## **LAB 13**

Write a program for error detecting code using CRC- CCITT (16-bits).

```
CODE:
#include<stdio.h>
int arr[17];
void xor(int x[], int y[])
{
  int k=0;
  for(int i=1;i<16;i++)
  \{ if(x[i]==y[i]) \}
        arr[k++]=0;
     else
        arr[i]=1;
  }
}
void main()
{ int dd[17],div[33],ze[17],i,k;
  printf("Enter the dataword \n");
  for(i=0;i<17;i++)
  scanf("%d",&div[i]);
  for(i=i;i<33;i++)
     div[i]=0;
  for(i=0;i<17;i++) ze[i]=0;
  printf("Enter dividend \n");
  for(i=0;i<17;i++)
     scanf("%d",&dd[i]);
```

```
i=0;
k=0;
  for(i=i;i<17;i++)
     arr[k++]=div[i];
while(i<33)
{ if(arr[0]==0)
     xor(arr,ze);
   else
     xor(arr,dd);
  arr[16]=div[i++];
}
k=0;
for(i=17;i<33;i++)
div[i]=arr[k++];
printf("Codeword: ");
  for(i=0;i<33;i++)
  printf("%d",div[i]);
for(i=0;i<17;i++)
  arr[i]=0; printf("\nAt
receiver end \n");
k=0;
  for(i=i;i<17;i++)
     arr[k++]=div[i];
while(i<33)
{ if(arr[0]==0)
  xor(arr,ze);
  else
```

```
xor(arr,dd);
arr[16]=div[i++];
}
k=0;
for(i=17;i<33;i++)
div[i]=arr[k++];

printf("Codeword: ");
    for(i=0;i<33;i++)
        printf("%d",div[i]);
}</pre>
```

## **OUTPUT:**

```
☐ C:\Users\Admin\Desktop\1BM21CS047\ADA\CRC16\bin\Debug\CRC16.exe

Enter the dataword

1 0 1 1 0 0 1 1 1 1 0 0 1 0 1 1 1

Enter dividend

1 0 0 1 0 0 0 0 0 1 0 0 0 1 1

Codeword: 10110011110010111000000000011011

At receiver end

Codeword: 101100111100101110000000000000

Process returned 1 (0x1) execution time: 49.507 s

Press any key to continue.
```

## **OBSERVATION:**

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	using cre-cerit (16-bils)	
	(" and township (the ) all being there " I all	
	Java program	
	import jours entit scanner;	
	class mater to	
	scanner in = new scanner (system in);	
	system out puinten ("tate monage (data bits:");	
	string mussage = in-neutline ();	
	System out puntln ("Entir Generator:");	
	String quarator = in next line ();	
	int data [] = new int [ generation length ()]	
	Tot divisor 17 = new int " generalis, legger cs );	
	fun (int 1=0; ic memage length (); i++) {	
	fun (int i=0 : i c menage (engle (): i++) {  data [i]= Interger, pasce Int (menage, chanti(i)+"")	146
	3 tem manufactures as	
a	for (int 7=0; i equivalor, length (); i++) {	FF.
are I	division [1] = integer pareint (generator charAt (1) 1 " );	
	3	110
	for (int 120; i zmenage length(); i++) {	
	9 (deta (1) == 1)	
The last	for (it joo; jedivisor leyth: j+)	
6 64 00	data [i+j] = division [j] =	
	3	
	System out pointly ("The chekrum code in");	
	P. (21 1=0: 1 menage 1 1 1/4) 3	
	at 12-54 Et Common character (1)+"")	
	data (i) = Integer, pane Int (menge charAto(i)+""))	
	for ( (nt i=0) ix delet length, i++)	-
	System out pointly (data (1)); System out pointly (2)	-
	Sulton out pountly ())	1
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("Extr. chelsum code")
System out printly "Enter checkour code");
nurage = in next line ();
a Court purt ()
generator = in next line ()
for (int i=0; i< menage length (); (++)  data [i] = Integer, pone Int (menage charAt(i)+"")
data [i] : Integer, pome Int (meorage charAt(1)+
for (int i=0; i < generator length (); i++)
divisor [i] Integer- passeont (generator charAt(i) + ")
for (int j=0: / money length (); j++) {
for (int i=0; icmenage length (); i++) t  if (data [i)==1)
1264 500 100 100
for ( let j=0; ye diving length; j++)  data [i+j] = diving [j];
auta (1+)) = divisor (j))
hade wild (
boolean valid = true;
or line i=0; ix data length; i++) }
for (int i=0; i< data length; i++) {  if (data [i]==1) {  valid = lake:
break;
Con Const
3
1 (valid) system as 4
place & to printly ("Data stream is not 11")
Po al perial n ('Date stream is
else System out printle ("Data stream in invalid!"), in close (); return 0;
return 0',
3
The second secon

Output: Enter menage data bits: 1110000 Enter generator: 1001 The checkoum code in: 1110000 111) Enter checkerus code: 1110000111 Enter generator: 1001 Data stream is uslid Enter message | data bit : 1110000

Enter generator: 1001

The checksum code in: 1110000111 Enty chicksum code: 1110000110 11 emor Enter generator: 100)

Data stream in not valed! CRC error.