CRC (16bit) error detecting

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```
# include <stdio.h>
  char m[50], g[50], r[50], q[50], tmp[50];
   void caltrans(int n)
  { int i, k=0;
    for(i=n-16 ; i<n; i++)
        m[i] = ((int) m[i]-48) ^ ((int) r[k++]-48) +48;
        m[i] = '\0';
    }

 void crc(int n)
  {   int i,j;
    for( i=0; i<n; i++)
       tmp[i]= m[i];
       for( i=0; i<16; i++)
         r[i] = m[i];
         printf ("\n intermediat remainder \n");
     for( i=0 ; i<n-16 ; i++)
    {     if (r[0] == '1')
          {   q[i] = '1';
               calram();
          }
         else
          {  q[i] ='0';
             shift();
         }
      r[16] = m[17+i];
  r[17] = '\0';
  prinf ("\n remainder %d : %.s ", i+1, r);
    for (j=0; j<17; j++)
        tmp [j] = r[j];
  }
  q[n-16] = '\0';
}

void calram()
 {
  int i,j;
 for (i=1; i<16; i++)
   r[i-1] = ((int) tmp[i]-48) ^ ((int) g[i]-48) + 48;
  }

void shift()
 {
   int i;
  for ( i=1; i<=16; i++)
        r[i-1] = r[i];
    }
```

```
int main()
 {
   int n,i=0;
   char ch, flag=0;
   printf("Enter the frame bits:");
    while((ch=getc(stdin))!='\n')
    m[i++]=ch;
     n=i;
   for(i=0; i<16; i++)
     m[n++]='0';
     m[n]='\0';
     printf("Message after appending 16zeros: %s", m);
   for(i=0; i<16; i++)
     g[i]='0';
   g[0]=g[4]=g[11]=g[16]='1'; g[17]='\0';
    printf("\n generator: %s \n", g);
     crc(n);
     printf("\n quotient: %s", q);
      caltrans(n);
      printf(" transmitted frame: %s", m);
      printf(" Enter transmitted frame:");
      scanf("\n %s", m);
        printf("CRC checking \n");
          crc(n);
          printf("\n last remainder %s", r);
      for(i=0; i<16; i++)
    { if (r[i]!='0')
        flag=1;
      else
      continue;
    }
  if(flag==1)
     printf ("Error during transmission");
   else
      printf ("Received frame is correct");
}
```