Experiment-13

USN:1BM21CS271

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)
```

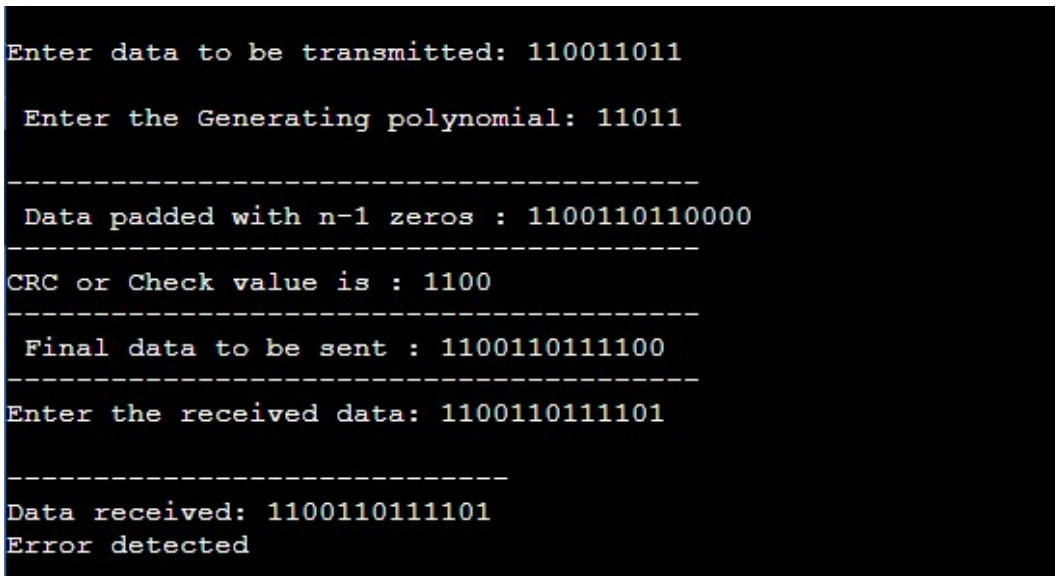
```
            printf("\nError detected\n\n");
        else
            printf("\nNo error detected\n\n");
}

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