

Experiment-13

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Write a program to show error detection using crc-ccit(16bits)

Code:

```
#include<stdio.h>

#include<string.h>

#define N strlen(gen_poly)

char data[28];

char check_value[28];

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 receiver(){

    printf("Enter the received data: ");

    scanf("%s", data);

    printf("\n-----\n");

    printf("Data received: %s", data);

    crc();

    for(i=0;(i<N-1) && (check_value[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++)
        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);
}

```

```

int main()
{
    // get the data to be transmitted
    printf("\nEnter data to be transmitted: ");
    scanf("%s",data);
    printf("\n Enter the Generating polynomial: ");
    // get the generator polynomial
    scanf("%s",gen_poly);
}

```

```

// find the length of data
data_length=strlen(data);

// appending n-1 zeros to the data
for(i=data_length;i<data_length+N-1;i++)
    data[i]='0';

printf("\n-----");

// print the data with padded zeros
printf("\n Data padded with n-1 zeros : %s",data);
printf("\n-----");

// Cyclic Redundancy Check
crc();

// print the computed check value
printf("\nCRC or Check value is : %s",check_value);

// Append data with check_value(CRC)
for(i=data_length;i<data_length+N-1;i++)
    data[i]=check_value[i-data_length];
printf("\n-----");

// printing the final data to be sent
printf("\n Final data to be sent : %s",data);
printf("\n-----\n");

// Calling the receiver function to check errors
receiver();

return 0;

}

```

Output:

```
Enter data to be transmitted: 110011011
Enter the Generating polynomial: 11011
-----
Data padded with n-1 zeros : 1100110110000
-----
CRC or Check value is : 1100
-----
Final data to be sent : 1100110111100
-----
Enter the received data: 1100110111101
-----
Data received: 1100110111101
Error detected
```