# Cyclic redundancy check implementation using C:

Program:

#include<stdio.h>

#include<string.h>

#define N strlen(g)

char t[28],cs[28],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);

}

int main()

{

    printf("\nEnter data : ");

    scanf("%s",t);

    printf("\n----------------------------------------");

    printf("\nGeneratng polynomial : %s",g);

    a=strlen(t);

    for(e=a;e<a+N-1;e++)

        t[e]='0';

    printf("\n----------------------------------------");

    printf("\nModified data is : %s",t);

    printf("\n----------------------------------------");

    crc();

    printf("\nChecksum is : %s",cs);

    for(e=a;e<a+N-1;e++)

        t[e]=cs[e-a];

    printf("\n----------------------------------------");

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

    printf("\n----------------------------------------");

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

    scanf("%d",&e);

    if(e==0)

    {

        do{

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

            scanf("%d",&e);

        }while(e==0 || e>a+N-1);

        t[e-1]=(t[e-1]=='0')?'1':'0';

        printf("----------------------------------------");

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

    }

    crc();

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

        if(e<N-1)

            printf("\nError detected\n");

        else

            printf("\nNo error detected\n\n")

   return 0;

}

Output:

Enter data : 1101  
  
----------------------------------------  
Generatng polynomial : 10001000000100001  
----------------------------------------  
Modified data is : 11010000000000000000  
----------------------------------------  
Checksum is : 1101000110101101  
----------------------------------------  
Final codeword is : 11011101000110101101  
----------------------------------------  
Test error detection 0(yes) 1(no)? : 0  
  
Enter the position where error is to be inserted : 2  
----------------------------------------  
Erroneous data : 10011101000110101101  
Error detected