

Program 1

```
import java.util.Scanner;
import java.io.*;
public class CRC1 {

    public static void main(String args[]) {

        Scanner sc = new Scanner(System.in);

        //Input Data Stream
        System.out.print("Enter message bits: ");
        String message = sc.nextLine();
        System.out.print("Enter generator: ");
        String generator = sc.nextLine();
        int data[] = new int[message.length() + generator.length() - 1];
        int divisor[] = new int[generator.length()];
        for(int i=0;i<message.length();i++)
            data[i] = Integer.parseInt(message.charAt(i)+"");
        for(int i=0;i<generator.length();i++)
            divisor[i] = Integer.parseInt(generator.charAt(i)+"");

        //Calculation of CRC
        for(int i=0;i<message.length();i++)
        {
            if(data[i]==1)
                for(int j=0;j<divisor.length;j++)
                    data[i+j] ^= divisor[j];
        }

        //Display CRC
        System.out.print("The checksum code is: ");
        for(int i=0;i<message.length();i++)
            data[i] = Integer.parseInt(message.charAt(i)+"");
        for(int i=0;i<data.length;i++)
            System.out.print(data[i]);
        System.out.println();

        //Check for input CRC code
        System.out.print("Enter checksum code: ");
        message = sc.nextLine();
        System.out.print("Enter generator: ");
        generator = sc.nextLine();
        data = new int[message.length() + generator.length() - 1];
        divisor = new int[generator.length()];
        for(int i=0;i<message.length();i++)
            data[i] = Integer.parseInt(message.charAt(i)+"");
```

```

for(int i=0;i<generator.length();i++)
divisor[i] = Integer.parseInt(generator.charAt(i)+"");

//Calculation of remainder
for(int i=0;i<message.length();i++) {
if(data[i]==1)
for(int j=0;j<divisor.length;j++)
data[i+j] ^= divisor[j];
}

//Display validity of data
boolean valid = true;
for(int i=0;i<data.length;i++)
if(data[i]==1){
valid = false;
break;
}

if(valid==true)
System.out.println("Data stream is valid");
else
System.out.println("Data stream is invalid. CRC error occurred.");
}

}

```

Output

```

Enter message bits: 1101011011
Enter generator: 10011
The checksum code is: 11010110111110
Enter checksum code: 11010110111110
Enter generator: 10011
Data stream is valid

```