**Program for Error detection and correction(Hamming code)**

#include<stdio.h>

void main() {

    int d[10];

    int datarec[10],p,p1,p2,p3,i;

    printf("Enter 4 bits of d one by one\n"); //entering the dataword

    scanf("%d",&d[3]);

    scanf("%d",&d[5]);

    scanf("%d",&d[6]);

    scanf("%d",&d[7]);

    //Calculation of parity bits at sender

     d[1]=d[3]^d[5]^d[7];

d[2]=d[3]^d[6]^d[7];

d[4]=d[5]^d[6]^d[7];

printf("\nEncoded Codeword is is\n");

for(i=1;i<8;i++)

        printf("%d",d[i]);

    printf("\n\nEnter received codeword bits one by one\n");

    for(i=1;i<8;i++)

        scanf("%d",&datarec[i]); // the codeword obtained at the receiver

    p1=datarec[1]^datarec[3]^datarec[5]^datarec[7];

p2=datarec[2]^datarec[3]^datarec[6]^datarec[7];

p3=datarec[4]^datarec[5]^datarec[6]^datarec[7];

p=p1\*1 +p2\*2+p3\*4 ; //find the decimal value(index value of error)

    if(p==0) {

printf("\nNo error while transmission of d\n");

    }

else {

printf("\nError on position %d",p);

printf("\nData sent : ");

        for(i=1;i<8;i++)

         printf("%d",d[i]);

printf("\nData received : ");

        for(i=1;i<8;i++)

         printf("%d",datarec[i]);

printf("\nCorrect message is\n");

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

if(datarec[p]==0)

datarec[p]=1;

        else

datarec[p]=0;

for (i=1;i<8;i++) {

printf("%d",datarec[i]);

}

}

}