#include<stdio.h> #include<string.h>

#define N strlen(g)

//declare the header libraries char t[50], cs[50], g[50];

int a,e,c; void xor()

{

for(c=1;c<N;c++)

//

cs[c]=((cs[c]==g[c])?'0':'1');

//Checking the XOR operation. If both operands are same, then output will b "0" otherwise its "1".

}

void crc()

{

for(e=0;e<N;e++)

//Consider only first FIVE bits from the modified data cs[e]=t[e];

//Copy those first FIVE bits to CHECKSUM cs[e] from t[e]

do{

if(cs[0]=='1')

//If first leftmost bit is 1 then perform XOR operation xor();

//Calling XOR function for(c=0;c<N-1;c++)

//Performing XOR operation at the first iteration for FIVE bits (0 to N-1) cs[c]=cs[c+1];

//Peform the same for all the data by right shift by 1

cs[c]=t[e++];

} while(e<=a+N-1);

//Continue the operation for the entire data.

}

int main(){

printf("\n Enter the data: ");

//Enter the data as 1101011011 scanf("%s", t);

// Data stored in a string t

printf("\n Enter the generator polynomial: "); scanf("%s", g);

//Enter the generator polynomial: Since we have hard coded the GP as 10011 a=strlen(t);

// "a" defines the total length of the data for(e=a;e<a+N-1;e++)

//Appending N-1 zeros to the data where N is the length of the GP t[e]='0';

//t[e] defines appending zeros from e=a;e<a+N-1;e++ printf("\n Modified data is: %s", t);

//MOdified data is 11010110110000 crc();

//Call CRC function

printf("\n Checksum is: %s", cs);

//Print the checksum after XOR operation for(e=a;e<a+N-1;e++)

//To append the checksum value instead of N-1 zeros in total length of the data t[e]=cs[e-a];

//The remodified data with checksum (FINAL CODEWORD) printf("\n The final codeword is: %s", t);

//Print the final codeword

printf("\n Test error detection: 0 for YES and 1 for NO: ");

//To check for error detection scanf("%d", &e);

if(e==0)

//If the value of "e" is 0

{

do {

printf("\n Enter the position where error is to be inserted: ");

//Specify the position scanf("%d", &e);

//Say for example, e=6

} while(e==0||e>a+N-1);

//WHILE states the boundary, means ranging for 0 to a+N-1

t[e-1] = (t[e-1]=='0')?'1':'0';

//Changing the bit from 0 to 1 and vice versa for error detection printf("\n Erroneous data: %s\n",t);

}

crc();

for(e=0; (e<N-1)&&(cs[e]!='1'); e++);

//If CHECKSUM is not equal to 1 then error is detected else no error if(e<N-1)

printf("\n Error detected \n \n");

else

printf("\n No error detected \n \n");

return 0;

}