**HAMMING CODE PROGRAM**

#include <stdlib.h>

#include<stdio.h>

int main()

{

int a[4],b[4],r[3],s[3],i,q[3],c[7];

printf("\nenter 4 bit data word:\n");

for(i=3;i>=0;i--)

{

scanf("%d",&a[i]);

}

r[0]=(a[3]+a[1]+a[0])%2;

r[1]=(a[0]+a[2]+a[3])%2;

r[2]=(a[1]+a[2]+a[3])%2;

printf("\n\nthe 7bit hamming code word: \n");

for(i=3;i>=0;i--)

{

printf("%d\t",a[i]);

}

for(i=2;i>=0;i--)

{

printf("%d\t",r[i]);

}

printf("\n");

printf("\nenter the 7bit recieved codeword: ");

for(i=7;i>0;i--)

scanf ("%d",&c[i]);

b[3]=c[7];b[2]=c[6];b[1]=c[5];b[0]=c[4];

r[2]=c[3];r[1]=c[2];r[0]=c[1];

//calculating syndrome bits

s[0]=(b[0]+b[1]+b[3]+r[0])%2;

s[1]=(b[0]+b[2]+b[3]+r[1])%2;

s[2]=(b[1]+b[2]+b[3]+r[2])%2;

printf("\nsyndrome is: \n");

for(i=2;i>=0;i--)

{

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

}

if((s[2]==0) && (s[1]==0) && (s[0]==0))

printf("\n RECIEVED WORD IS ERROR FREE\n");

if((s[2]==1)&&(s[1]==1)&&(s[0]==1))

{

printf("\nError in received codeword, position- 7th bit from right\n");

if(c[7]==0)

c[7]=1;

else

c[7]=0;

printf("\n Corrected codeword is\n");

for(i=7;i>0;i--)

printf("%d \t", c[i]);

}

if((s[2]==1)&&(s[1]==1)&&(s[0]==0))

{

printf("\nError in received codeword, Position- 6th bit from right\n");

if(c[6]==0)

c[6]=1;

else

c[6]=0;

printf("\n Corrected codeword is\n");

for(i=7;i>0;i--)

printf("%d \t", c[i]);

}

if((s[2]==1)&&(s[1]==0)&&(s[0]==1))

{

printf("\nError in received codeword, Position- 5th bit from right\n");

if(c[5]==0)

c[5]=1;

else

c[5]=0;

printf("\n Corrected codeword is\n");

for(i=7;i>0;i--)

printf("%d \t", c[i]);

}

if((s[2]==1)&&(s[1]==0)&&(s[0]==0))

{

printf("\nError in received codeword, Position- 4th bit from right\n");

if(c[4]==0)

c[4]=1;

else

c[4]=0;

printf("\n Corrected codeword is\n");

for(i=7;i>0;i--)

printf("%d \t", c[i]);

}

if((s[2]==0)&&(s[1]==1)&&(s[0]==1))

{

printf("\nError in received codeword, Position- 3rd bit from right\n");

if(c[3]==0)

c[3]=1;

else

c[3]=0;

printf("\n Corrected codeword is\n");

for(i=7;i>0;i--)

printf("%d \t", c[i]);

}

if((s[2]==0)&&(s[1]==1)&&(s[0]==0))

{

printf("\nError in received codeword, Position- 2nd bit from right\n");

if(c[2]==0)

c[2]=1;

else

c[2]=0;

printf("\n Corrected codeword is\n");

for(i=7;i>0;i--)

printf("%d \t", c[i]);

}

if((s[2]==0)&&(s[1]==0)&&(s[0]==1))

{

printf("\nError in received codeword, Position- 1st bit from right\n");

if(c[1]==0)

c[1] =1;

else

c[1]=0;

printf("\n Corrected codeword is\n");

for(i=7;i>0;i--)

printf("%d \t", c[i]);

}

return(1);

}//End of Hamming code program

**OUTPUT**

