#include<stdio.h>

#include<string.h>

#include<conio.h>

#define N strlen(g)

char t[128], cs[128], g[]="10001000000100001";

int a, e, c;

void xor() {

for(c=1;c<N;c++) cs[c]=((cs[c]==g[c])?'0':'1');

}

void crc() {

for(e=0;e<N;e++) cs[e]=t[e];

do {

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

for(c=0;c<N-1;c++) cs[c]=cs[c+1];

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

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

}

void main() {

clrscr();

printf("\nEnter poly : "); scanf("%s",t);

printf("\nGenerating Polynomial is : %s",g);

a=strlen(t);

for(e=a;e<a+N-1;e++) t[e]='0';

printf("\nModified t[u] is : %s",t);

crc();

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

for(e=a;e<a+N-1;e++) t[e]=cs[e-a];

printf("\nFinal Codeword is : %s",t);

printf("\nTest Error detection 0(yes) 1(no) ? : ");

scanf("%d",&e);

if(e==0) {

printf("Enter position where error is to inserted : ");

scanf("%d",&e);

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

printf("Errorneous data : %s\n",t);

}

crc();

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

if(e<N-1) printf("Error detected.");

else printf("No Error Detected.");

getch();

}