

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[255];
char check_value[255], gen_poly[16];
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 + 1];
    }
    while (i <= data_length + 16 - 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] != 'i'); 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-data-length];
    printf("Final data to send: %s", data);
    receiver();
    return 0;
}

```


Output 1:

Enter data to send: 10001000000100001

Enter generator polynomial: 1011101

Data added with $n-1$ zeros: 100010000001000010000000

CRC or check value is: 010011

Final data to be sent: 10001000000100001010011

Data received: 10001000000100001010011

No error

Output 2:

Enter data to send: 100010000001000001

Enter generator polynomial: 1011101

Data added with $n-1$ zeros: 100010000001000001000000

CRC or check value is: 010011

Final data to be sent: 100010000001000001010011

Data received: 100010000001000001010000

Error detected.

Wav
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