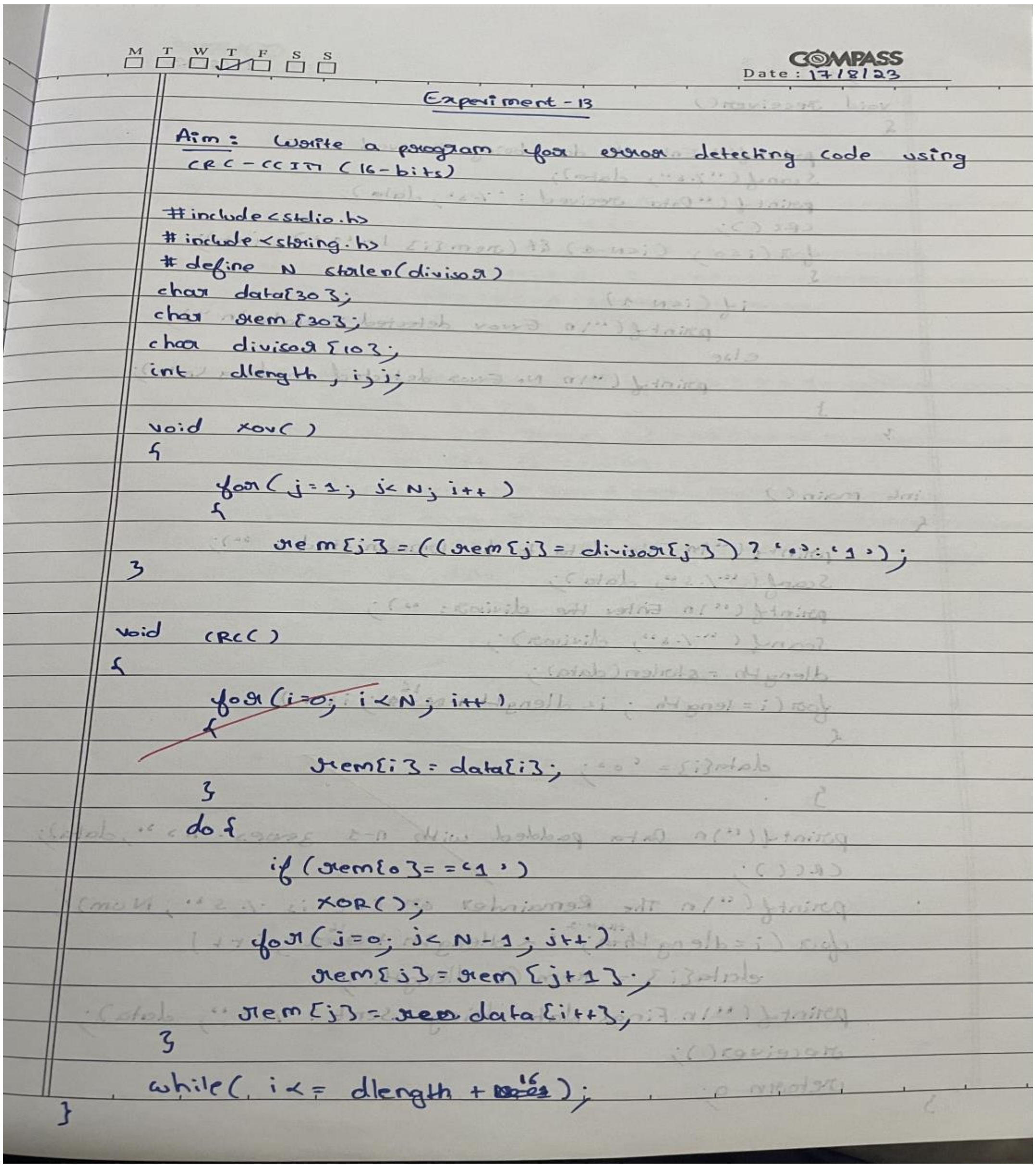
CYCLE II

LAB PROGRAM – 13

Q) Write a program for error detecting code using CRCCCITT (16-bits)

Procedure :



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Date : 17/8/23

Experiment - 13

Aim : Write a program for error detecting code using CRC - CCITT (16-bits)

```
#include<stdio.h>
# include<string.h>
# define N strlen(divisor)
char data[30];
char rem[30];
char divisor[10];
int dlength, i, j;

void xor( )
{
    for( j=1; j< N; i++ )
    {
        rem[j] = ((rem[j] = divisor[j] ) ? '0':'1');
}

void CRC( )
{
    for(i=0; i<N; i++)
    {
            rem[i] = data[i];
    }
    do{
        if (rem[0]= ='1')
            XOR();
        for(j=0; j< N-1; j++)
            rem[j] = rem [j+1];
        rem[j] = ~~rem~~ data[i++];
    }
    while( i<= dlength + 16);
}
```

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COMPASS

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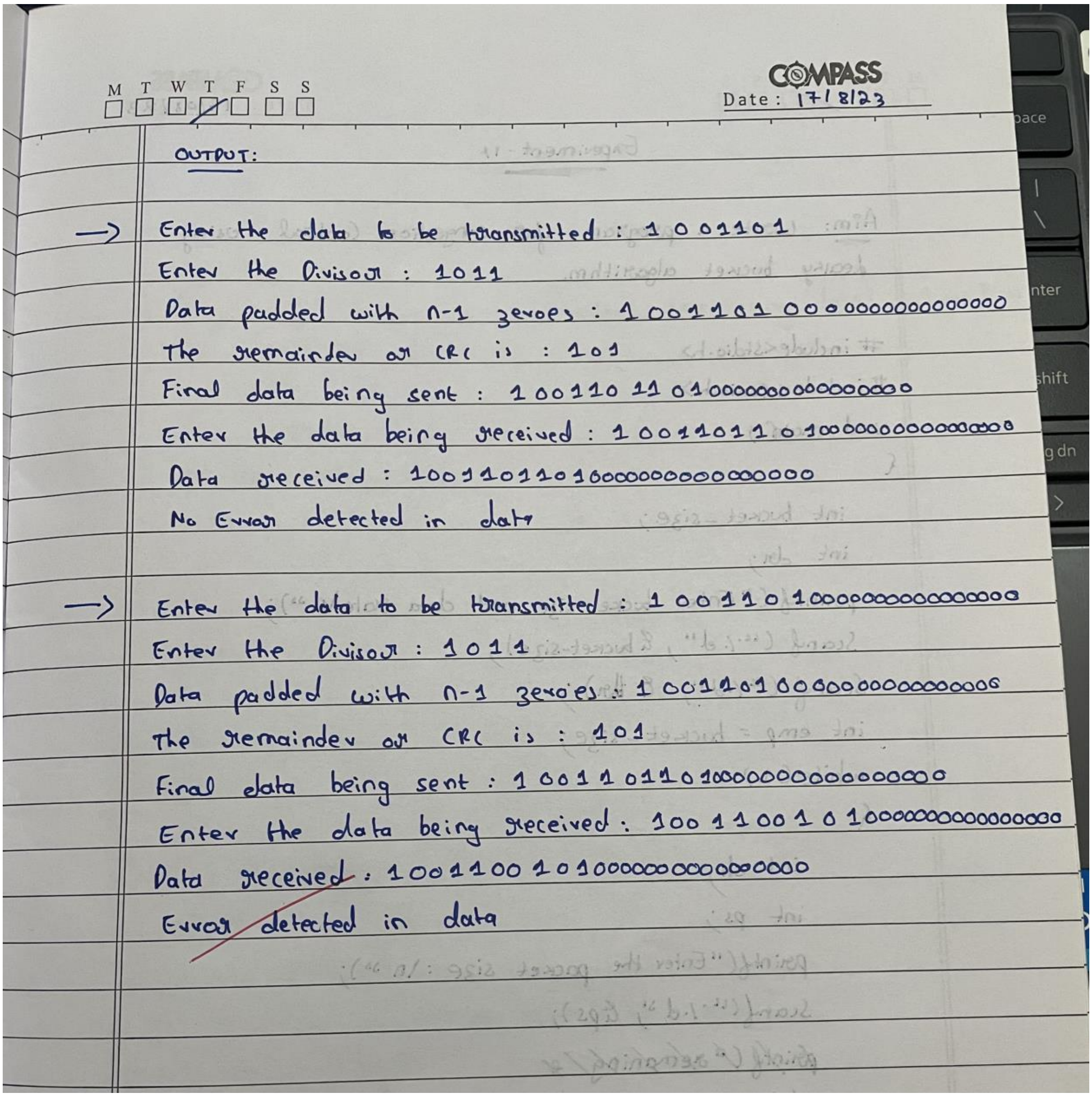
```
void receiver()
{
    printf(" Enter the data being recived : ");
    Scanf("%s", data);
    printf("Data recived : '%s', data);
    CRC();
    for(i=0; (i<N-1) && (rem[i] != '1'); i++);
    {
        if(i<N-1)
            printf("\n Error detected in data\n").
        else
            printf("\n No Error detected in data \n");
    }
}

int main()
{
    printf("\n Enter data to be transmitted : ");
    Scanf("%s", data);
    printf("\n Enter the divisor: ");
    Scanf("%s", divisor);
    dlength = strlen(data);
    for(i=length ; i<dlength+16; i++)
    {
        data[i] = '0';
    }
    printf(")n Data padded with n-1 zeroes: %s ", data);
    CRC();
    printf("\n The Remainder or CRC is %s ", Num);
    for(i=dlength+16+N-1; i<dlength+16; i++)
        data[i] = rem(i-dlength);
    printf("\n Final data being sent : %s ", data);
    receiver();
    return 0;
}
```



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OUTPUT:

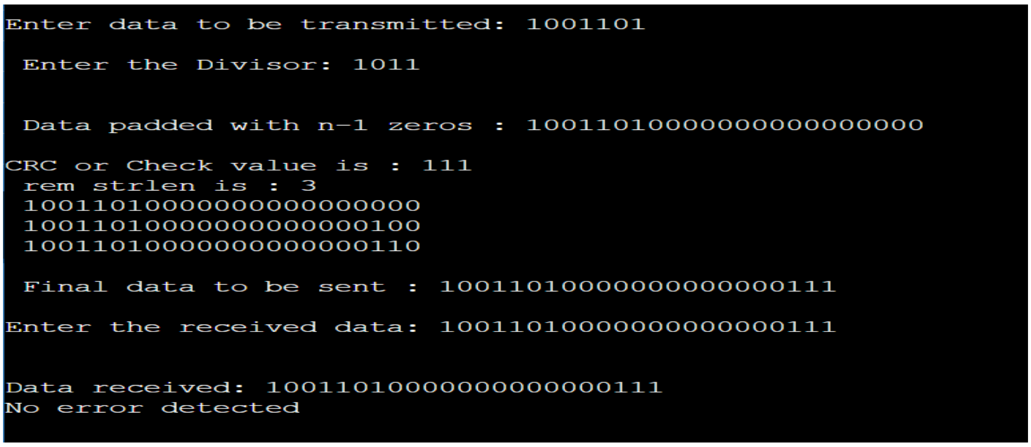
```
Enter the data to be transmitted : 1001101
Enter the Divisor : 1011
Data padded with n-1 zeroes : 1001101 000000000000000000
The remainder or CRC is : 101
Final data being sent : 100110 11 01000000000000000000
Enter the data being received : 10011011 0100000000000000000
Data received : 100110110100000000000000000
No Error detected in data

Enter the data to be transmitted : 100110 1000000000000000000
Enter the Divisor : 1011
Data padded with n-1 zeroes : 1001101 000000000000000000
The remainder or CRC is : 101
Final data being sent : 10011011 0100000000000000000
Enter the data being received : 100 1100 1 0 10000000000000000000
Data received : 1001100 1 0100000000000000000
Error detected in data
```

Code :

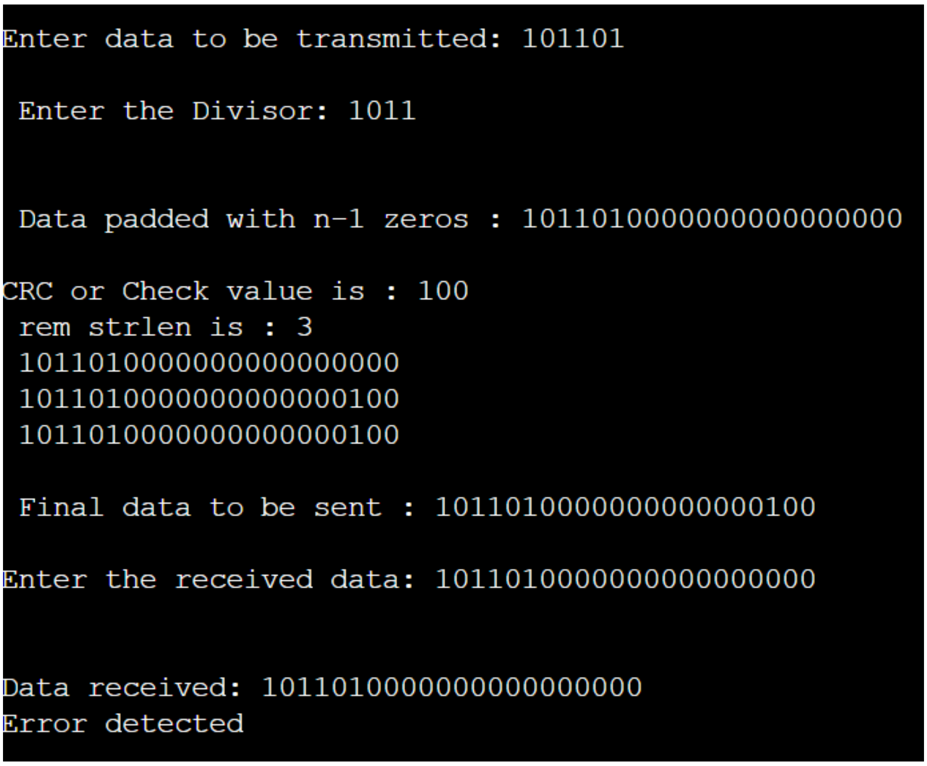
```
#include<stdio.h>
#include<string.h>
#define N strlen(divisor)
char data[28];
char rem[28];
char divisor[10];
int dlength,i,j;
void XOR(){
    for(j = 1;j < N; j++)
    rem[j] = (( rem[j] == divisor[j])?'0':'1');

}
```

```
void receiver(){

    printf("Enter the received data: ");
    scanf("%s", data);
    printf("\n\n");
    printf("Data received: %s", data);

    crc();

    for(i=0;(i<N-1) && (rem[i]!='1');i++);
        if(i<N-1)
            printf("\nError detected\n\n");
        else
            printf("\nNo error detected\n\n");
}

void crc(){

    for(i=0;i<N;i++)
        rem[i]=data[i];
    do{

        if(rem[0]=='1')
            XOR();

        for(j=0;j<N-1;j++)
            rem[j]=rem[j+1];

        rem[j]=data[i++];
    }
    while(i<=dlength+16);

}

int main()
{  int c=0;

    printf("\nEnter data to be transmitted: ");
    scanf("%s",data);
    printf("\n Enter the Divisor: ");
    scanf("%s",divisor);
    dlength=strlen(data);
    for(i=dlength;i<dlength+16;i++)
        data[i]='0';
    printf("\n");
    printf("\n Data padded with n-1 zeros : %s",data);
    printf("\n");
    crc();
    printf("\nCRC or Check value is : %s",rem);
    printf("\n rem strlen is : %d ", strlen(rem));
    for(i=dlength+13;i<dlength+16;i++)
       {    printf("\n %s",data);
           data[i]= rem[c++];
           }
    printf("\n");

    printf("\n Final data to be sent : %s",data);
    printf("\n\n");

    receiver();
        return 0;
}
```

Output :



```
Enter data to be transmitted: 1001101

 Enter the Divisor: 1011


 Data padded with n-1 zeros : 10011010000000000000000

CRC or Check value is : 111
 rem strlen is : 3
 10011010000000000000000
 10011010000000000000100
 10011010000000000000110

 Final data to be sent : 10011010000000000000111

Enter the received data: 10011010000000000000111


Data received: 10011010000000000000111
No error detected
```



```
Enter data to be transmitted: 101101

 Enter the Divisor: 1011


 Data padded with n-1 zeros : 1011010000000000000000

CRC or Check value is : 100
 rem strlen is : 3
 1011010000000000000000
 1011010000000000000100
 1011010000000000000100

 Final data to be sent : 1011010000000000000100

Enter the received data: 1011010000000000000000


Data received: 1011010000000000000000
Error detected
```