Design and implement CRC error detection method used

in data link layer.

#include<iostream>

using namespace std;

int main() {

int data[10];

int dataatrec[10],c,c1,c2,c3,i;

cout<<"Enter 4 bits of data one by one\n";

cin>>data[0];

cin>>data[1];

cin>>data[2];

cin>>data[4];

//Calculation of even parity

data[6]=data[0]^data[2]^data[4];

data[5]=data[0]^data[1]^data[4];

data[3]=data[0]^data[1]^data[2];

cout<<"\nEncoded data is\n";

for(i=0;i<7;i++)

cout<<data[i];

cout<<"\n\nEnter received data bits one by one\n";

for(i=0;i<7;i++)

cin>>dataatrec[i];

c1=dataatrec[6]^dataatrec[4]^dataatrec[2]^dataatrec[0];

c2=dataatrec[5]^dataatrec[4]^dataatrec[1]^dataatrec[0];

c3=dataatrec[3]^dataatrec[2]^dataatrec[1]^dataatrec[0];

c=c3\*4+c2\*2+c1 ;

if(c==0) {

cout<<"\nNo error while transmission of data\n";

}

else {

cout<<"\nError on position "<<c;

cout<<"\nData sent : ";

for(i=0;i<7;i++)

cout<<data[i];

cout<<"\nData received : ";

for(i=0;i<7;i++)

cout<<dataatrec[i];

cout<<"\nCorrect message is\n";

//if errorneous bit is 0 we complement it else vice versa

if(dataatrec[7-c]==0)

dataatrec[7-c]=1;

else

dataatrec[7-c]=0;

for (i=0;i<7;i++) {

cout<<dataatrec[i];

}

}

return 0;

}

OUTPUT

Text

Description automatically generated