**Task1**

step = 0.01;

t = 0:step:2;

x = ones(size(t));

t1 = 0:step:1;

t2 = 1+step:step:2;

h1 = 1-t1;

h2 = zeros(size(t2));

h = [h1 h2];

y = conv(x,h)\*step;

ty = 0:step:4;

plot(ty,y);

**Task2**

hh = deconv(y,x)\*(1/step);

plot(t,hh)

ylim([-.1 1.1]);

**Task4**

nx=0:4;

x = ones (size(nx));

nh= -5:5;

h=nh;

y=conv(x,h);

stem(-5:9,y)

axis([-10 40 -16 -16])

legend('y[n]')

grid on

**Task3**

t1 = [-1:0.01:0.5];

x1 = 0.6\*ones(size(t1));

t2 = [0.5+0.01:0.01:3];

x2 = 0.3\*ones(size(t2));

t3 = [3.01:0.01:10];

x3 = zeros(size(t3));

x = [x1 x2 x3];

t1 = -1:0.01:-.01;

t2 = 0:0.01:10;

h1 = zeros(size(t1));

h2 = exp(-t2);

h = [h1 h2];

y = conv(x,h)\*0.01;

plot(-2:.01:20,y)

**TASK5**

function [y, n] = convm(x, n1, h, n2)

a = n1(1) + n2(1);

b = n1(end) + n2(end);

n = a:b;

y = zeros(1, length(n));

for i = 1:length(x)

for j = 1:length(h)

y(i+j-1)=y(i+j-1)+x(i)\*h(j);

end

end

end

n = -2:2

x = n.^2

n2 = -1:3;

y = 1./n2+2;

[y,n] = convm(x,n,y,n2)

n1 = -2:2;

x = n1.^2;

n2 = -1:3;

h = 1./n2 + 2;

[y, n] = convm(x, n1, h, n2);

delta = (n1 == 0);

[h\_imp, n\_h] = convm(delta, n1, h, n2);

[y\_verify, n\_verify] = convm(x, n1, h\_imp, n\_h);

subplot(3,1,1);

stem(n, y, 'r', 'filled');

title('System Response y(n)');

xlabel('n'); ylabel('y(n)');

subplot(3,1,2);

stem(n\_h, h\_imp, 'b', 'filled');

title('Impulse Response h(n)');

xlabel('n'); ylabel('h(n)');

subplot(3,1,3);

stem(n\_verify, y\_verify, 'g', 'filled');

title('Verification: x(n) \* h(n)');

xlabel('n'); ylabel('y\_{verified}(n)');