LAB 13

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

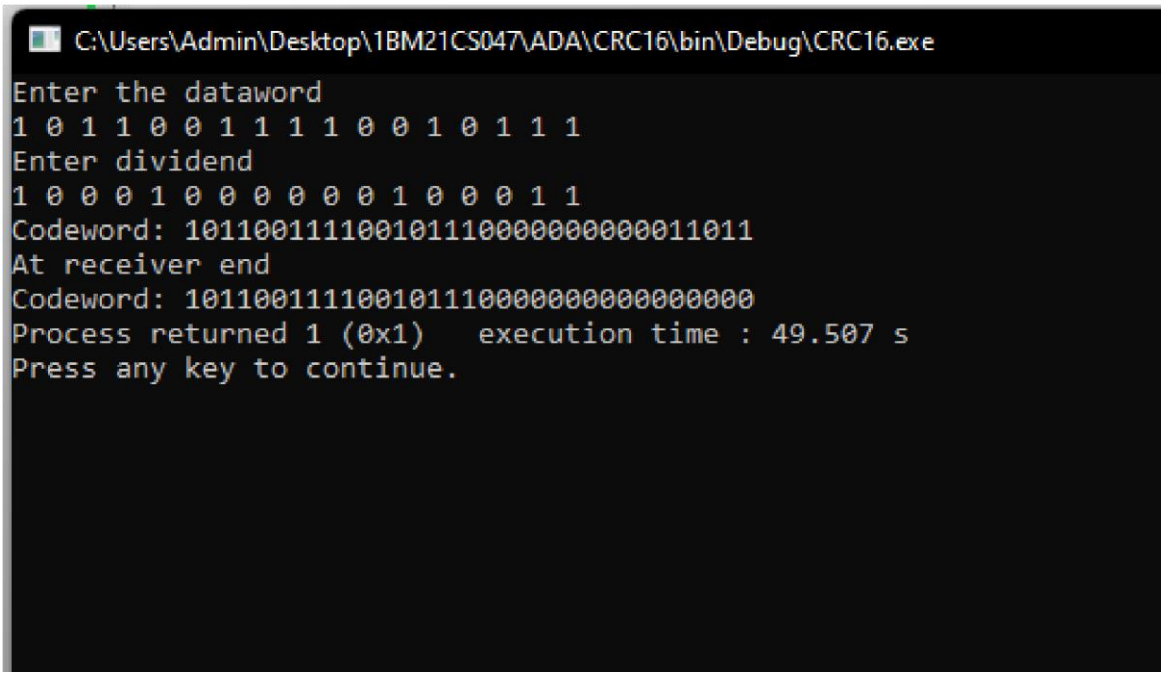
CODE:

```
#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]);
```

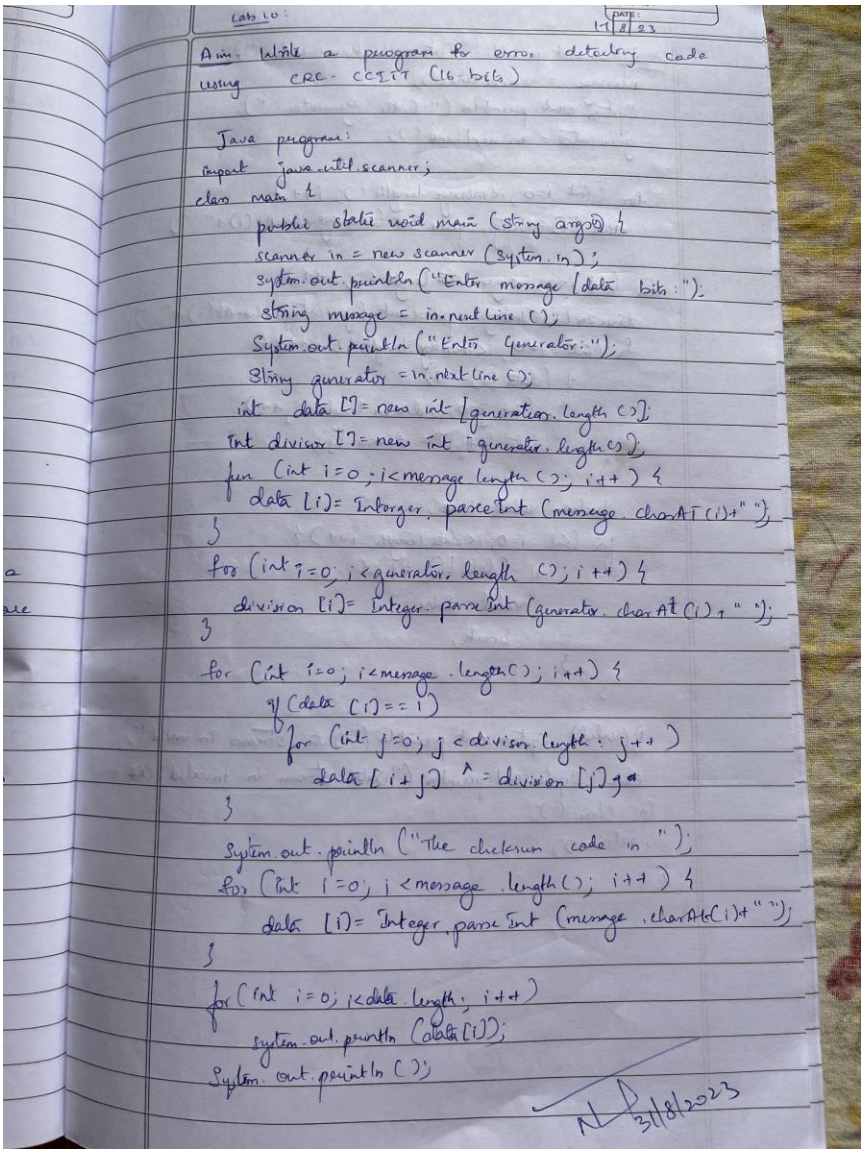
```
i=0;
k=0;
    for(i=i;i<17;i++)
        arr[k++]=div[i];
while(i<33)
{ if(arr[0]==0)
        xor(arr,ze);
    else
        xor(arr,dd);

    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]);
}
```

OUTPUT:



OBSERVATION:



Lab 10

DATE: 17/8/23

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

Java program:

```
import java.util.scanner;
class main {
    public static void main (String args[]) {
    scanner in = new scanner (System.in);
    system.out.println("Enter message [data bits:");
    String message = in.nextLine();
    System.out.println("Enter Generator:");
    String generator = in.nextLine();
    int data[] = new int [generation.length()];
    Int divisor[] = new int [generator.length()];
    fun (int i=0; i<message length(); i++) {
    data[i] = Interger.parseInt (message.charAT(i)+"");
}
for (int i=0; i<generator.length(); i++) {
    division[i] = Integer.parseInt (generator.charAt(i)+"");
}
for (int i=0; i<message.length(); i++) {
    if (data[i]==1)
        for (int j=0; j<division.length; j++)
            data[i+j] ^= division[j];
}
System.out.println("the checksum code is:");
for (int i=0; i<message.length(); i++) {
    data[i] = Integer.parseInt (message.charAt(i)+"");
}
for (int i=0; i<data.length; i++)
    system.out.println(data[i]);
System.out.println();
```

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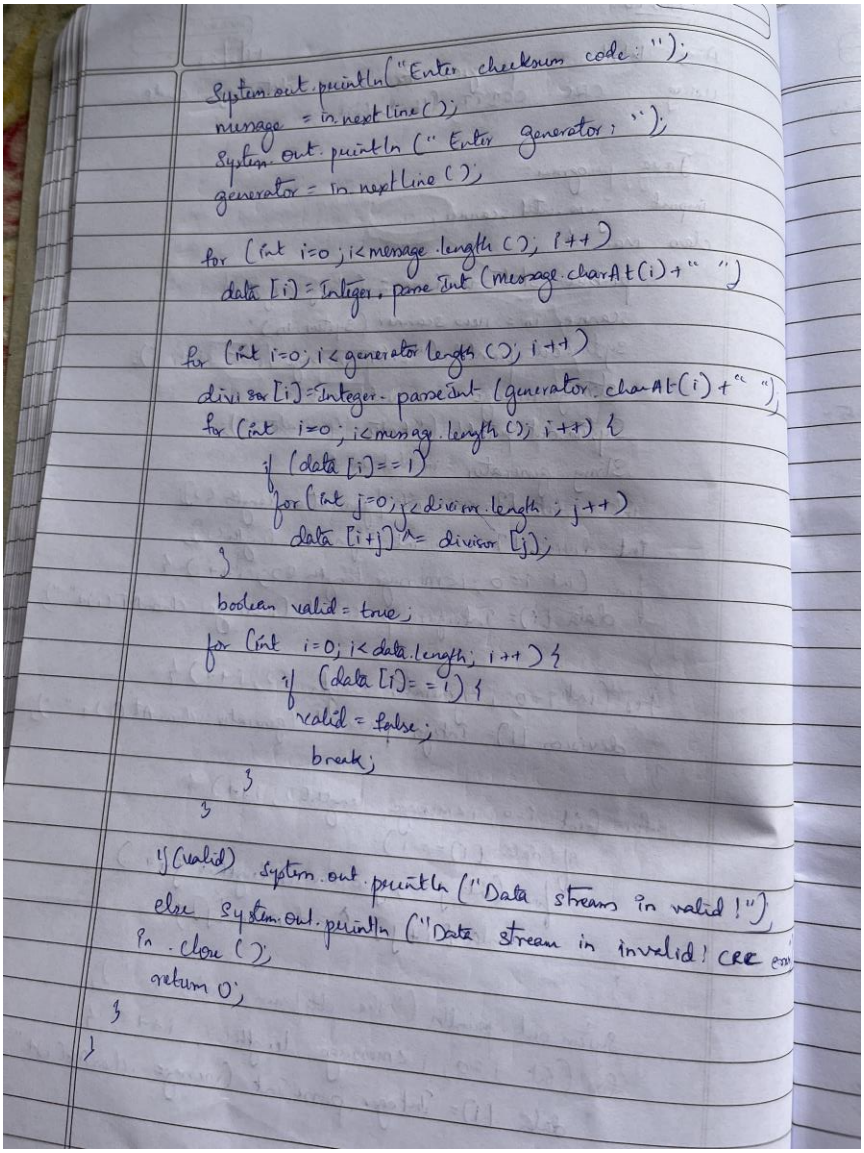

```
System.out.println("Enter checksum code: ");
message = in.nextLine();
System.out.println("Enter generator: ");
generator = in.nextLine();

for (int i=0; i<message.length(); i++)
 data[i] = Integer.parseInt(message.charAt(i)+"");

for (int i=0; i<generator.length(); i++)
divisor[i] = Integer.parseInt(generator.charAt(i)+"");
for (int i=0; i<message.length(); i++) {
    if (data[i]==1)
      for(int j=0; j<divisor.length; j++)
       data[i+j] ^= divisor[j];
}

boolean valid = true;
for (int i=0; i<data.length; i++) {
    if (data[i]==1) {
      valid = false;
       break;
    }
}

if(valid) System.out.println("Data stream is valid!");
else System.out.println("Data stream is invalid! CRC error");
in.close();
return 0;
}
}
```

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Output :

- Enter message/data bits: 1110000
  Enter generator: 1001
  The checksum code is: 1110000111
  Enter checksum code: 1110000111
  Enter generator: 1001
  Data stream is valid

- Enter message/data bits: 1110000
  Enter generator: 1001
  The checksum code is: 1110000111
  Enter checksum code: 1110000110 // error
  Enter generator: 1001
  Data stream is not valid! CRC error.

3/8/2023