LBC MATLAB CODE

clc;

clear all;

close all;

g=[1 1 0 1 0 0 0;0 1 1 0 1 0 0;1 1 1 0 0 1 0;1 0 1 0 0 0 1];

disp(g);

disp('The order of linear block code for given generator matrix is ');

[n,k]=size(transpose(g));

disp('The cord word length is');

disp(n);

disp('The size of message bits are');

disp(k);

for i=1:2^k

for j=k:-1:1

if rem(i-1,2^(-j+k+1))>=2^(-j+k)

m(i,j)=1;

else

m(i,j)=0;

end

end

end

disp('The possible message bits are');

disp('c0 c1 c2 c3');

disp (m);

disp('The possible codewords are ');

disp('b0 b1 b2 c0 c1 c2 c3 Hamming weight');%%

c=rem(m\*g,2);

d\_min=sum((c(1:2^k,:))');

d\_min2=d\_min';

s=[c d\_min2];

disp(s);

disp('The minimum hamming weightfor the given block code is=');

d\_min1=min(sum((c(2:2^k,:))'));

disp(d\_min1);

%%DECODING PART

n=input('Enter the Size of codeword N=');

k=input('Enter the K=');

P=zeros(k,(n-k));

P=input('Enter the Parity Matrix having size of p=');

d=input('Enter the message ')

I=eye(k);

% generator matrix

G=[I P];

C=d\*G;

for i=1:n

if (rem(C(i),2)==0)

C(i)=0;

else

C(i)=1;

end

end

%starting for the decoder

p=P';

I=eye(n-k);

H=[p I];

H1=H';

disp('The H matrix is');

disp(H1);

R=input('Enter the Received Code Word');

disp(R);

%for syndrome

S=rem(R\*H1,2);

disp('Syndrom of a Given codeword is');

disp(S);

for i=1:size(H1)

if(H1(i,1:3)==S)

R(i)=1-R(i);

break;

end

end

disp('The Error is in bit:');

disp(i);

disp('correct receive code is given by');

disp(R);