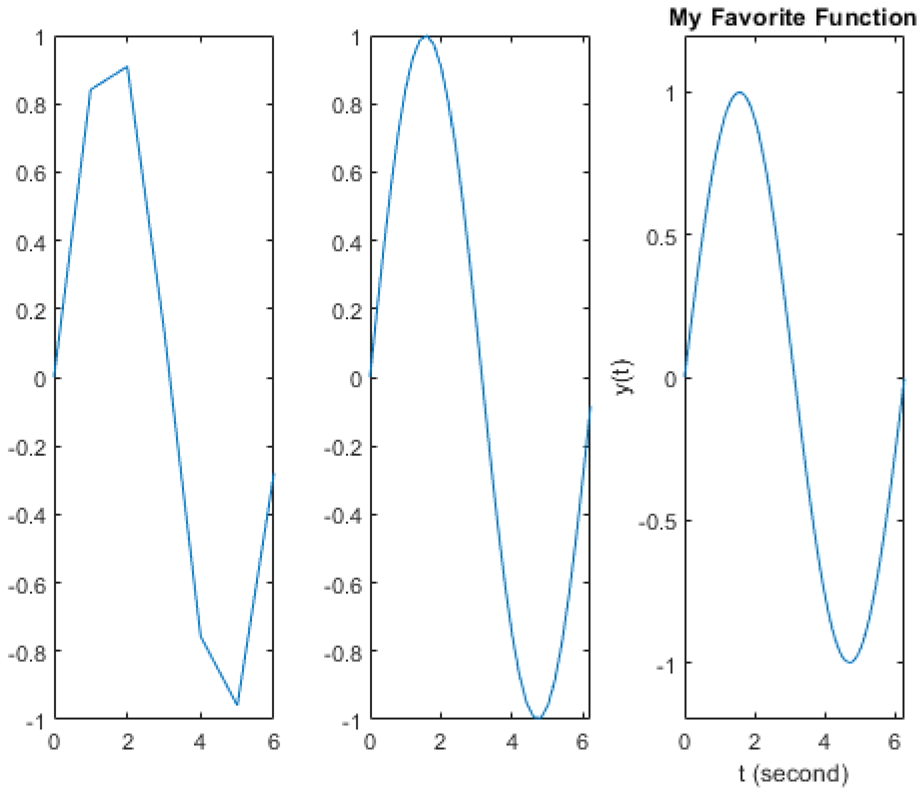
Contents

Part1.a

```
t1 = 0:2*pi;

t2 = 0:0.2:2*pi;

t3 = 0:0.02:2*pi;



figure(1)

subplot(1,3,1)

plot(t1,sin(t1))



subplot(1,3,2)

plot(t2,sin(t2))



subplot(1,3,3)

plot(t3,sin(t3))



%For the last graph, add a title and axis labels with:

title('My Favorite Function')
```

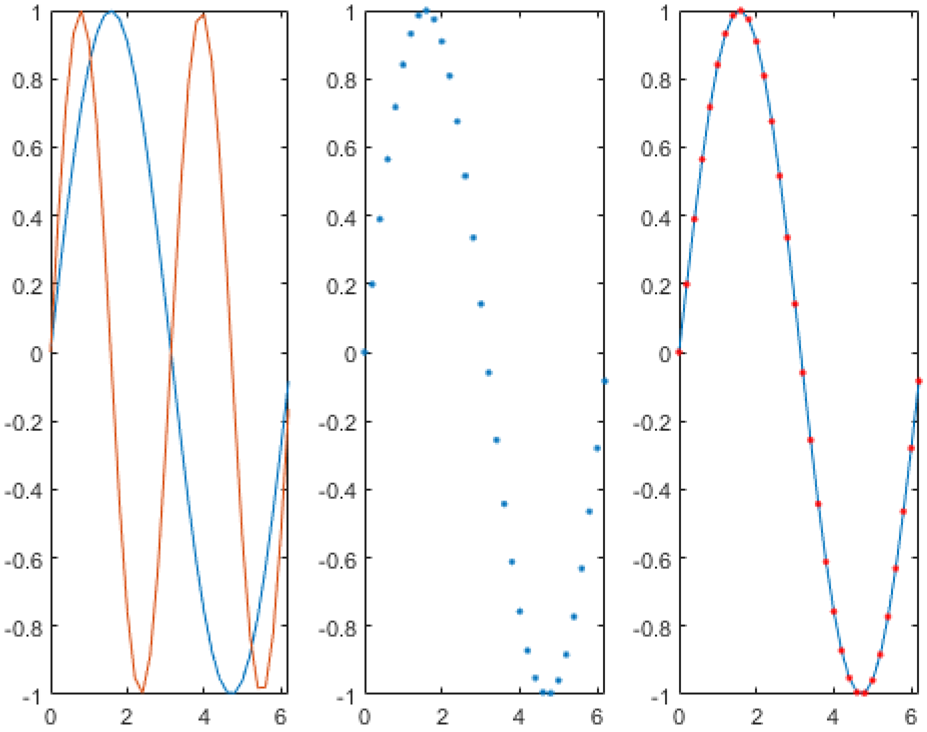
```
xlabel('t (second)')

ylabel('y(t)')



%Change the last axis with

axis([0 2*pi -1.2 1.2])
```



In the part1.a, three graphs are different because the three graphs have different increments from 0 to 2 pi. The first graph is increased by 1. The second graph is increased by 0.2. The third graph is increased by 0.02. There, the third graph has a smooth curve compared to other graphs.

part1.b

```
figure(2)

t4 = 0:0.2:2*pi;



subplot(1,3,1)

plot(t4,sin(t4),t4,sin(2*t4))

subplot(1,3,2)

plot(t4,sin(t4),'.')

subplot(1,3,3)

plot(t4,sin(t4),t4,sin(t4),'r.')
```

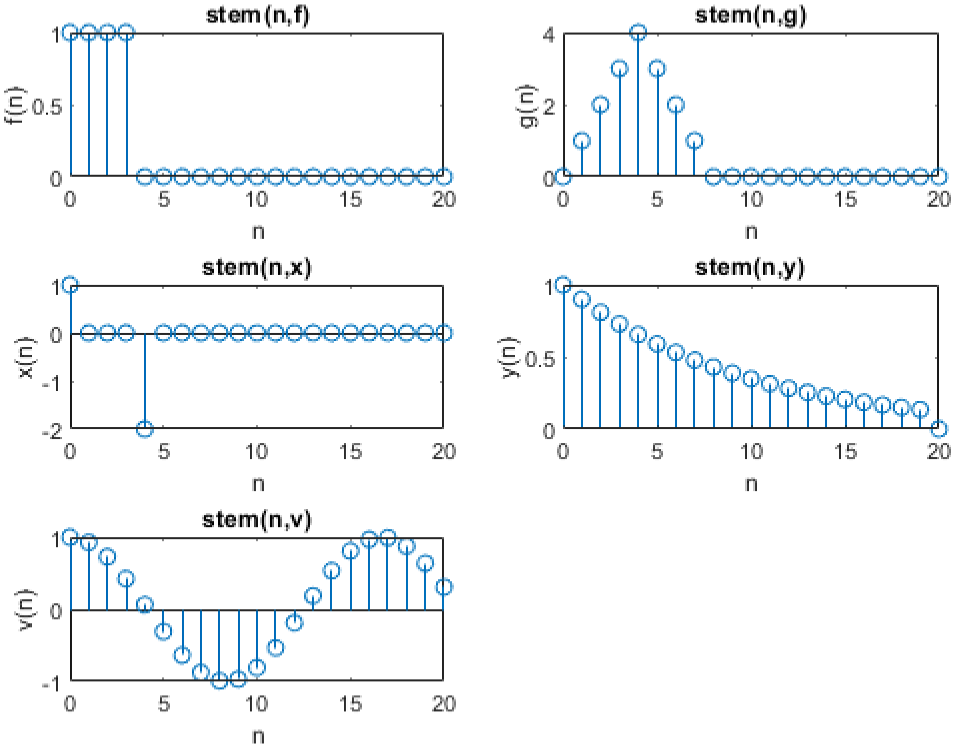


In part1.b, 'r' stands for the red color. So, it makes the dots on the graph red.

part2

```
%Plotting Discrete-Time signals

figure(3)

n = 0 : 20;



%f(n) = u(n)?u(n?4)

f = (n>=0)-(n>=4);

subplot (3,2,1)

stem(n,f)

title('stem(n,f)')

ylabel('f(n)')

xlabel('n')



%g(n) = n · u(n)?2(n?4) · u(n?4) + (n?8) · u(n?8)

g = (n.*(n>=0))-(2.*(n-4).*(n>=4))+((n-8).*(n>=8));

subplot(3,2,2)

stem(n,g)

title('stem(n,g)')

ylabel('g(n)')

xlabel('n')



%x(n) = ?(n)?2 ?(n?4)
```

```
x = (1.*(n==0))-(2.*(n==4));

subplot(3,2,3)

stem(n,x)

title('stem(n,x)')

ylabel('x(n)')

xlabel('n')



%y(n) = (0.9)n (u(n)?u(n?20))

y = (0.9.^n).*(1-(n>=20));

subplot (3,2,4)

stem(n,y)

title('stem(n,y)')

ylabel('y(n)')

xlabel('n')



%v(n) = cos(0.12 ?n) u(n)

v = cos(0.12*pi*n).*(n>=0);

subplot(3,2,5)

stem(n,v)

title('stem(n,v)')

ylabel('v(n)')

xlabel('n')
```



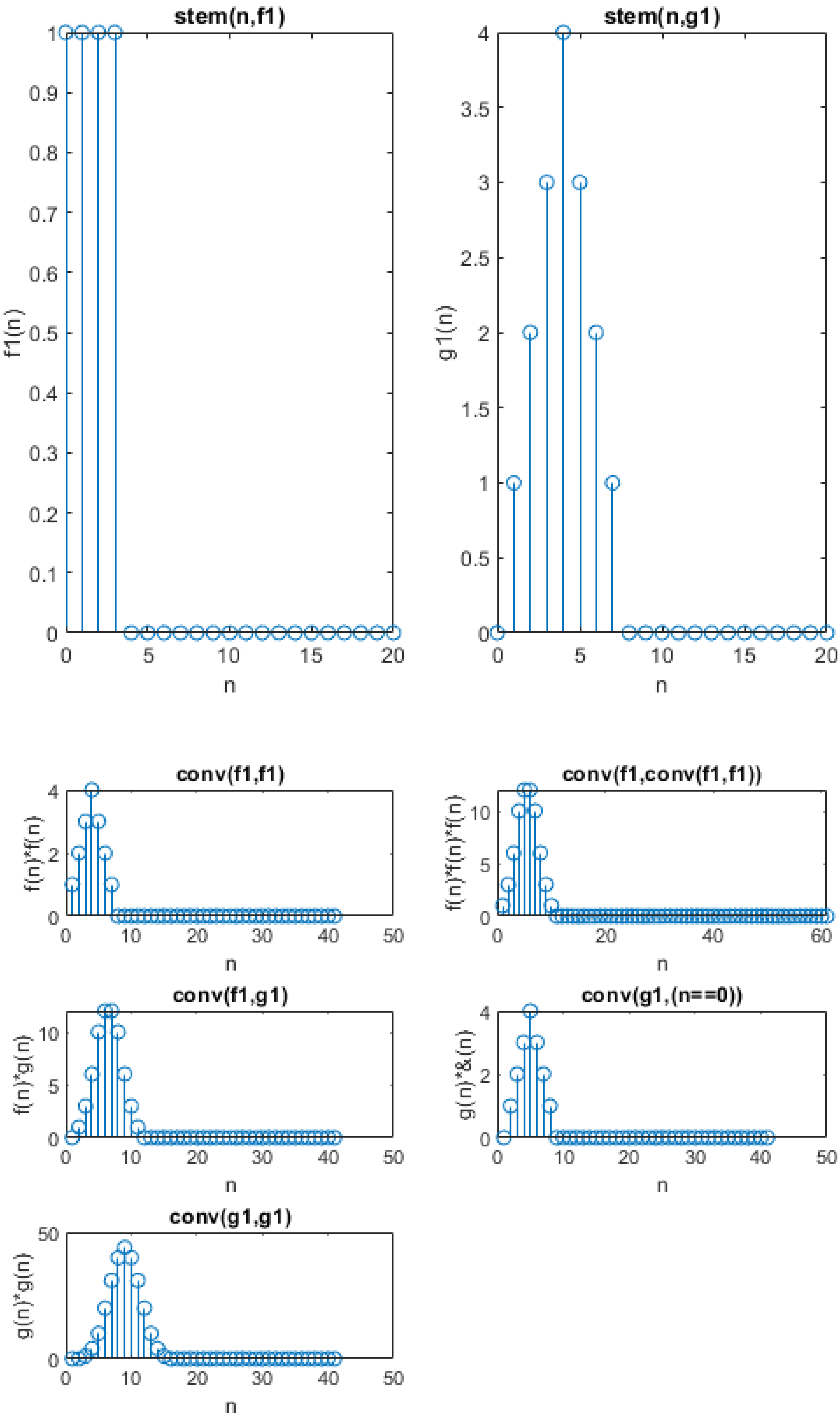
stem(n,f)
f(n)
n
stem(n,g)
g(n)
n
stem(n,x)
x(n)
n
stem(n,y)
y(n)
n
stem(n,v)
v(n)
n

part3

```
%n = 0:20 (same as part2)

figure(4)



f1 = (n>=0)-(n>=4);

subplot (1,2,1)

stem(n,f1)

title('stem(n,f1)')

ylabel('f1(n)')

xlabel('n')



g1 = (n.*(n>=0))-(2.*(n-4).*(n>=4))+((n-8).*(n>=8));

subplot(1,2,2)

stem(n,g1)

title('stem(n,g1)')

ylabel('g1(n)')

xlabel('n')






y1 = conv(f1,f1);

y2 = conv(f1,conv(f1,f1));
```

```
y3 = conv(f1,g1);

y4 = conv(g1,(n==0));

y5 = conv(g1,g1);



figure(5)


subplot (3,2,1)

stem(y1)

title('conv(f1,f1)')

xlabel('n')

ylabel('f(n)*f(n)')


subplot (3,2,2)

stem(y2)

title('conv(f1,conv(f1,f1))')

xlabel('n')

ylabel('f(n)*f(n)*f(n)')


subplot (3,2,3)

stem(y3)

title('conv(f1,g1)')
```

```
xlabel('n')

ylabel('f(n)*g(n)')



subplot (3,2,4)

stem(y4)

title('conv(g1,(n==0))')

xlabel('n')

ylabel('g(n)*&(n)')



subplot (3,2,5)

stem(y5)

title('conv(g1,g1)')

xlabel('n')

ylabel('g(n)*g(n)')
```



According to the graphs above, we can observe that the signal g1(n) and f1(n)*f1(n) looks same except it moved by 1 left. Also, we observe the graphs f1(n) with f1(n)*f1(n) and with f1(n)*f1(n)*f1(n). By comparing the three graphs, we could see that the graph was expanding up and side wards.

part4

```
t = 0:0.3:3.3;

x2 = [6.0, -1.3, -8.0, -11.7, -11.0, -6.0, 1.3, 8.0, 11.7, 11.0, 6.0, -1.3];

figure(6)

plot(t,x2)

title('Sampled-Signal')

ylabel('y(x2)')

xlabel('Time (seconds)')
```