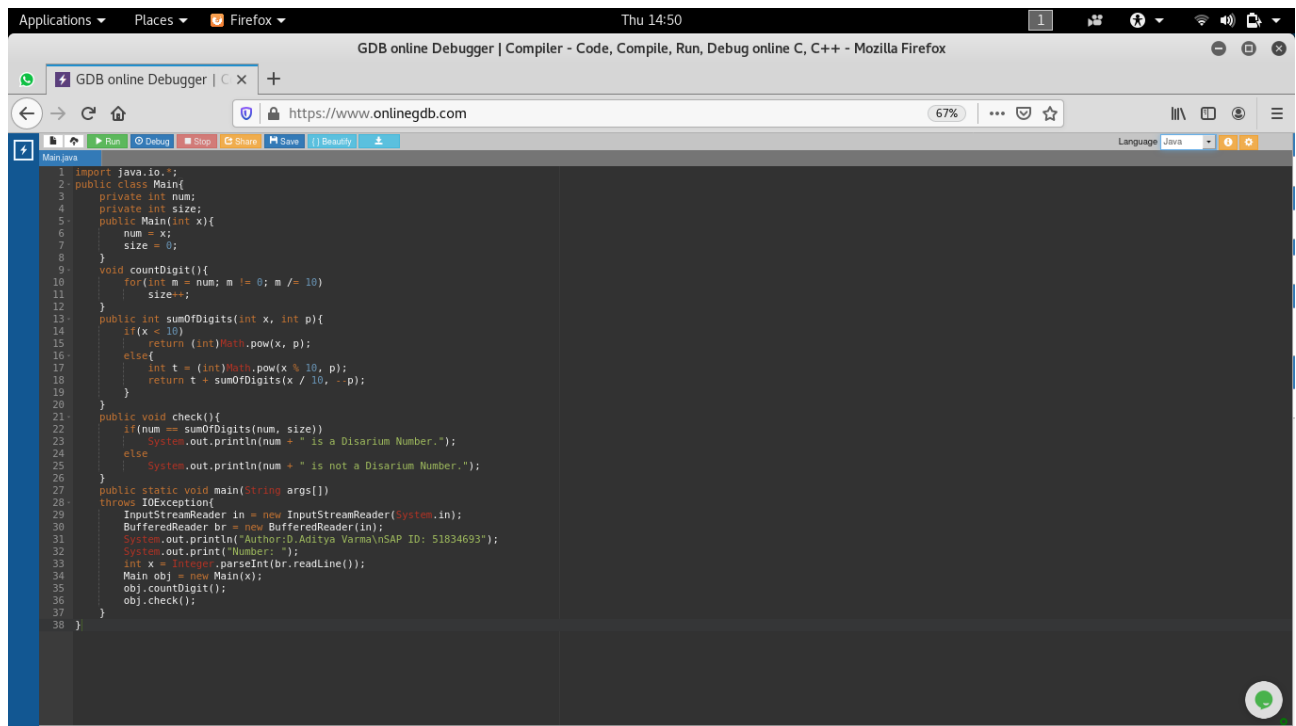


1)

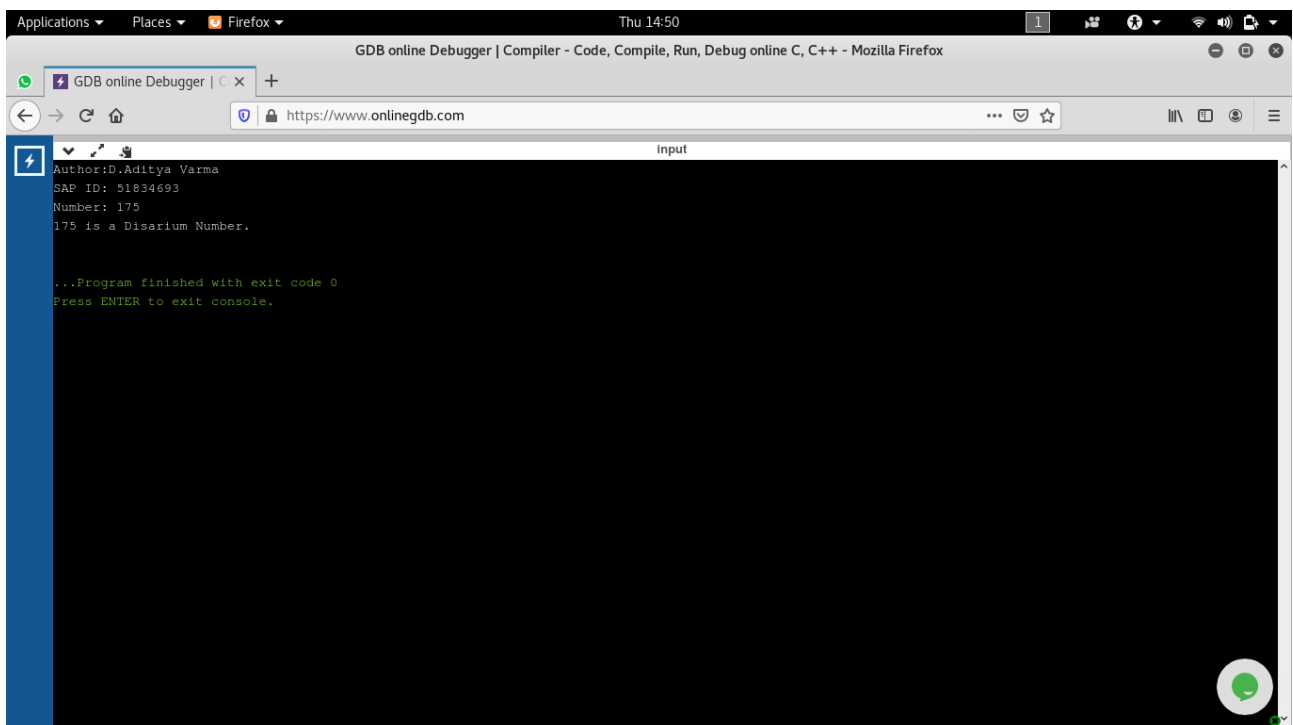
```
import java.io.*;
public class Main{
    private int num;
    private int size;
    public Main(int x){
        num = x;
        size = 0;
    }
    void countDigit(){
        for(int m = num; m != 0; m /= 10)
            size++;
    }
    public int sumOfDigits(int x, int p){
        if(x < 10)
            return (int)Math.pow(x, p);
        else{
            int t = (int)Math.pow(x % 10, p);
            return t + sumOfDigits(x / 10, --p);
        }
    }
    public void check(){
        if(num == sumOfDigits(num, size))
            System.out.println(num + " is a Disarium Number.");
        else
            System.out.println(num + " is not a Disarium Number.");
    }
    public static void main(String args[])
    throws IOException{
        InputStreamReader in = new InputStreamReader(System.in);
        BufferedReader br = new BufferedReader(in);
        System.out.println("Author:D.Aditya Varma\nSAP ID: 51834693");
        System.out.print("Number: ");
        int x = Integer.parseInt(br.readLine());
        Main obj = new Main(x);
        obj.countDigit();
        obj.check();
    }
}
```

input:



```
1 import java.io.*;
2 public class Main{
3     private int num;
4     private int size;
5     public Main(int x){
6         num = x;
7         size = 0;
8     }
9     void countDigit(){
10        for(int m = num; m != 0; m /= 10)
11            size++;
12    }
13    public int sumOfDigits(int x, int p){
14        if(x < 10)
15            return (int)Math.pow(x, p);
16        else{
17            int t = (int)Math.pow(x % 10, p);
18            return t + sumOfDigits(x / 10, --p);
19        }
20    }
21    public void check(){
22        if(num == sumOfDigits(num, size))
23            System.out.println(num + " is a Disarium Number.");
24        else
25            System.out.println(num + " is not a Disarium Number.");
26    }
27    public static void main(String args[])
28        throws IOException{
29        InputStreamReader in = new InputStreamReader(System.in);
30        BufferedReader br = new BufferedReader(in);
31        System.out.println("Author:D.Aditya Varma\nSAP ID: 51834693");
32        System.out.print("Number: ");
33        int x = Integer.parseInt(br.readLine());
34        Main obj = new Main(x);
35        obj.countDigit();
36        obj.check();
37    }
38 }
```

Output:



```
Author:D.Aditya Varma
SAP ID: 51834693
Number: 175
175 is a Disarium Number.

...Program finished with exit code 0
Press ENTER to exit console.
```

2)import java.util.Arrays;

public class Main

```
{
    private static void sortBinaryArray(int[] inputArray)
    {
        int zeroCount = 0;

        System.out.println("Author:D.Aditya Varma\nSAP ID:51834693");
        System.out.println("Input Array Before Sorting : "+Arrays.toString(inputArray));

        for (int n = 0; n < inputArray.length; n++)
        {
            if (inputArray[n] == 0)
            {
                zeroCount++;
            }
        }

        for (int n = 0; n < zeroCount; n++)
        {
            inputArray[n] = 0;
        }

        for (int n = zeroCount; n < inputArray.length; n++)
        {
            inputArray[n] = 1;
        }

        System.out.println("Input Array After Sorting : "+Arrays.toString(inputArray));
    }

    public static void main(String[] args)
    {
        sortBinaryArray(new int[] {1, 0, 1, 1, 0, 1, 0, 0});
    }
}
```

input:

```
1 import java.util.Arrays;
2
3 public class Main
4 {
5     private static void sortBinaryArray(int[] inputArray)
6     {
7         int zeroCount = 0;
8
9         System.out.println("Author:D.Aditya Varma\nSAP ID:51834693");
10        System.out.println("Input Array Before Sorting : "+Arrays.toString(inputArray));
11
12        for (int n = 0; n < inputArray.length; n++)
13        {
14            if (inputArray[n] == 0)
15            {
16                zeroCount++;
17            }
18        }
19
20        for (int n = 0; n < zeroCount; n++)
21        {
22            inputArray[n] = 0;
23        }
24
25        for (int n = zeroCount; n < inputArray.length; n++)
26        {
27            inputArray[n] = 1;
28        }
29
30        System.out.println("Input Array After Sorting : "+Arrays.toString(inputArray));
31    }
32
33    public static void main(String[] args)
34    {
35        sortBinaryArray(new int[] {1, 0, 1, 1, 0, 1, 0, 0});
36    }
37 }
```

output:

```
Author:D.Aditya Varma
SAP ID:51834693
Input Array Before Sorting : [1, 0, 1, 1, 0, 1, 0, 0]
Input Array After Sorting : [0, 0, 0, 0, 1, 1, 1, 1]

...Program finished with exit code 0
Press ENTER to exit console.
```

```

3)public class Main
{
static int replaceDigit(int a, int numbertobereplaced,
                        int replacingnumber)
{
    int result = 0, multiply = 1;

    while (a % 10 > 0)
    {

        int remainder = a % 10;

        if (remainder == numbertobereplaced)
            result = result + replacingnumber * multiply;

        else
            result = result + remainder * multiply;

        multiply *= 10;
        a = a / 10;
    }
    return result;
}

public static void main(String[] args)
{
    int a = 645, numbertobereplaced = 6, replacingnumber = 5;
    System.out.println("Author:D.Aditya Varma\nSAP ID:51834693");
    System.out.println(replaceDigit(a, numbertobereplaced, replacingnumber));
}
}
input:

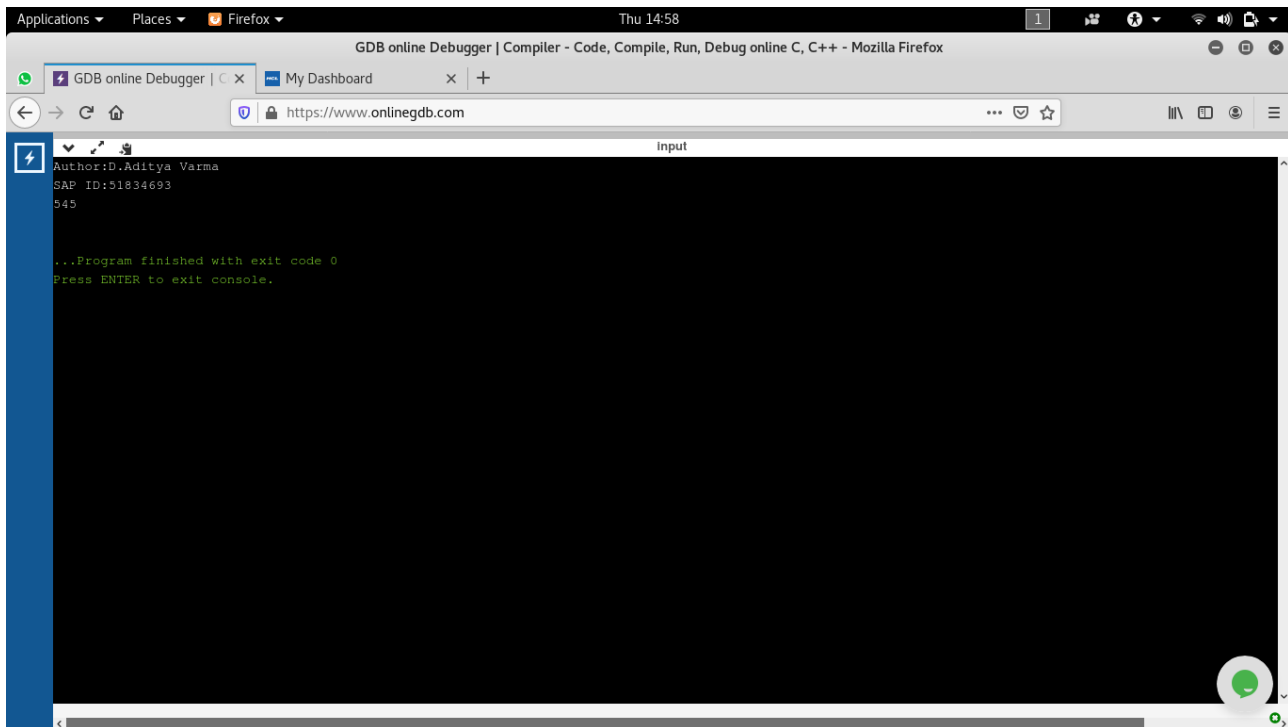
```

```

1 public class Main
2 {
3     static int replaceDigit(int a, int numbertobereplaced,
4                             int replacingnumber)
5     {
6         int result = 0, multiply = 1;
7
8         while (a % 10 > 0)
9         {
10
11             int remainder = a % 10;
12
13             if (remainder == numbertobereplaced)
14                 result = result + replacingnumber * multiply;
15
16             else
17                 result = result + remainder * multiply;
18
19             multiply *= 10;
20             a = a / 10;
21         }
22         return result;
23     }
24
25     public static void main(String[] args)
26     {
27         int a = 645, numbertobereplaced = 6, replacingnumber = 5;
28         System.out.println("Author:D.Aditya Varma\nSAP ID:51834693");
29         System.out.println(replaceDigit(a, numbertobereplaced, replacingnumber));
30     }
31 }

```

Output:



```
5)public class Main
{
    public static int binarySearch(int[] M, int left, int right, int n)
    {
        if (left > right) {
            return -1;
        }

        int mid = (left + right) / 2;

        if (n == M[mid]) {
            return mid;
        }

        else if (n < M[mid]) {
            return binarySearch(M, left, mid - 1, n);
        }

        else {
            return binarySearch(M, mid + 1, right, n);
        }
    }

    public static void main(String[] args)
    {
        int[] M = { 2, 5, 6, 8, 9, 10 };
        int key = 3;
```

```

int left = 0;
int right = M.length - 1;

int index = binarySearch(M, left, right, key);

System.out.println("Author:D.Aditya Varma\nSAP ID: 51834693");
if (index != -1) {
    System.out.println("Element found at index " + index);
} else {
    System.out.println("Element not found in the array");
}
}

```

Input:

```

1 public class Main
2 {
3     public static int binarySearch(int[] M, int left, int right, int n)
4     {
5         if (left > right) {
6             return -1;
7         }
8
9         int mid = (left + right) / 2;
10
11         if (n == M[mid]) {
12             return mid;
13         }
14
15         else if (n < M[mid]) {
16             return binarySearch(M, left, mid - 1, n);
17         }
18
19         else {
20             return binarySearch(M, mid + 1, right, n);
21         }
22     }
23
24     public static void main(String[] args)
25     {
26         int[] M = { 2, 5, 6, 8, 9, 10 };
27         int key = 3;
28
29         int left = 0;
30         int right = M.length - 1;
31
32         int index = binarySearch(M, left, right, key);
33
34         System.out.println("Author:D.Aditya Varma\nSAP ID: 51834693");
35         if (index != -1) {
36             System.out.println("Element found at index " + index);
37         } else {
38             System.out.println("Element not found in the array");
39         }
40     }
41 }
42

```

output:

```

Author:D.Aditya Varma
SAP ID: 51834693
Element not found in the array

...Program finished with exit code 0
Press ENTER to exit console.

```