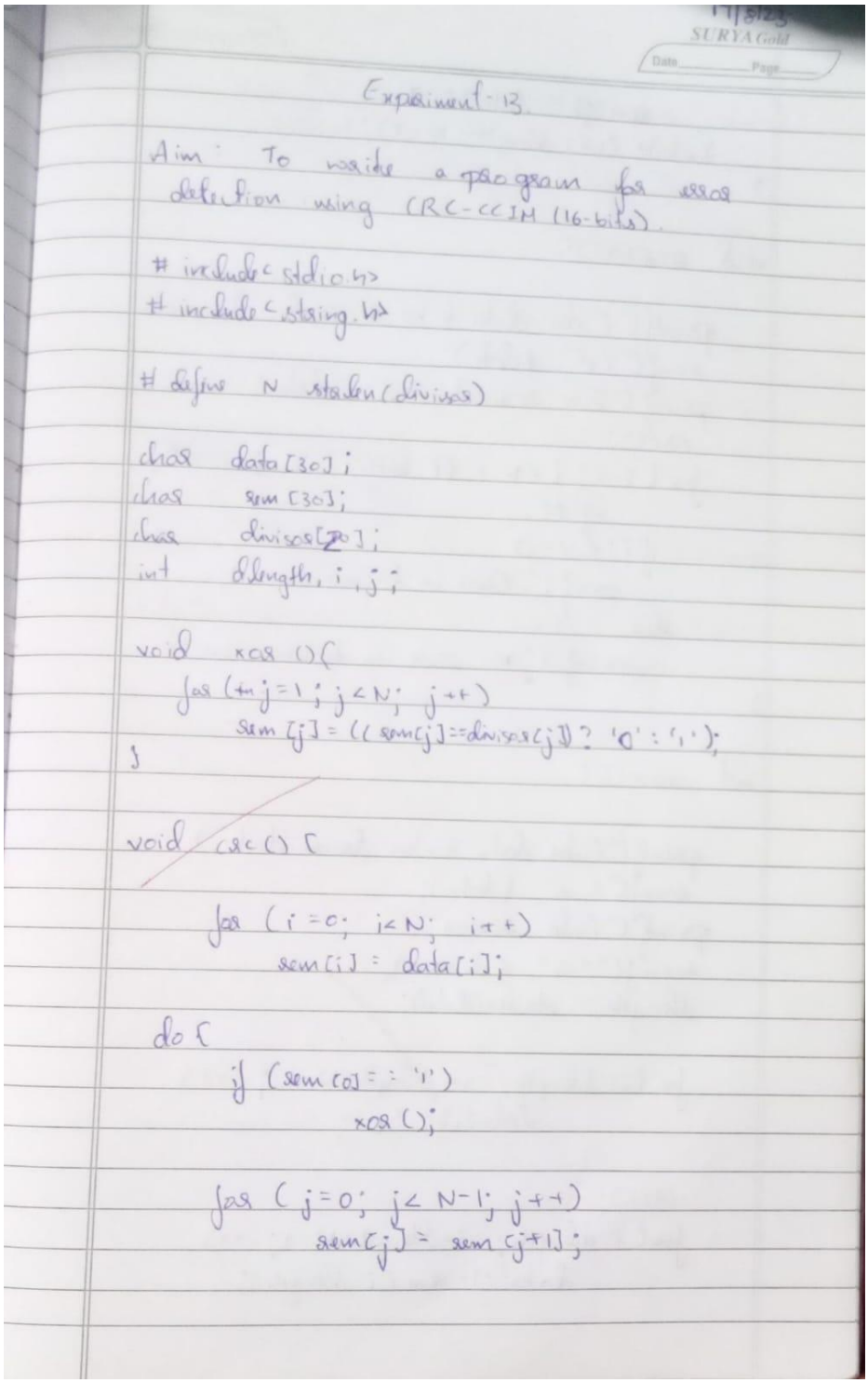
EXPERIMENT- 13

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



Experiment-13

Aim: To write a program for error detection using CRC-CCITT (16-bits).

```
#include<stdio.h>
#include<string.h>

#define N strlen(divisor)

char data[30];
char rem[30];
char divisor[30];
int dlength, i, j;

void xor(){
    for(j=1; j<N; j++)
        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] = data[i++];
    } while (i <= dlength + N - 1);
}

void receiver(){

    printf("Enter data to be received: ");
    scanf("%d", &data);
    printf("Data received: %s", data);
    crc();
    for(i=0; i<N-1 && rem[i]!='1'; i++);
        if(i<N-1)
            printf("Errors in transmission");
        else
            printf("No errors in transmission");
}

int main(){

    printf("Enter data to be transmitted");
    scanf("%s", &data);
    printf("Enter divisor");
    scanf("%s", &divisor);
    dlength = strlen(data);

    for(i=dlength; i<dlength+N-1; i++)
            data[i]='0';

    crc();
    for(i=dlength; i<dlength+N-1; i++)
            data[i]=rem[i-dlength];
```

```
    printf("Data being sent: %s", data);
    receiver();

    return 0;
}
```

Output:

Enter data to be transmitted
1011
Enter divisor
100 01000000100001
Data being sent: 1011 10 100 11011000 1

Enter data recieved : 10 11 10 100 11011 0000
Data recieved : 10 11 10 100 11011 0000
Error in transmission

Code:

```
def crc(s: str)->str:

    bits=[int(t) for t in s]

    polynomial=0b10001000000100001

    crc=0b1111111111111111



    for bit in bits:

        crc^=(bit<<15)

        if (crc>>15)&1:

            crc=(crc<<1)^polynomial

        else:

            crc<<=1



    crc&=0b1111111111111111

    return bin(crc)[2:].zfill(16)



data=input("Enter data ")

rem=crc(data)

print("Remainder will be:",rem)

print("Data being transmitted is: ",(data+rem))
```

```
rec=input("Enter recieved data ")

r=crc(rec)

print(r)

if int(r)==0:

    print("No Error detected")

else:

    print("Error detected")
```

Result:

```
PS C:\Users\aravi\OneDrive\Desktop\notes\CN> & C:/Python311/python.exe c:/U
Enter data 1011
Remainder will be: 1011111101110100
Data being transmitted is:  10111011111101110100
Enter recieved data 10111011111001110100
0011001100110001
Error detected
```

```
PS C:\Users\aravi\OneDrive\Desktop\notes\CN> & C:/Pythor
Enter data 1011
Remainder will be: 1011111101110100
Data being transmitted is:  10111011111101110100
Enter recieved data 10111011111101110100
0000000000000000
No Error detected
```