME
------------------------------------------
63 is a palindrome:   false
------------------------------------------
```

TEST CASE 4: PASS

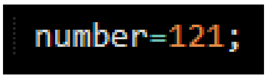


```
number=56165;
```

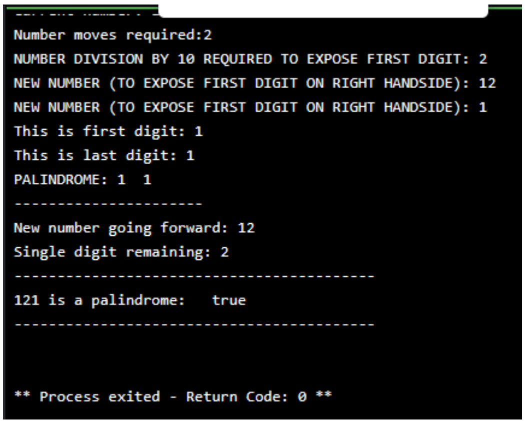


```
Current number: 5616
Number moves required:2
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 2
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 561
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 56
This is first digit: 6
This is last digit: 6
PALINDROME: 6  6
--------------------
New number going forward: 561
------------------------------------------
56165 is a palindrome:   true
------------------------------------------
```

TEST CASE 5: PASS

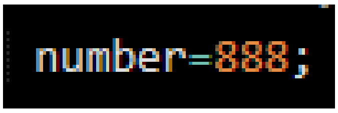


```
number=121;
```

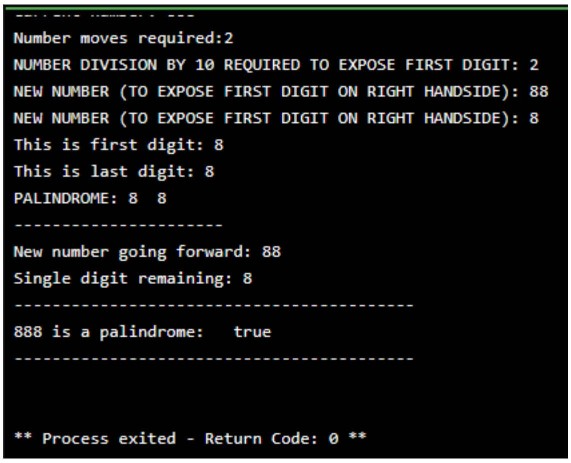


```
Number moves required:2
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 2
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 12
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 1
This is first digit: 1
This is last digit: 1
PALINDROME: 1  1
--------------------
New number going forward: 12
Single digit remaining: 2
------------------------------------------
121 is a palindrome:   true
------------------------------------------


** Process exited - Return Code: 0 **
```

TEST CASE 6: PASS

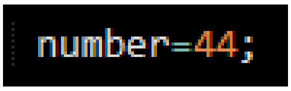


```
number=888;
```

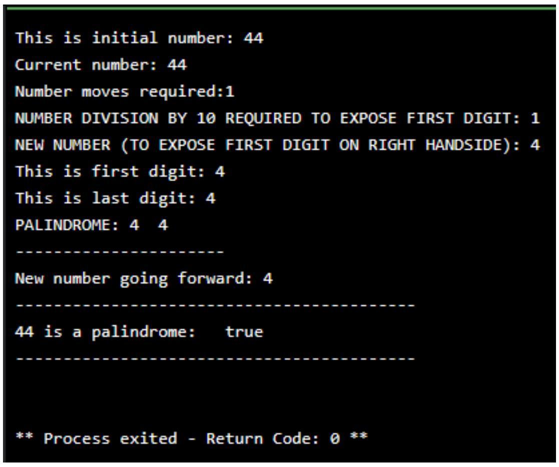


```
Number moves required:2
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 2
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 88
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 8
This is first digit: 8
This is last digit: 8
PALINDROME: 8  8
---------------------
New number going forward: 88
Single digit remaining: 8
------------------------------------------
888 is a palindrome:   true
------------------------------------------


** Process exited - Return Code: 0 **
```

TEST CASE 7: PASS

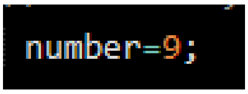


```
number=44;
```

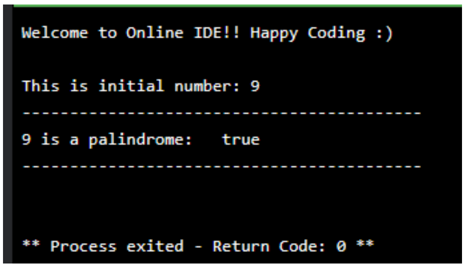


```
This is initial number: 44
Current number: 44
Number moves required:1
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 1
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 4
This is first digit: 4
This is last digit: 4
PALINDROME: 4  4
---------------------
New number going forward: 4
------------------------------------------
44 is a palindrome:   true
------------------------------------------


** Process exited - Return Code: 0 **
```

TEST CASE 8: PASS

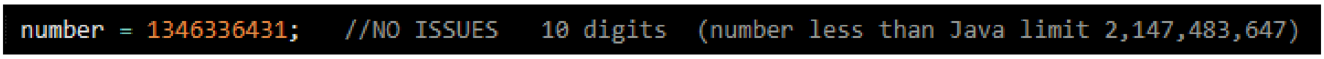


```
number=9;
```



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

This is initial number: 9
------------------------------------------
9 is a palindrome:   true
------------------------------------------


** Process exited - Return Code: 0 **
```

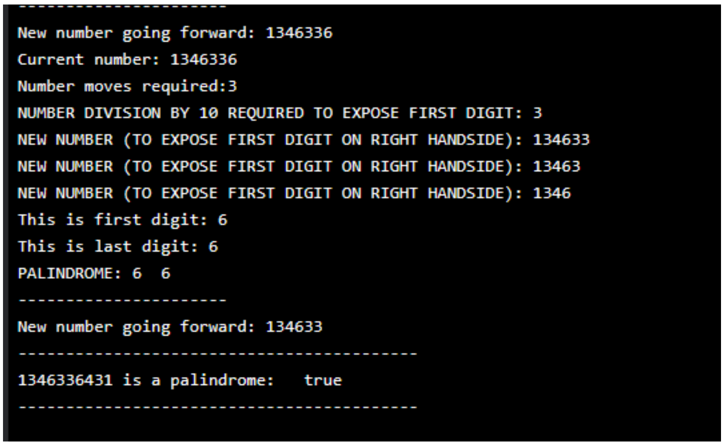
TEST CASE 9: PASS



```
number = 1346336431;    //NO ISSUES    10 digits   (number less than Java limit 2,147,483,647)
```

However I could see that it has performed 6 with 6 and not compared 3 with 3 and made a decision.

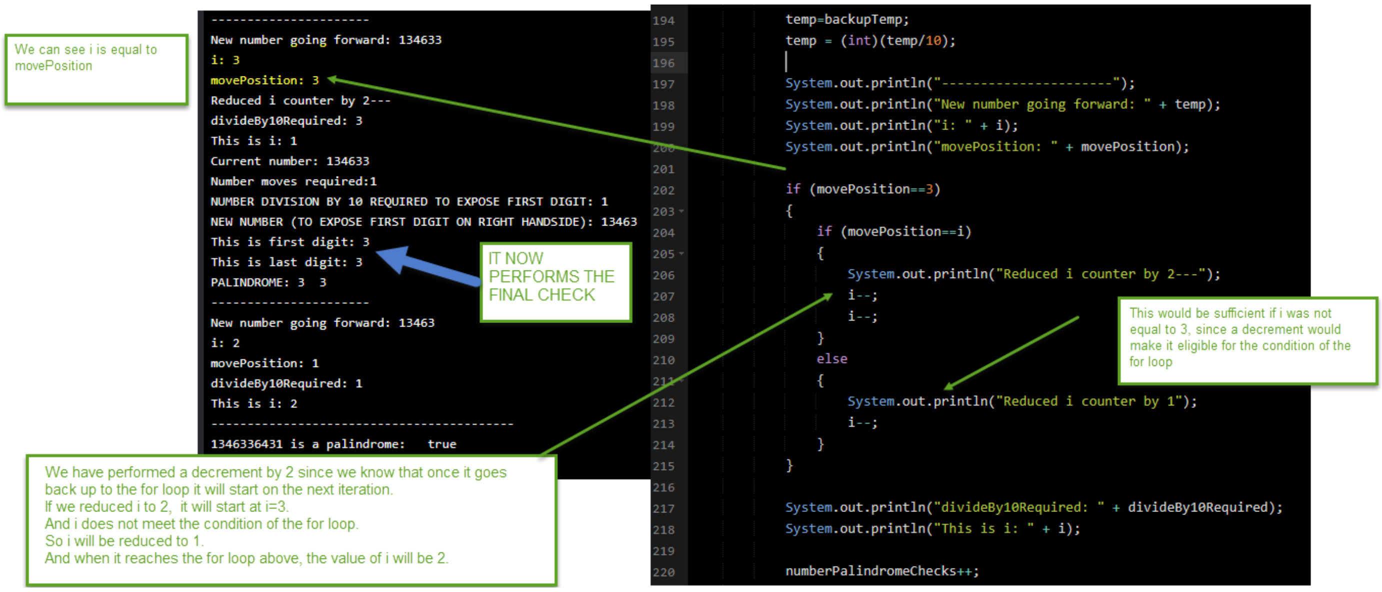
Once again, this suggests that that variable i has caught up with limit on the for loop.



```
---------------------
New number going forward: 1346336
Current number: 1346336
Number moves required:3
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 3
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 134633
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 13463
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 1346
This is first digit: 6
This is last digit: 6
PALINDROME: 6  6
---------------------
New number going forward: 134633
-----------------------------------------
1346336431 is a palindrome:   true
-----------------------------------------
```

Rather than setting i back to 0, which is feasible.. It is not performing modification in a rationale way.

Instead I have examined the value of variable (i) in comparison to movePosition and performed correct adjustments..



We can see i is equal to movePosition

```
---------------------
New number going forward: 134633
i: 3
movePosition: 3
Reduced i counter by 2---
divideBy10Required: 3
This is i: 1
Current number: 134633
Number moves required:1
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 1
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 13463
This is first digit: 3
This is last digit: 3
PALINDROME: 3  3
---------------------
New number going forward: 13463
i: 2
movePosition: 1
divideBy10Required: 1
This is i: 2
-----------------------------------------
1346336431 is a palindrome:   true
```

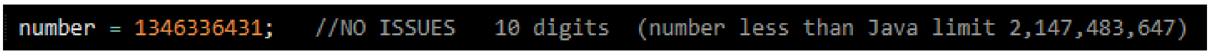
IT NOW PERFORMS THE FINAL CHECK

```java
temp=backupTemp;
temp = (int)(temp/10);

System.out.println("---------------------");
System.out.println("New number going forward: " + temp);
System.out.println("i: " + i);
System.out.println("movePosition: " + movePosition);

if (movePosition==3)
{
    if (movePosition==i)
    {
        System.out.println("Reduced i counter by 2---");
        i--;
        i--;
    }
    else
    {
        System.out.println("Reduced i counter by 1");
        i--;
    }
}

System.out.println("divideBy10Required: " + divideBy10Required);
System.out.println("This is i: " + i);

numberPalindromeChecks++;
```

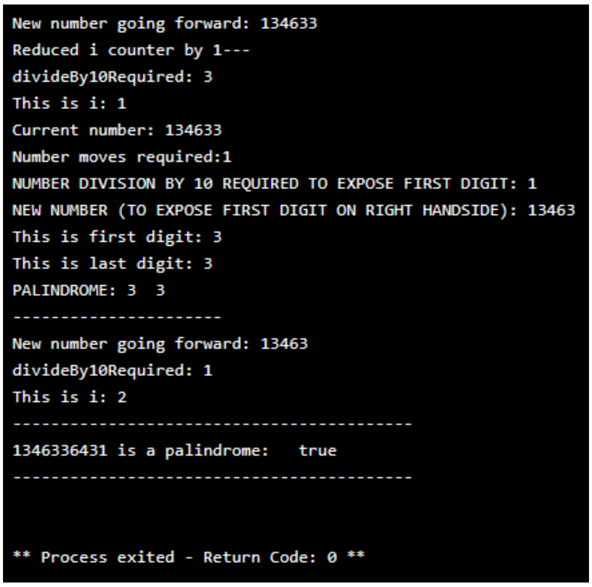
This would be sufficient if i was not equal to 3, since a decrement would make it eligible for the condition of the for loop

We have performed a decrement by 2 since we know that once it goes back up to the for loop it will start on the next iteration.
If we reduced i to 2, it will start at i=3.
And i does not meet the condition of the for loop.
So i will be reduced to 1.
And when it reaches the for loop above, the value of i will be 2.

TEST CASE 9a: PASS

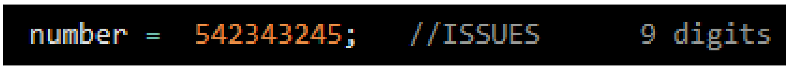


```
number = 1346336431;    //NO ISSUES   10 digits  (number less than Java limit 2,147,483,647)
```

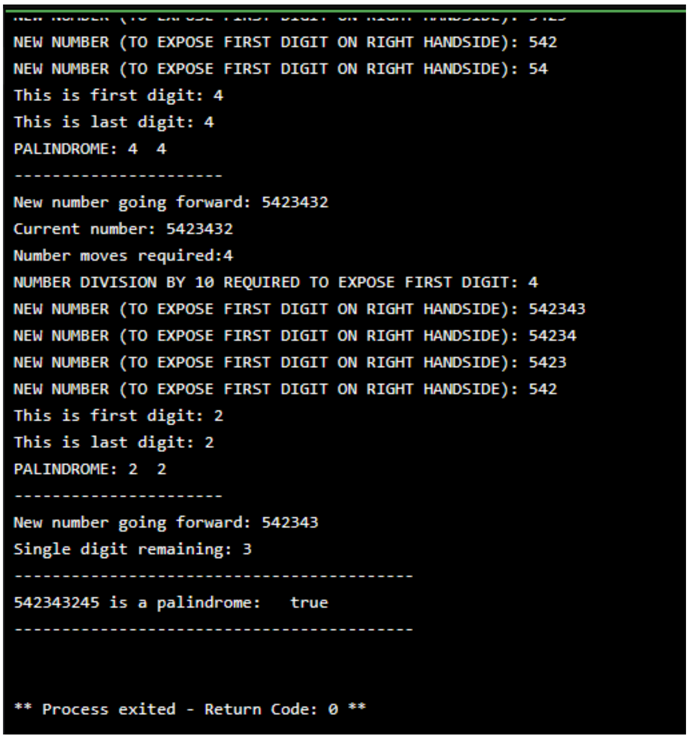


```
New number going forward: 134633
Reduced i counter by 1---
divideBy10Required: 3
This is i: 1
Current number: 134633
Number moves required:1
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 1
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 13463
This is first digit: 3
This is last digit: 3
PALINDROME: 3  3
----------------------
New number going forward: 13463
divideBy10Required: 1
This is i: 2
-------------------------------------------
1346336431 is a palindrome:   true
-------------------------------------------


** Process exited - Return Code: 0 **
```

TEST CASE 10: PASS

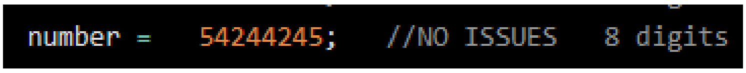


```
number =  542343245;   //ISSUES      9 digits
```

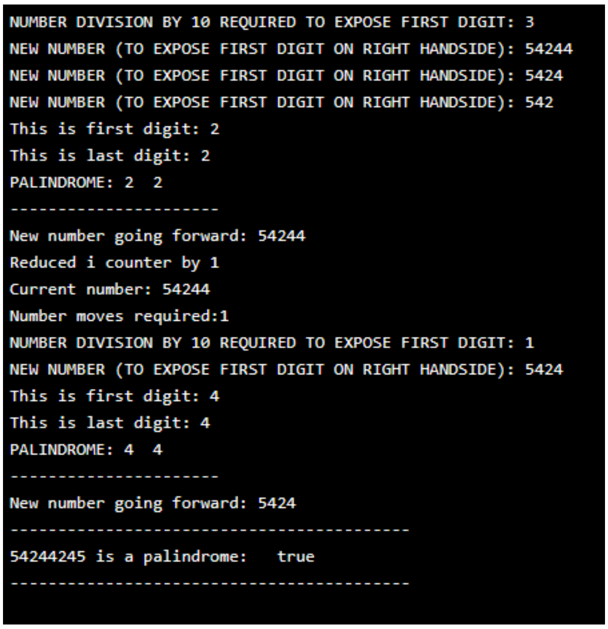


```
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 5423
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 542
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 54
This is first digit: 4
This is last digit: 4
PALINDROME: 4  4
----------------------
New number going forward: 5423432
Current number: 5423432
Number moves required:4
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 4
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 542343
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 54234
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 5423
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 542
This is first digit: 2
This is last digit: 2
PALINDROME: 2  2
----------------------
New number going forward: 542343
Single digit remaining: 3
-------------------------------------------
542343245 is a palindrome:   true
-------------------------------------------


** Process exited - Return Code: 0 **
```

TEST CASE 11: PASS

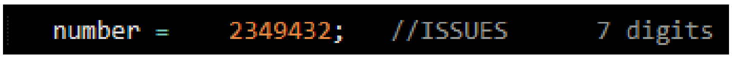


```
number =    54244245;   //NO ISSUES   8 digits
```

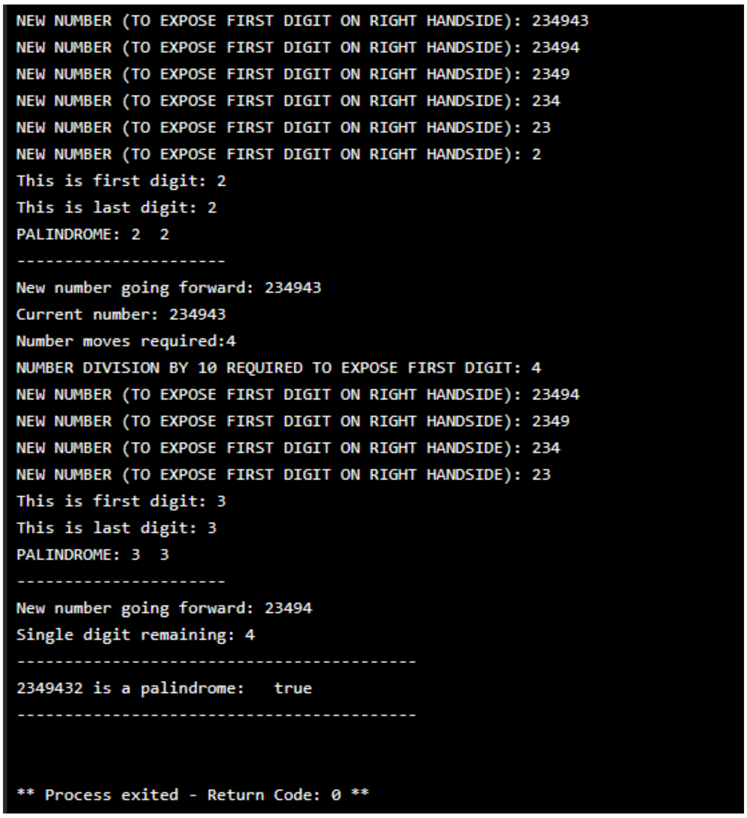


```
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 3
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 54244
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 5424
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 542
This is first digit: 2
This is last digit: 2
PALINDROME: 2  2
---------------------
New number going forward: 54244
Reduced i counter by 1
Current number: 54244
Number moves required:1
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 1
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 5424
This is first digit: 4
This is last digit: 4
PALINDROME: 4  4
---------------------
New number going forward: 5424
-----------------------------------------
54244245 is a palindrome:   true
-----------------------------------------
```

TEST CASE 12: PASS

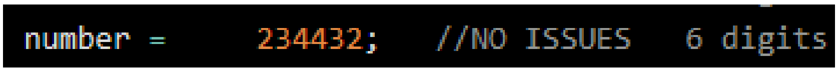


```
number =     2349432;    //ISSUES        7 digits
```

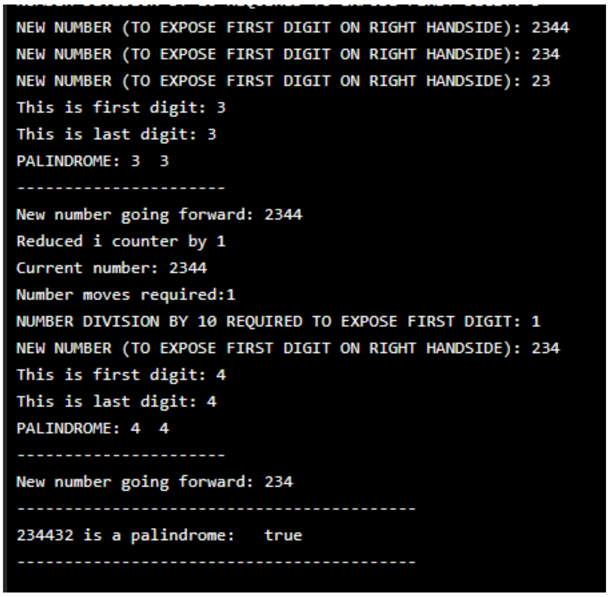


```
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 234943
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 23494
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 2349
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 234
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 23
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 2
This is first digit: 2
This is last digit: 2
PALINDROME: 2  2
---------------------
New number going forward: 234943
Current number: 234943
Number moves required:4
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 4
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 23494
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 2349
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 234
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 23
This is first digit: 3
This is last digit: 3
PALINDROME: 3  3
---------------------
New number going forward: 23494
Single digit remaining: 4
-----------------------------------------
2349432 is a palindrome:   true
-----------------------------------------


** Process exited - Return Code: 0 **
```

TEST CASE 13: PASS

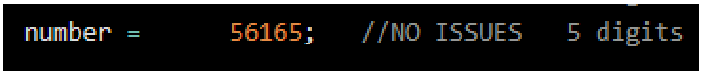


```
number =      234432;   //NO ISSUES    6 digits
```

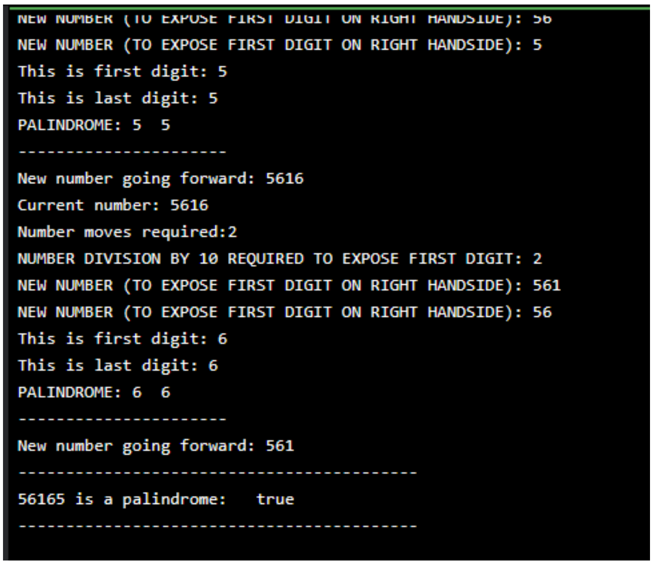


```
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 2344
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 234
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 23
This is first digit: 3
This is last digit: 3
PALINDROME: 3  3
----------------------
New number going forward: 2344
Reduced i counter by 1
Current number: 2344
Number moves required:1
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 1
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 234
This is first digit: 4
This is last digit: 4
PALINDROME: 4  4
----------------------
New number going forward: 234
------------------------------------------
234432 is a palindrome:   true
------------------------------------------
```

TEST CASE 14: PASS



```
number =      56165;   //NO ISSUES    5 digits
```



```
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 56
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 5
This is first digit: 5
This is last digit: 5
PALINDROME: 5  5
----------------------
New number going forward: 5616
Current number: 5616
Number moves required:2
NUMBER DIVISION BY 10 REQUIRED TO EXPOSE FIRST DIGIT: 2
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 561
NEW NUMBER (TO EXPOSE FIRST DIGIT ON RIGHT HANDSIDE): 56
This is first digit: 6
This is last digit: 6
PALINDROME: 6  6
----------------------
New number going forward: 561
------------------------------------------
56165 is a palindrome:   true
------------------------------------------
```