29/12/22

Lab 7

Error detection using CRC-CCITT (16 bit)

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

```
#include <bits/stdc++.h>
#define N strlen(gen_poly)
char data[28];
char check_value[28], 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-1; j++)
            check_value[j]= check_value[j+1];
        check_value[j] = data[i++];
    }
    while(i<=data_length+N-1);
}
```

```
void receiver(){
    printf("Enter the 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");
        else
            printf("No error");
    }

int main(){
    printf("Enter data to be sent");
    scanf("%s", data);
    printf("Enter generating polynomial");
    scanf("%s", gen_poly);
    data_length = strlen(data);
    for(i=data_length; i<data_length+N-1; i++)
        data[i] = '0';
    printf("Data added with n-1 zeros: %s", data);
    crc();
    printf("CRC or check value is %s", check_value);
    for(i=data_length; i<data_length+N-1, i++)
        data[i] = check_value[i-datalength];
    printf("Final data to send: %s", data);
    receiver();
        return 0;
}
```

Output 1:

Enter data to send: 1000100000001 00001

Enter generator polynomial: 10 111 01

Data added with n-1 zeros: 1000100000001 0000 10 100 0000

CRC or check value is: 010011

Final data to be sent: 1000100000001 0000 10 10011

Data received: 1000100000001 0000 10 10011

No error

Output 2:

Enter data to send: 1000100000001 00001

Enter generator polynomid: 10 111 01

Data added with n-1 zeros: 1000100000001 0000 1000000

CRC or check value is: 010011

Final data to be sent: 1000100000001 0000 10 10011

Data received: 1000100000001 0000 10 10000

Error detected.

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FINAL OUTPUT