Write a program to
Error detection using CRC-CCITT (16 bits)

```
#include <stdio.h>
#include <string.h>
#define N strlen(gen-poly)
char    data[28];
char    check-Value[28];
char    gen-poly[10];
int     data-length, i, j;
void    XOR() {
            for(j=1; j<N; j++)
                check-value[j] = ((check-value[j] == gen-poly[j])?
                                                                    '0':'1');
        }


void    receiver() {
            printf("Enter data received data");
            scanf("%s", data);
            printf("Data received :%s", data);
            crc();
            for(i=0; i<N-1) && (check-value[i]!= '1'); i++);
                if(i<N-1)
                    printf("Error detected \n");

                else
                    printf("No error detected");

        }

void crc()
{
    for(i=0; i<N; i++)
        check-value[i] = data[i];

    do{
        if(check-value[0] == '1')
            XOR();
        for(j=0; j<N; j++)
            check-value[j] = check-value[j+1];
            check-value[j] = data[i++];
    }while(i<= data-length+N-1);

}
```

```c
int main ()
{
    printf ("Enter data to be transmitted ");
    scanf ("%s", data);
    printf ("Enter the generating polynomial ");
    scanf ("%s", gen-poly);
    data- length = strlen (data);
    for (i = data- length ; i< data-length+N-1; i++)
        data [i] = '0';

    crc ();

    for (i =data-length; i<data length+N-1; i++)
        data[i] = check-value [i-data-length];

    receiver ();

    return 0;

}
```

Output:

Enter data to be transmitted : 101101010l

Enter generating polynomial : 1011

Data padded with n-1 zeroes: 101101010l000

CRC or check value is : 101

Final data to be sent :1011010101101

Enter the received data: 1011010101101

Data received : 1011010101101

No error detected.

29/12/22

Enter codeword : 101101010l

Enter generating Polynomial : 1010

Data with zeros : 1011010101010000

CRC value is 000

Final data to be sent is : 1011010101010000

Enter data received : 1011010101010000

Error detected

```
Enter codeword: 1011010101

 Enter the Generating polynomial: 1010

 Data padded with n-1 zeros : 1011010101000
CRC or Check value is : 000
 Final data to be sent : 1011010101000
Enter the received data:
1011010101001
Data received: 1011010101001
Error detected
```

```
Enter codeword: 1011010101

 Enter the Generating polynomial: 1010

 Data padded with n-1 zeros : 1011010101000
CRC or Check value is : 000
 Final data to be sent : 1011010101000
Enter the received data:
1011010101000
Data received: 1011010101000
No error detected
```