

## Code

### L1.1:

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%% L1.1 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%      Figure 2.1.1      %%%
figure;
x = [0.9, -0.8, 0.7, 1.5, 2, 1.7, 1.0, 0.7, -0.8, 1.2];
nx = -4:5;
stem(nx, x, 'filled');
title('Figure 2.1.1');
xlabel('n');
ylabel('x[n]');
%%%      Figure 2.1.2      %%%
figure;
x = [0,0,1,0,0,0,0];
stem(x, 'filled');
title('Figure 2.1.2');
xlabel('n');
ylabel('x[n]');
%%%      Figure 2.1.3      %%%
figure;
x = [0,0,0,1,1,1,1,1,1,1,1];
nx = -3:7;
stem(nx, x, 'filled');
title('Figure 2.1.3');
xlabel('n');
ylabel('x[n]');
%%%      Figure 2.1.4      %%%
figure;
nx = 0:10;
x = nx;
stem(nx, x, 'filled');
title('Figure 2.1.4');
xlabel('n');
ylabel('x[n]');
%%%      Figure 2.1.5      %%%
figure;
n = 0:10;
e = 2;
x = e.^n;
stem(n, x, 'filled');
title('Figure 2.1.5');
xlabel('n');
ylabel('x[n]');
```

## L1.2:

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%% P2.17 Part a) %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x = [1, 1, 1, 1, 0]; h = [6, 5, 4, 3, 2, 1, 0];
y = conv(x, h);
% range for n
n = 0:length(y)-1;
% plot
stem(n, y, "filled");
%Plot titles
xlabel('n');
ylabel('y[n]');
title('L1.2 Part (a) - Convolution of x[n] and h[n]');
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%% P2.17 Part b) %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x = [0, 0, 0, 0, 0, 1, 1, 1, 1, 0, 0]; nx = [-2:8];
h = [0, 1, 1, 0, 0, 0, 0]; nh = [-5:1];
[y, ny] = conv_m(x, nx, h, nh);
% display
disp('y[n] = ');
disp(y);
disp('n :');
disp(ny);
% plot
stem(ny, y, 'filled');
xlabel('n');
ylabel('y[n]');
title('L1.2 Part (c) - Convolution of x[n] and h[n]');
```

## L1.3:

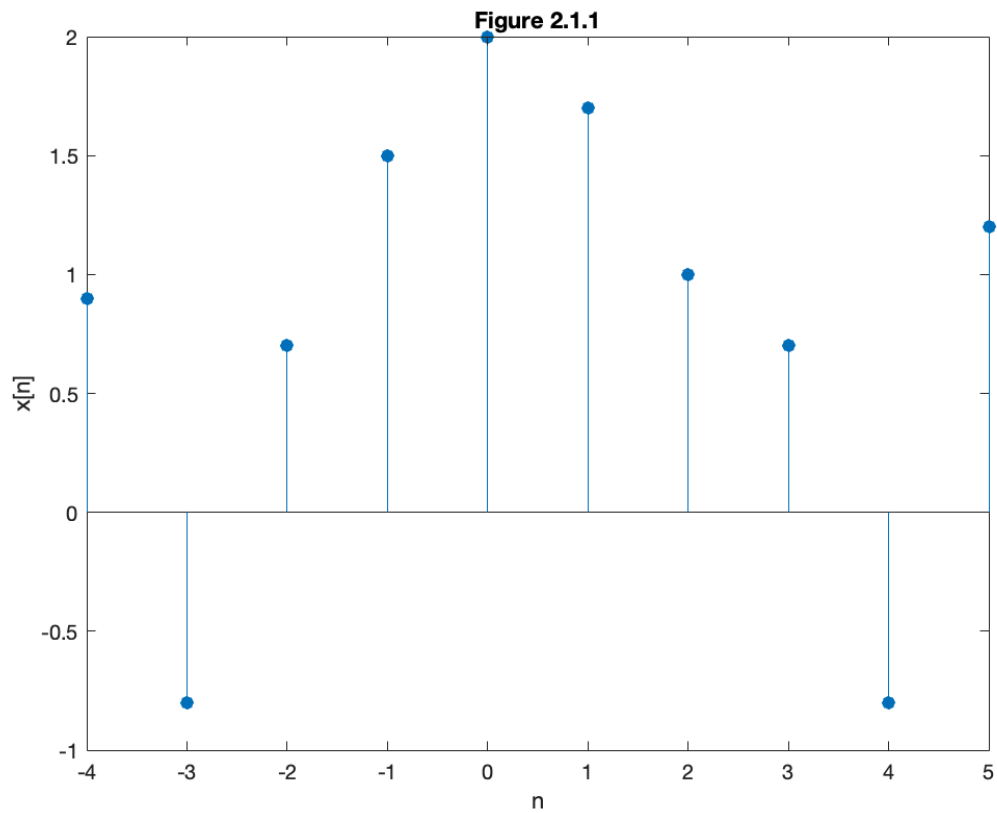
```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%% P2.18 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x = [0, 1/3, 2/3, 1, 4/3, 5/3, 2]; nx = [0:6];
h = [0, 1, 1, 1, 1, 1, 0]; nh = [-3:3];
[y, ny] = conv_m(x, nx, h, nh);
% display
disp('y[n] = ');
disp(y);
disp('n :');
disp(ny);
% plot
stem(ny, y, 'filled');
xlabel('n');
ylabel('y[n]');
title('L1.2 Part (c) - Convolution of x[n] and h[n]');
```

### Conv\_m function from Textbook:

```
function [y,ny] = conv_m(x,nx,h,nh)
% Modified convolution routine for signal processing
% -----
% [y,ny] = conv_m(x,nx,h,nh)
% [y,ny] = convolution result
% [x,nx] = first signal
% [h,nh] = second signal
%
nyb = nx(1)+nh(1); nye = nx(length(x)) + nh(length(h));
ny = [nyb:nye]; y = conv(x,h);
end
```

### Plots:

#### L1.1 -



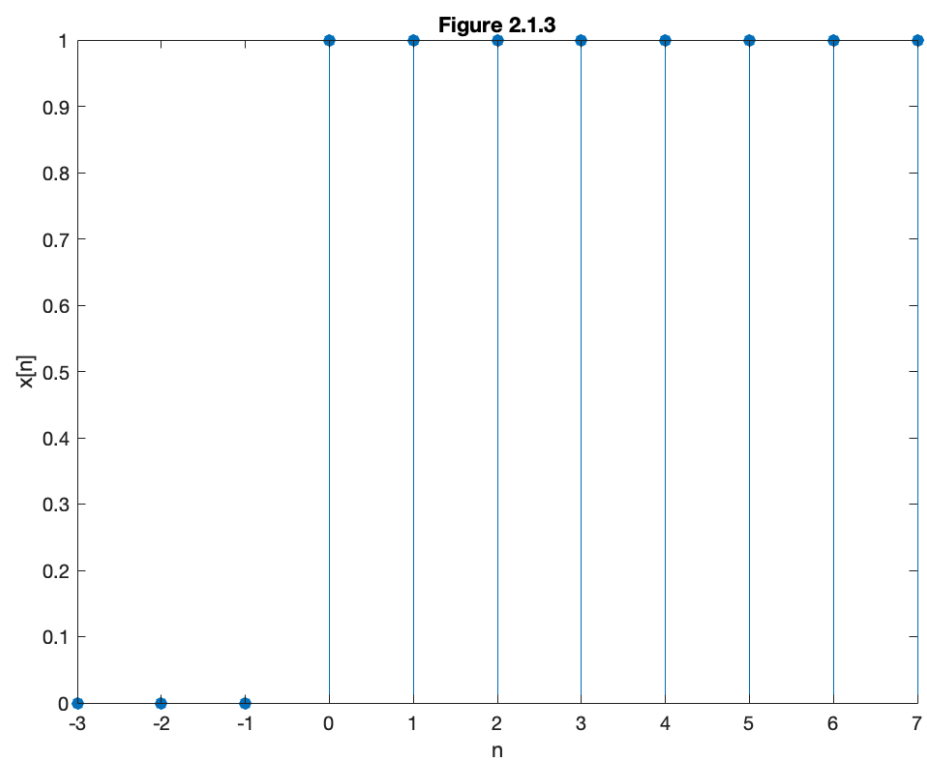
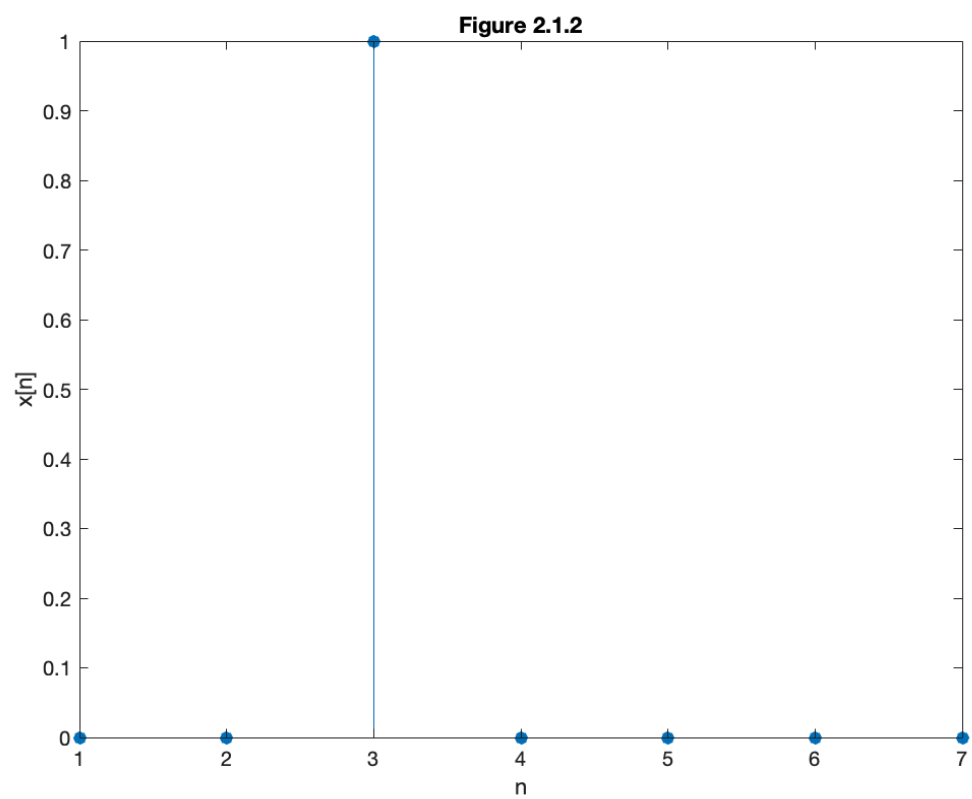


Figure 2.1.4

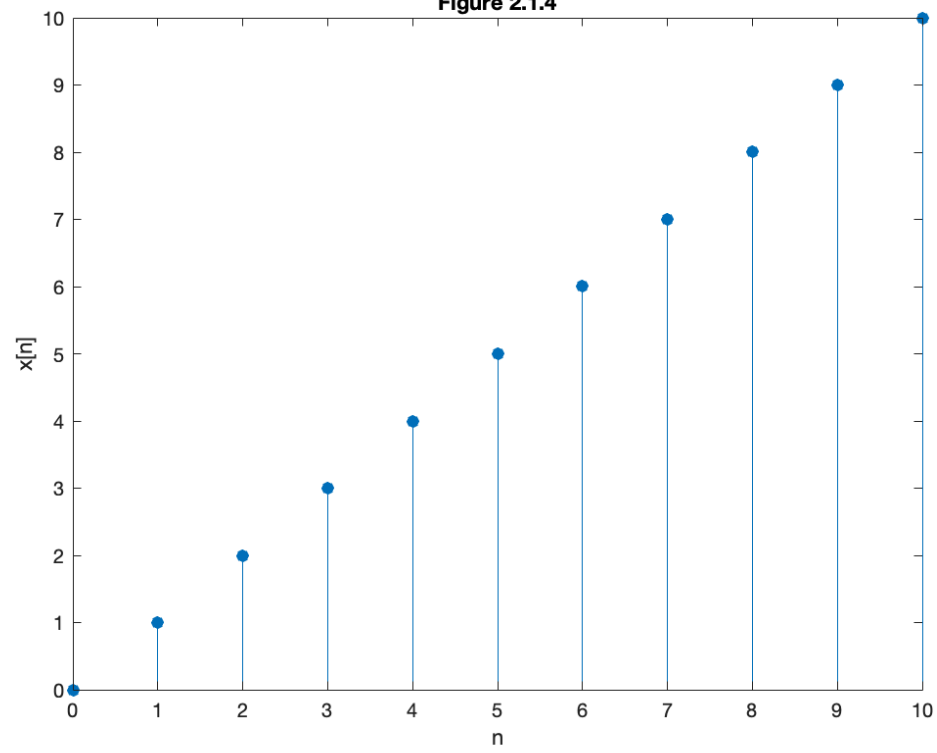
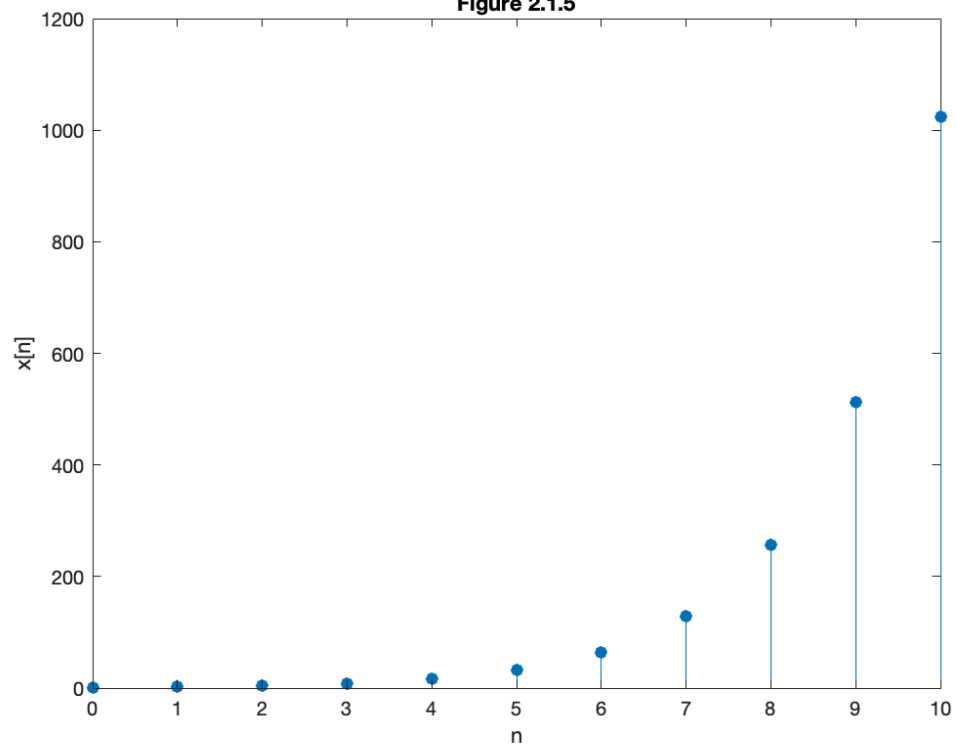
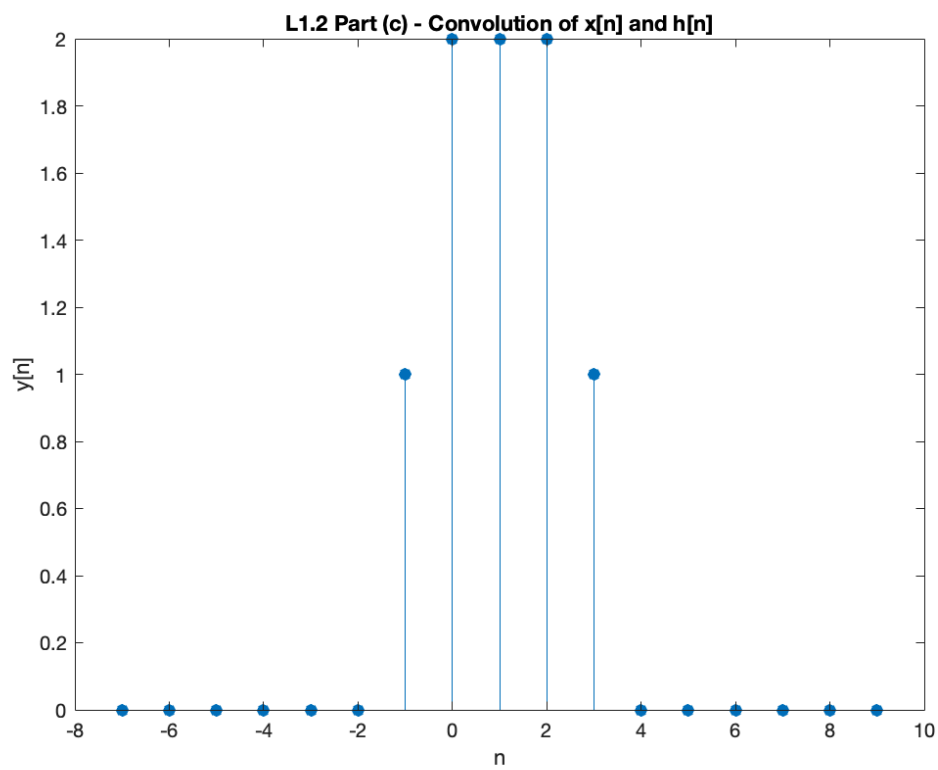
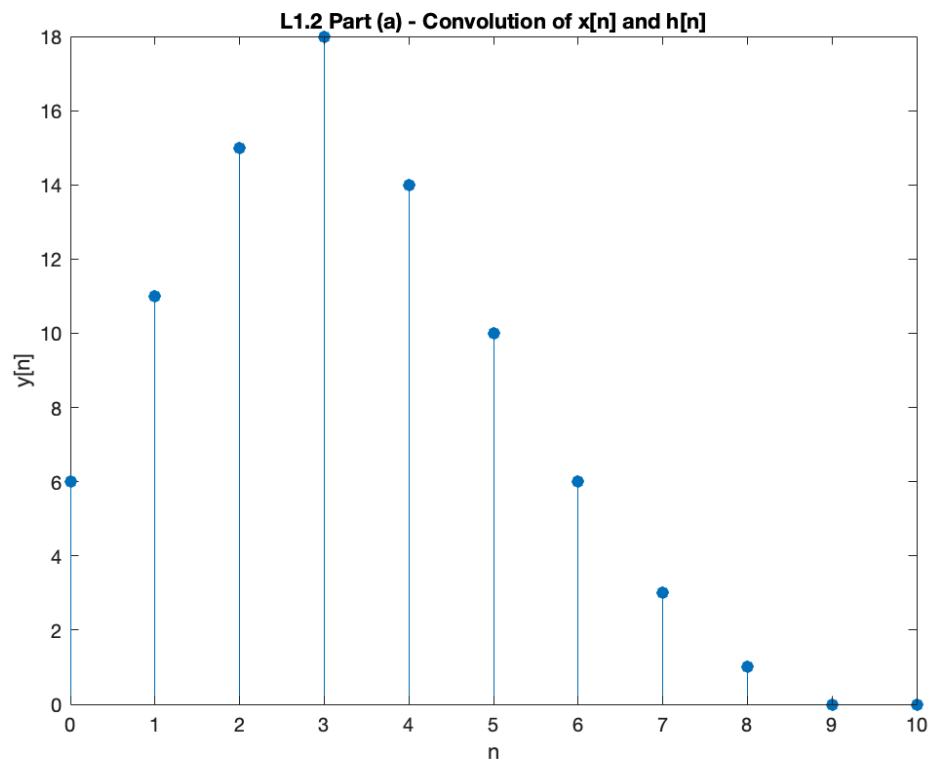


Figure 2.1.5



## L1.2 -



### L1.3 -

