Date 29/12/22
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Cycle 2

Lab: Week 7 CRC

Exp 1: Write a program for error detecting code using CRC-CCITT (16 bits)

Program:

```
#include <stdio.h>
#include <string.h>
#define N strlen(gen_poly)
char data[30];
char check_value[30];
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 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);
}
void receiver(){
    printf("Enter the data received at receiver site:");
    scanf("%s", data);
    printf("Data received: %s", data);
```

```
xor();
for (i=0; i<N-1) && (check_value[i] != '1'); i++);
    if (i<N-1){
        printf("\n CRC at receiver site is: %s", check_value);
        printf("\n Error detected!\n\n");
    }
    else {
        printf("\n CRC at receiver site is: %s",
                check_value);
        printf("\n No error detected\n\n");
    }
}
int main(){
    printf("\n Enter data to be transmitted:");
    scanf("%s", data);
    printf("\n 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';
    printf("\n Padded Data: %s", data);
    xor();
    printf("\n CRC at sender site is: %s", check_value);
    for (i=data_length; i<data_length+N-1; i++)
        data[i] = check_value[i-data_length];
    printf("\n Final data to be sent from sender site:
            %s\n", data);
    receiver();
    return 0;
}
```

$x^{16} + x^{12} + x^5 + 1$

OUTPUT:

Enter data to be transmitted : 1011010101
Enter the Generating Polynomial : 1010
Padded Data : 1011010101000
CRC at sender site : 000
Final data to be sent from sender site : 1011010101000
Enter the data received at receiver site : 1011010101000
Data received : 1011010101000
CRC at receiver site is : 000
No error detected

Enter data to be transmitted : 1011010101
Enter the Generating Polynomial : 1010
Padded Data : 1011010101000
CRC at sender site is : 000
Final data to be sent from sender site : 1011010101000
Enter the data received at receiver site : 1111010101000
Data received : 1111010101000
CRC at receiver site is : 010
Error detected !

```
Enter data to be transmitted: 1011010101

Enter the Generating polynomial: 1010

Padded Data: 1011010101000
CRC at sender site is: 000
Final data to be sent from sender site: 1011010101000
Enter the date received at receiver site: 1011010101000
Data received: 1011010101000
CRC at receiver site is: 000
No error detected


...Program finished with exit code 0
Press ENTER to exit console.
```

```
Enter data to be transmitted: 1011010101

Enter the Generating polynomial: 1010

Padded Data: 1011010101000
CRC at sender site is: 000
Final data to be sent from sender site: 1011010101000
Enter the date received at receiver site: 1111010101000
Data received: 1111010101000
CRC at receiver site is: 010
Error detected!



...Program finished with exit code 0
Press ENTER to exit console.
```