13 | Write a program for error detecting code using CRC

```java
import java.util.Scanner;
import java.util.Arrays;

class Program {
    static String xor (String a, String b)
    {
        String result = " ";
        int n = b.length();
        for (int i = 1; i < n; i++)
        {
            result = (a.charAt(i) == b.charAt(i))
                     ? 0 : 1;
        }
        return result;
    }
    static String div (String data, String key)
    {
        int pick = key.length();
        String tmp = data.substring(0, pick);
        int n = data.length();
        while (pick < n)
        {
            if (temp.charAt(0) == '1')
                tmp = xor(data, temp) +
                data.charAt(pick);
            else tmp = xor(new String(new char
            [pick]).replace("\0", "0"), temp) +
            return temp;
        }
    }
    static void encode (String data,
    String key)
    {
        int pick = key.length();
```

```
string append-data = (data+ new string
(new char [ Key - 1]). replace ("\0",'0'));
string remainder = Mod2Div (appended-data,
                                        key);

string codeword = data + remainder;
System. out. println ("Remainder: " + remainder);
System. out. println (" Encoded Data
        (Data+Remainder): " + codeword + "\n");
public static void main (string [] args)
    {   Scanner S = new Scanner (System. in);
System. out. println (" enter dataword and
                    key");
    String data = S. next ();
    String key = S. next ();
    Encode Data (data, key);
    }
}
```

output

```
Enter dataword: 1100 101011100100 1
Calculated CRC: 111 0100101110 0 1
```

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```
C:\Users\Admin\Desktop\1BM21CS047\ADA\CRC16\bin\Debug\CRC16.exe

Enter the dataword
1 0 1 1 0 0 1 1 1 1 0 0 1 0 1 1 1
Enter dividend
1 0 0 0 1 0 0 0 0 0 0 1 0 0 0 1 1
Codeword: 10110011110010111000000000011011
At receiver end
Codeword: 10110011110010111000000000000000
Process returned 1 (0x1)   execution time : 49.507 s
Press any key to continue.
```