```
clc;
clear all;
m=[1 0 1 1];
k=length(m);
n=7;
x=poly(0,"x")
m_x=(m(1)*(x^3))+(m(2)*(x^2))+(m(3)*(x))+(m(4)*1);
disp("Coefficients of message polynomial is",m_x);
g_x=(x^3)+x+1;
disp("Coefficients of generator polynomial is",g_x);
w_x=(x^(n-k))*m_x;
disp("product of word polynomial and generator polynomial is",w_x);
[r_x,q]=pdiv(w_x,g_x);
disp("remainder",r_x);
c_x=w_x+r_x;
disp("code word polynomial is",c_x);
a=coeff(c_x)
C=modulo(a,2);
disp("code word is",C);
p=coeff(r_x);
disp("remainder in polynomial form",p);
E=[1 0 0 0 0 0 0]
E_x= (E(1)*(x^6))+ (E(2)*(x^5))+ (E(3)*(x^4))+ (E(4)*(x^3))+ (E(5)*(x^2))+ (E(6)*(x^1))+ (E(7)*1);
disp("coefficients of error polynomial is",E_x);
R_x=c_x+E_x;
disp("coefficients of recieved polynomial is",R_x);
[r1,q1]=pdiv(R_x,g_x);
S1=coeff(r1);
S1=modulo(S1,2);
disp("remainder r1 in polynomial form",r1);
disp("Syndrome s1 bits for error codeword are:",S1);
[r2,q2]=pdiv(E_x,g_x);
S2=coeff(r2);
S2=modulo(S2,2);
disp("remainder r2 in polynomial form",r2);
disp("Syndrome s2 bits for error codeword are:",S2);
I=eye(n-k,n-k);
p=[1 1 0;0 0 1;1 0 1;1 1 1]
H=[p' I]
HT=H';
if(S1==0)
   disp("correct code word");
else
   disp("recieved code word is with error");
end
b=R_x-E_x;
d=coeff(b)
CC=modulo(d,2);
disp("correct codeword is",CC);
```

"Coefficients of message polynomial is"

1 +x +x³

"Coefficients of generator polynomial is"

1 +x +x³

"product of word polynomial and generator polynomial is"

$x^3 +x^4 +x^6$

"remainder"

0.

"code word polynomial is"

$x^3 +x^4 +x^6$

"code word is"

0. 0. 0. 1. 1. 0. 1.

"remainder in polynomial form"

0.

"coefficients of error polynomial is"

x^6

"coefficients of recieved polynomial is"

$x^3 +x^4 +2x^6$

"remainder r1 in polynomial form"

$1 +2x +x^2$

"Syndrome s1 bits for error codeword are:"

1. 0. 1.

"remainder r2 in polynomial form"

$1 +2x +x^2$

"Syndrome s2 bits for error codeword are:"

1. 0. 1.

"recieved code word is with error"

"corrected codeword is"

0. 0. 0. 1. 1. 0. 1.