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

Code:

```c
#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]);
```

```c
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++];
```

```c
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++];
```
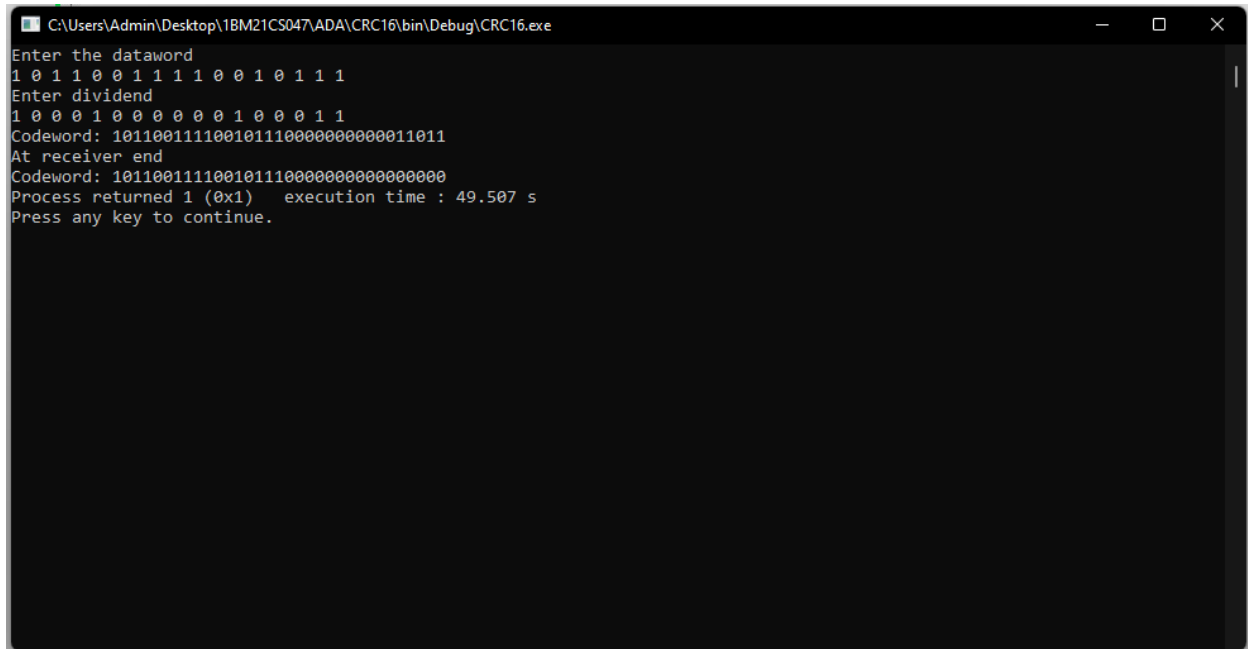
```
    printf("Codeword: ");

        for(i=0;i<33;i++)

            printf("%d",div[i]);

}
```

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 0 1 0 0 0 0 0 0 1 0 0 0 1 1
Codeword: 10110011110010111000000000011011
At receiver end
Codeword: 10110011110010111000000000000000
Process returned 1 (0x1)   execution time : 49.507 s
Press any key to continue.
```

Observation:

Lab – 13.

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

```
#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()f
int dd[17], div[33], ze[17], i, k ;
printf(" Enter 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[p++];
}
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("\n At 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++)
  b print f ("%o d4, div [i]);
y
```

Output:
Enter dataword
1 0 1 1 0 0 1 1 1 1 0 0 1 0 1 1 1
Enter dividend
1 0 0 0 1 0 0 0 0 0 1 0 0 0 1 1
Codeword: 1011001111001011100000000000011011
At receiver end.
Codeword: 1011001111001011 00000000000000000 .

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