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CYCLE-2

Experiment-1

Aim: To write program for error detecting code using CRC-CCITT (16-bits)

```
#include<stdio.h>
#include<string.h>
#define N strlen(poly)
char data[30];
char check_value[30];
char poly[0];
int data_length,i,j;
void XOR
{ for(j=1;j<N;j++)
checkvalue[j] = ((check_value[j]==poly[j])?'0':'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]!='1');i++)
if(N-1)
printf("\n Error detected\n");
else
printf("\n No error detected\n"); }
void crc()
{ for(i=0;i<N;i++)
checkvalue[i]=data[i];
do{
if(checkvalue[0]=='1')
XOR();
```

```
for(j=0;j<N-1;j++)
check_value[j]=check_value[j+1];
  check_value[j]=data[j+i];
 }while(i<=data_length+N+1);}
int main()
{printf("\n Enter data to be transmitted:");
 scanf("%s",data);
 printf("\n Enter the divisor polynomial:");
  scanf("%s",poly);
  data_length=strlen(data);
 for(i=data_length;i<data_length+16;i++)
  data[i]='0';
  printf("\n Data padded with n-1 zeroes:%s",
  data);
  crc();
printf("\n CRC value is %s",check_value);
for(i=data_length;i<data_length+16-N+1;i++)
  data[i]=check_value[i-data_length];
  printf("\n Final data word to be sent:%s\n"
      data);
   receiver();
   return 0;}
```

Output:

Enter the data to be transmitted :101100

Enter the divisor polynomial :1001

Data padded with n-1 zeroes :101100000

CRC value is :001

Final codeword to be sent :101100001

Enter the received data: 101100001

No error detected.

Enter the data to be transmitted :1010110

Enter the divisor polynomial :1011

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Data padded with n-1 zeroes : 10101000
CRC value is: 001
Final codeword to be sent : 10101001

10 Error in received data : 10001000
error detected.

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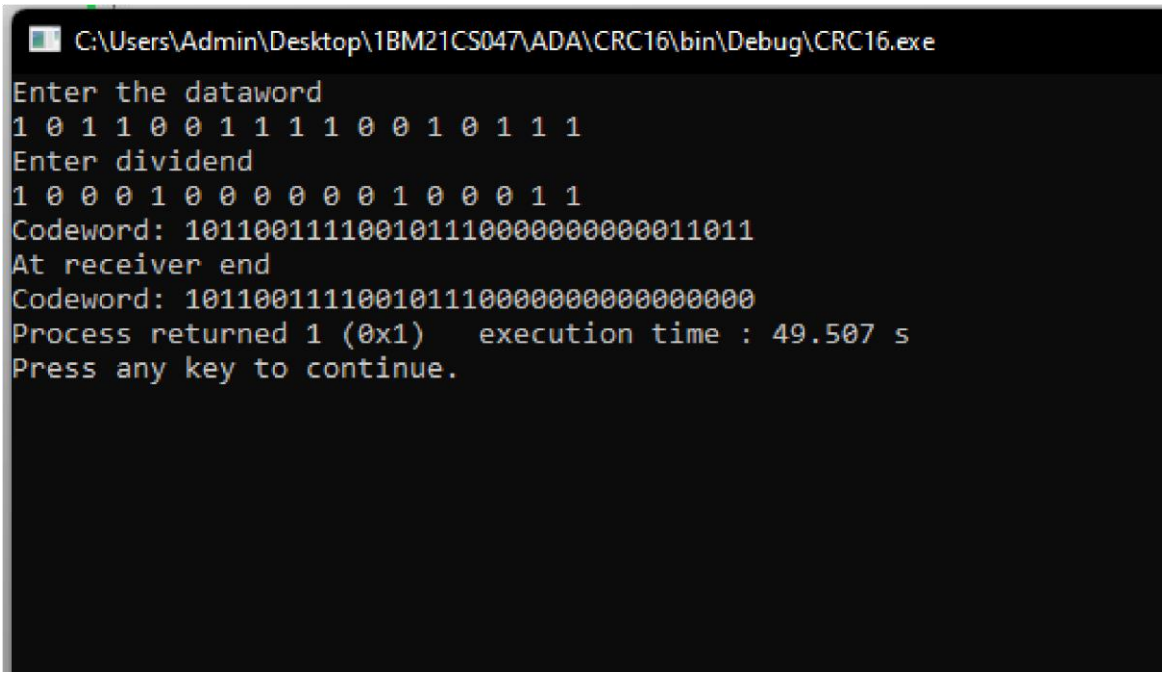
CODE:

```
#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]);
}
```


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.