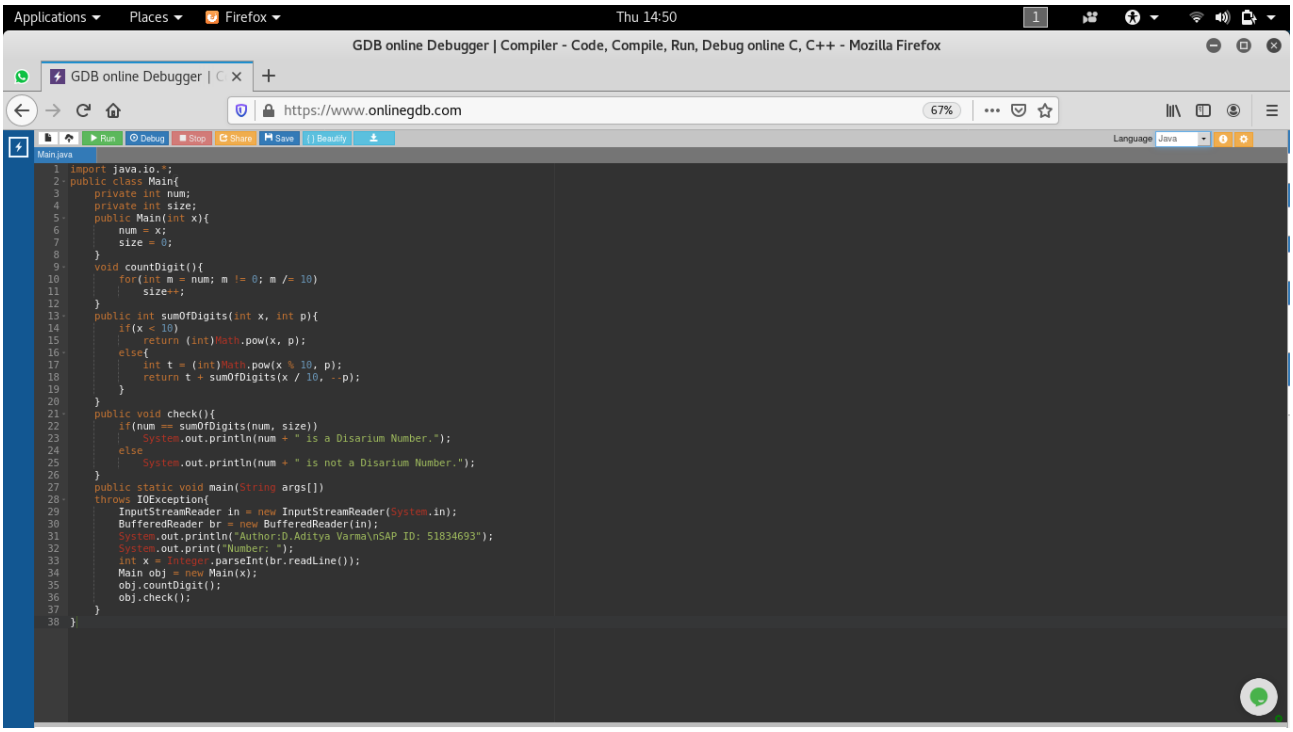
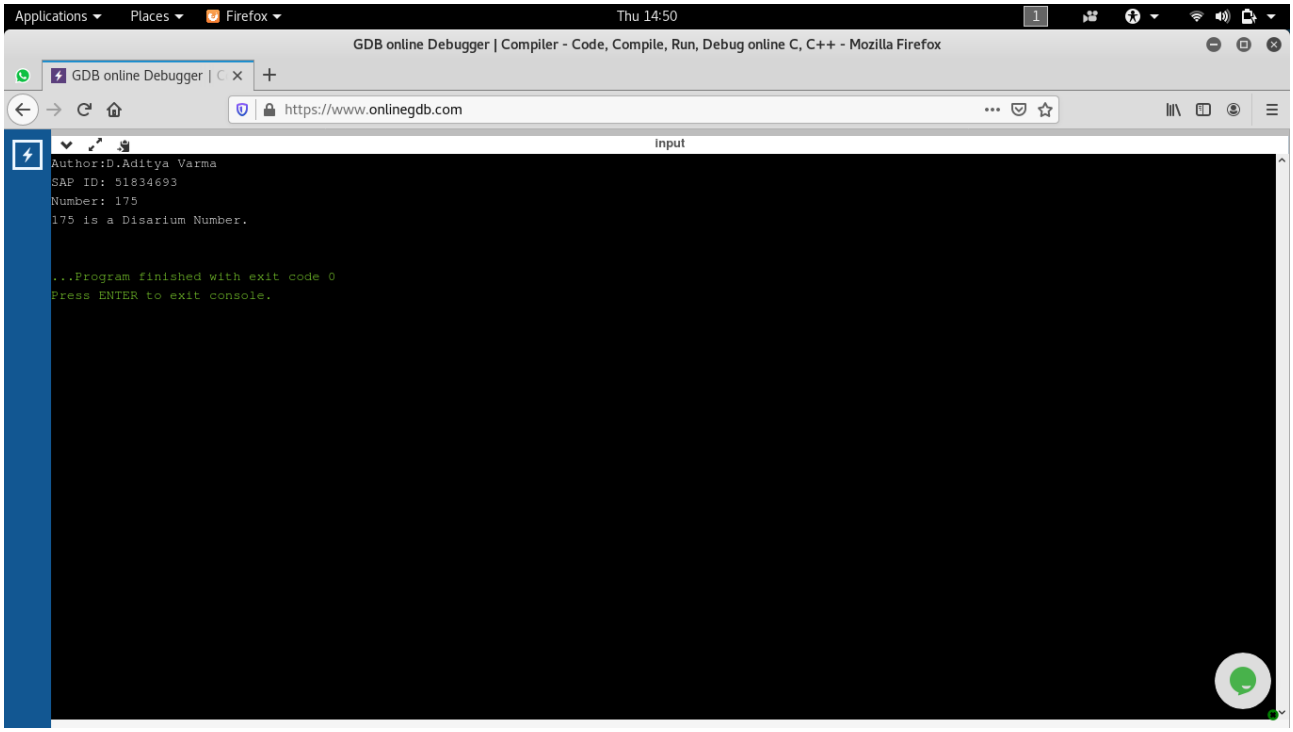
1)

```
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:



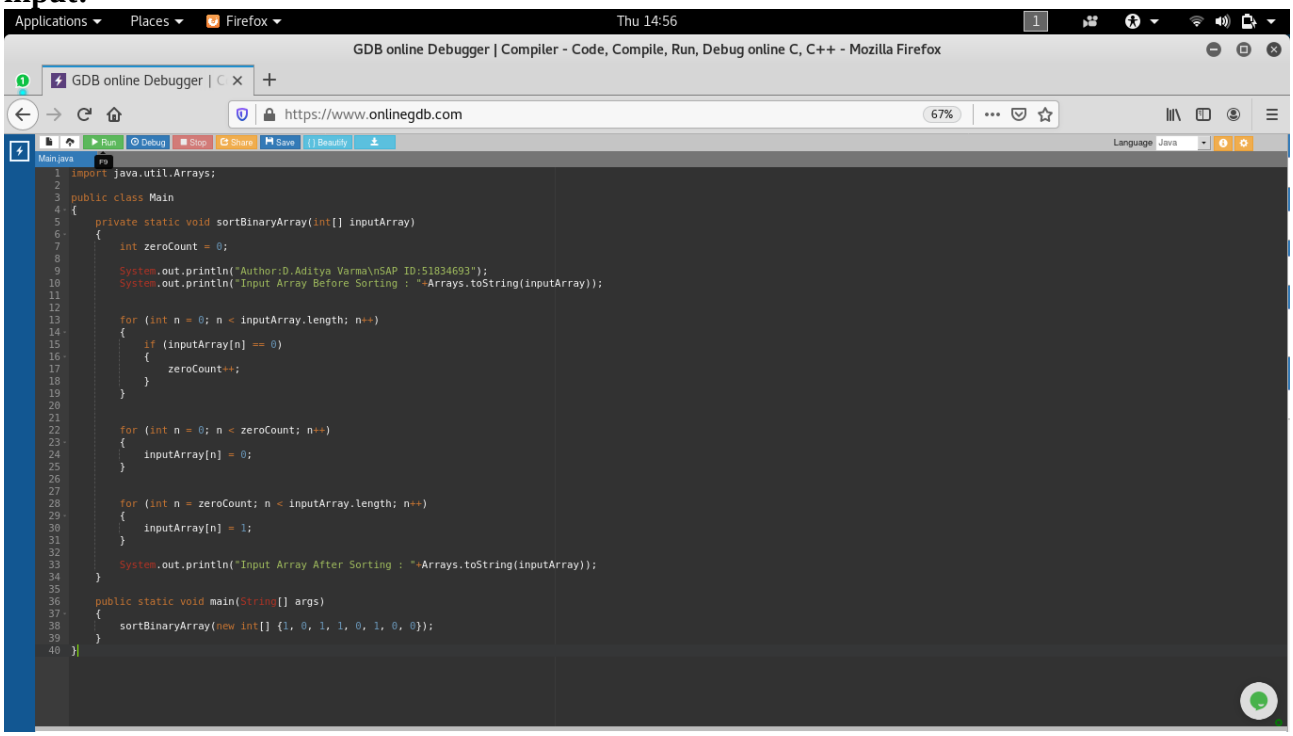
Output:



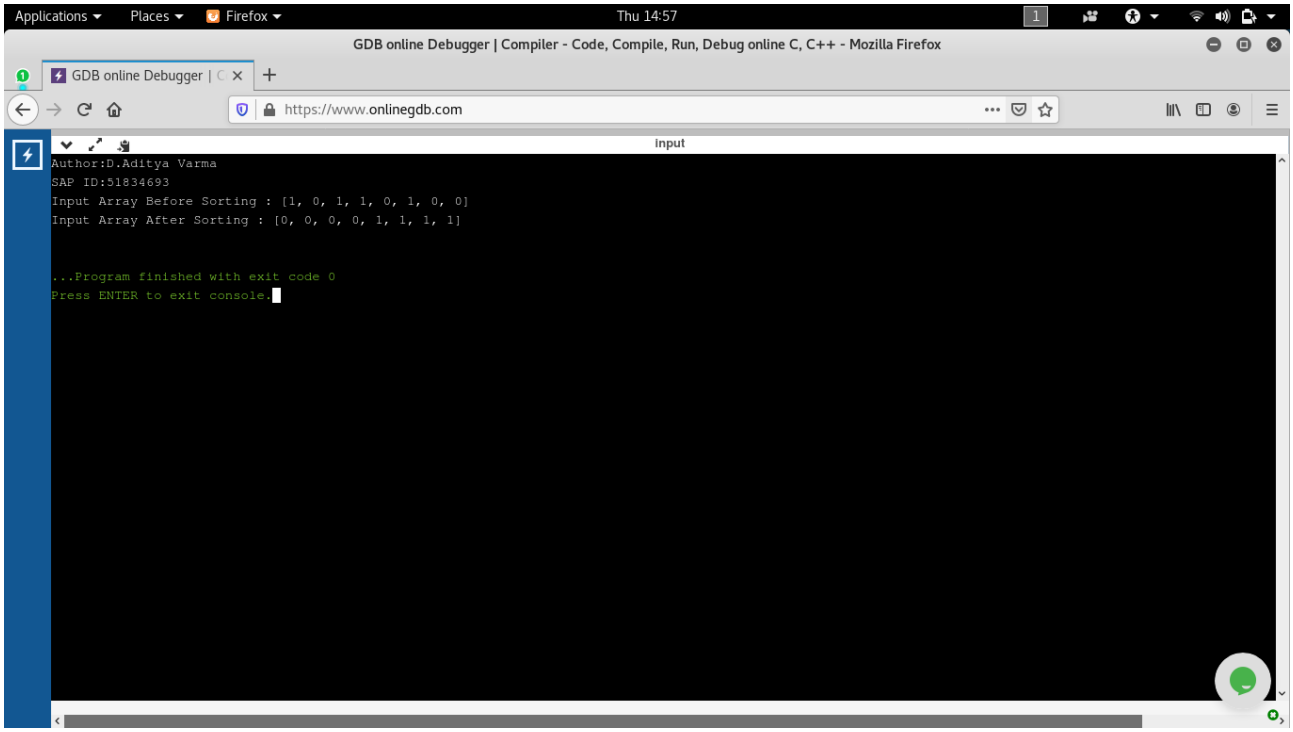
2)

```
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:



output:



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

while (a % 10 > 0)
{

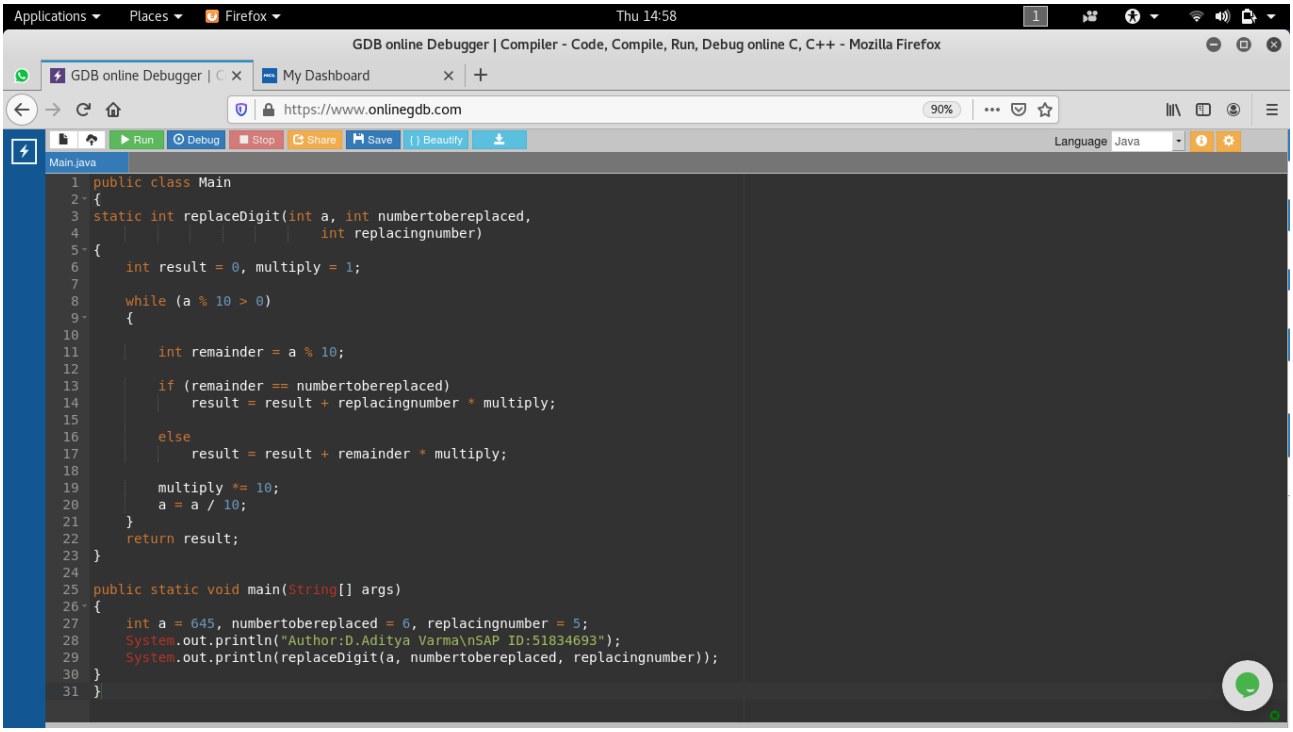
int remainder = a % 10;

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

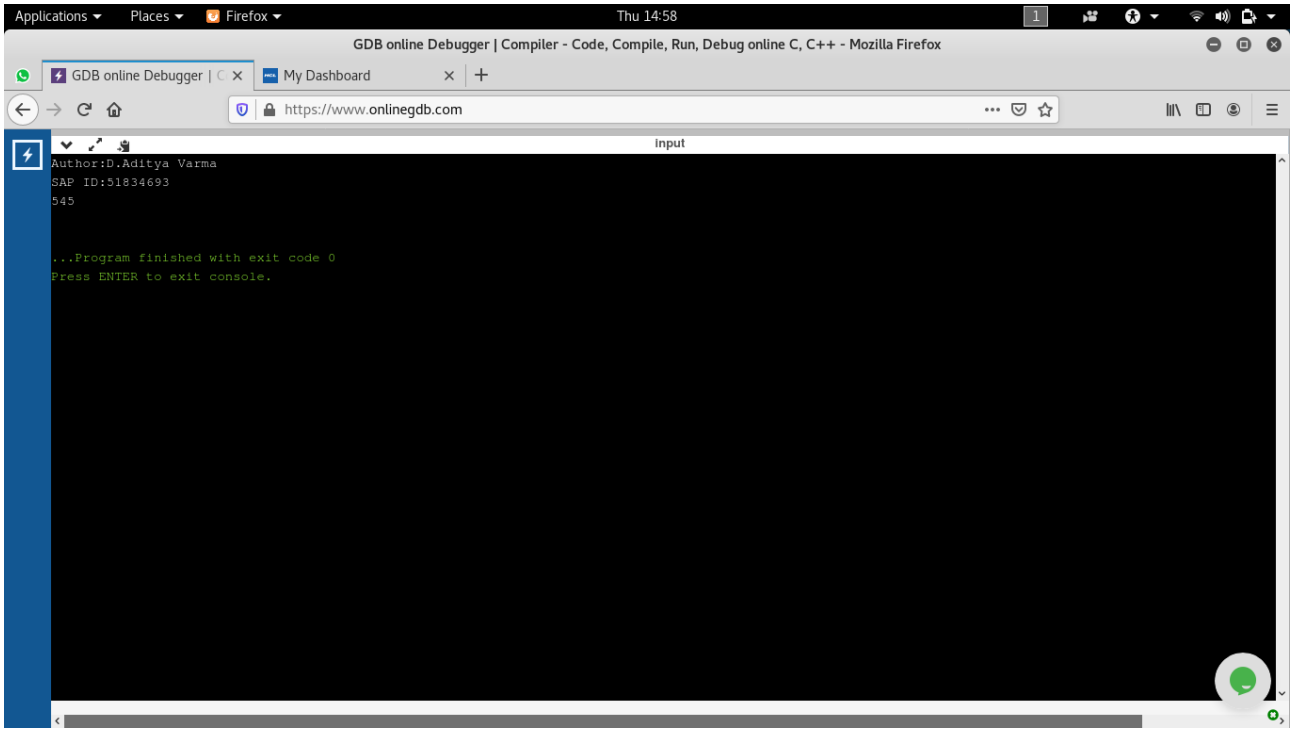
else
result = result + remainder * multiply;

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:



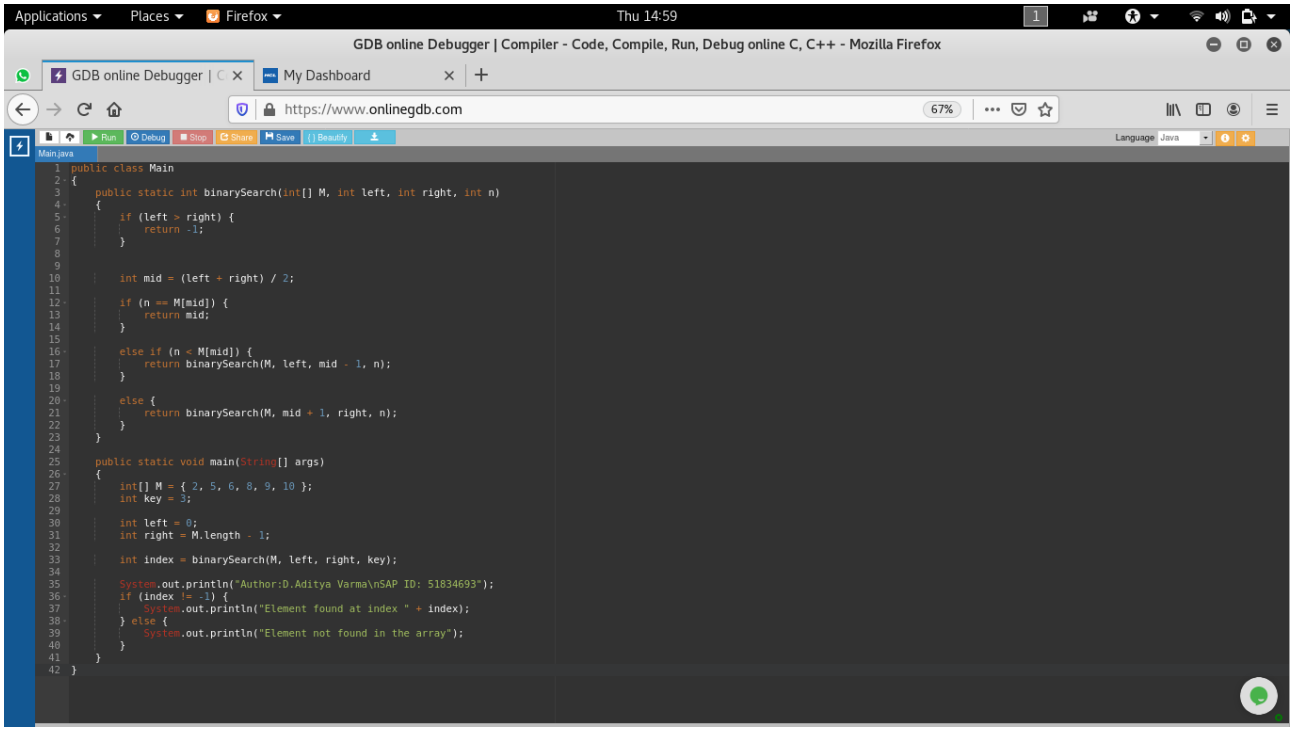
Output:



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:



output: