% DT Convolution Example 2 (chap2_DT_convolution2.m)
% Compute y[n]=x[n]*v[n] where
% x[n]=u[n]-u[n-3]=p3[n-1]; rectangular pulse 3 steps long
% v[n]=r[n]u[n]-r[n]u[n-4]; first 4 steps of a ramp function
%
Q = 0; %starting index for x[n]
P = 1; %starting index for v[n]
x=[1,1,1]; % Define input vector x[n]
v=[1,2,3]; % Define input vector v[n]
xn = Q:1:(Q+length(x)-1); % Compute indices for x[n]
v = P:1:(P+length(v)-1); % Compute indices for v[n]

Q = 0; %starting index for x[n]
P = 1; %starting index for v[n]
x=[1,1,1]; % Define input vector x[n]
v=[1,2,3]; % Define input vector v[n]
xn = Q:1:(Q+length(x)-1); % Compute indices for x[n]
v = P:1:(P+length(v)-1); % Compute indices for v[n]

% plot input x[n]
stem(nx,x,'r.'),axis([-1 7 0 7]),grid,
ylabel('x[n]','fontsize',14,'fontname','times'),
xlabel('n','fontsize',14,'fontname','times'),

% plot input v[n]
figure
stem(nv,v,'r.'),axis([-1 7 0 7]),grid,
ylabel('v[n]','fontsize',14,'fontname','times'),
xlabel('n','fontsize',14,'fontname','times'),

% Compute the output y[n] using conv.m and plot
y=conv(x,v);
n=(P+Q):1:(P+Q+length(y)-1); % Compute indices for y[n]

% plot input y[n]
figure
stem(n,y,'r.'),axis([-1 7 0 7]),grid,
ylabel('y[n] = x[n] * v[n]','fontsize',14,'fontname','times'),
xlabel('n','fontsize',14,'fontname','times'),
title('Convolution Example','fontsize',16,'fontname','times'),
set(findobj('type','line'),'linewidth',1.5)
set(findobj('type','line'),'markersize',18)
set(findobj('type','axes'),'linewidth',2)
\[ x[n] \star v[n] \]
Convolution Example

\[ y[n] = x[n] * v[n] \]