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1BM17CS040

Cycle 2 Program 1

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

=>
```
#include <stdio.h>
char msg[50],rem[50],quo[50],temp[50];
void caltrans(int);
void crc(int);
void calrem();
void shift1();

int main()
{
  int n,i=0;
  char ch,flag=0;
  printf("Enter the Polynomial:");
  while((ch=getc(stdin))!='\n')
      msg[i++]=ch;
  n=i;
  for(i=0;i<16;i++)
      msg[n++]='0';
  msg[n]='\0';
  printf("Modified Polynomial %s",msg);
  for(i=0;i<=16;i++)
      gen[i]='0';
```

```
gen[0]=gen[4]=gen[11]=gen[16]='1';
gen[17]='\0';
printf("\nGenerator: %s",gen);
crc(n);
printf("\nQuotient: %s",quo);
printf("\nChecksum: %s",rem);
caltrans(n);
printf("\nfinal codeword: %s",msg);
printf("\nEnter transmitted frame: ");
scanf("\n%s",msg);
crc(n);
for(i=0;i<16;i++)
  if(rem[i]!='0')
    flag=1;
  else
    continue;
if(flag==1)
  printf("\nError Detected");
else
  printf("\nNo Error Detected");
}
```

```
void crc(int n)
{
  int i,j;
  for(i=0; i<n; i++)
    temp[i] = msg[i];
  for(i=0; i<16; i++)
     rem[i] = msg[i];
  for(i=0; i<n-16; i++)
  {
    if(rem[0]=='1')
    {
      quo[i] = '1';
      calrem();
    }
    else
    {
      quo[i] = '0';
      shift1();
    }
    rem[16] = msg[17+i];
    rem[17] = '\0';
    for(j=0; j<=17; j++)
       temp[j] = rem[j];
  }
  quo[n-16] = '\0';
}
```

```
void calrem()
{
  int i,j;
  for(i=1;i<=16;i++)
    rem[i-1]=((int)temp[i]-48)^
    ((int)gen[i]-48)+48;
}
void shift1()
{int i;
 for(i=1;i<=16;i++)
   rem[i-1]=rem[i];
}
void caltrans(int n)
{
  int i,k=0;
  for(i=n-16;i<n;i++)
    msg[i]=((int)msg[i]-48
      ^((int)rem[k++]-48)+48;
   msg[i]='\0';
}
```