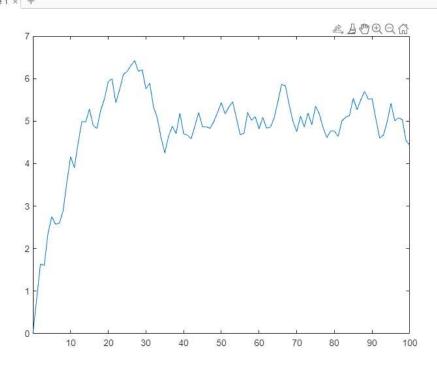
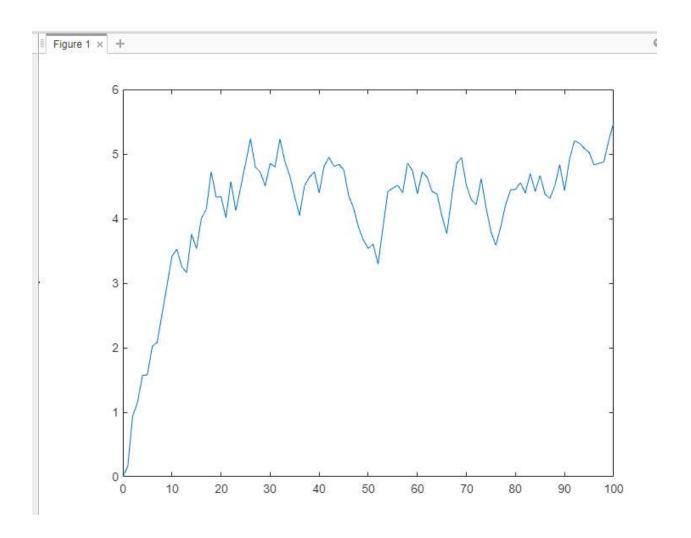
## Chander Bottomley EE111 Lab 2

## Task 1) a)

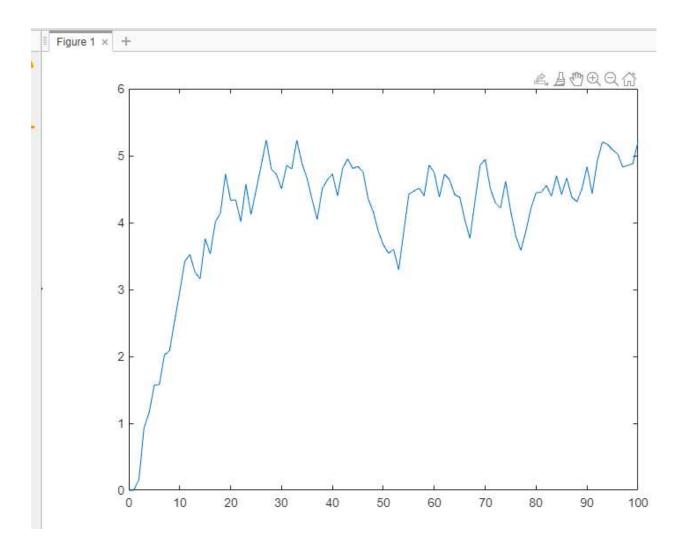
```
lab1.m × lab2.m × +
        ind_x = 0:99;
1 -
        x = rand(1, length(ind_x));
2 -
        ind_h = 1:99;
3 -
        h = 0.9.^(ind_h-1);
        h = [0, h];
6 -
        x = [x, zeros(1,200)];
        h = [h, zeros(1,200)];
        for i = 0:100
         t1 = x(1:i+1);
9 -
         t2 = h(1:i+1);
10 -
11 -
         t2 = fliplr(t2);
         t3 = t1 .* t2;
12 -
         y(i+1) = sum(t3);
13 -
14 -
        end
        ind_y = 0:100;
15 -
16 -
        plot(ind_y,y)
Figure 1 × +
```



```
1 -
        ind_x = 0:99;
        x = rand(1, length(ind_x));
2 -
        ind_h = 1:99;
        h = 0.9.^{(ind_h-1)};
5 -
        h = [0, h];
        x = [x, zeros(1,200)];
        h = [h, zeros(1,200)];
        for i = 0:100
8 - -
         t1 = x(1:i+1);
9 -
         t2 = h(1:i+1);
10 -
         t2 = fliplr(t2);
11 -
         t3 = t1 .* t2;
12 -
         y(i+1) = sum(t3);
13 -
        end
14 -
15 -
        ind_y = 0:100;
16 -
        yy = conv(x,h);
        plot(ind_y, yy(1:length(ind_y)))
17 -
```



```
lab1.m × lab2.m × lab21b.m × lab22a.m ×
            ind x = 0:99;
    1 -
    2 -
            x = rand(1, length(ind_x));
    3 -
            ind_h = 1:99;
            h = 0.9.^{(ind_h-1)};
    4 -
    5 -
            h = [0, h];
            x = [x, zeros(1,200)];
    6 -
            h = [h, zeros(1,200)];
    7 -
    8 - E for i = 0:100
            t1 = x(1:i+1);
    9 -
            t2 = h(1:i+1);
   10 -
            t2 = fliplr(t2);
   11 -
            t3 = t1 .* t2;
   12 -
            y(i+1) = sum(t3);
   13 -
   14 -
            end
            ind_y = 0:100;
   15 -
            y2(1) = 0;
   16 -
            x = [0 x];
   17 -
   18 - ☐ | for i = 0:100
            y2(i+2) = 0.9 * y2(i+1) + x(i+1);
   19 -
   20 -
            end
   21 -
            y2 = y2(2:end);
            n = 0:100;
   22 -
            plot(n,y2)
   23 -
b) 24
```

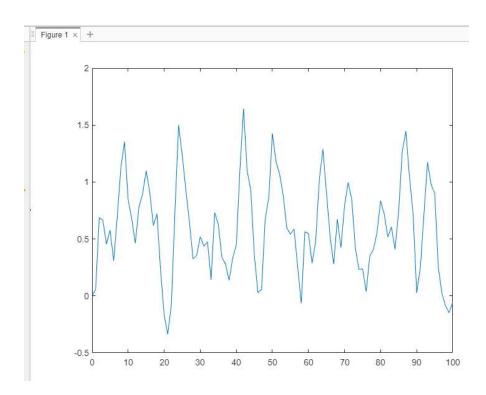


c) These two graphs are the same

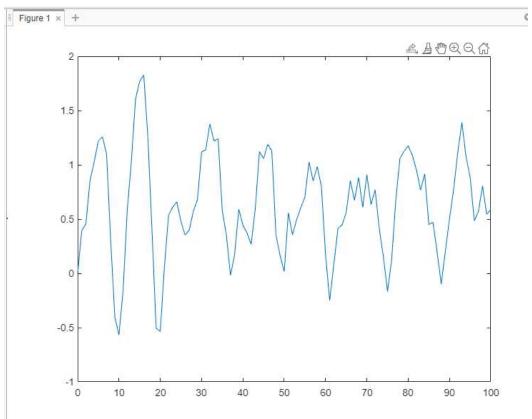
Task 2:

a)

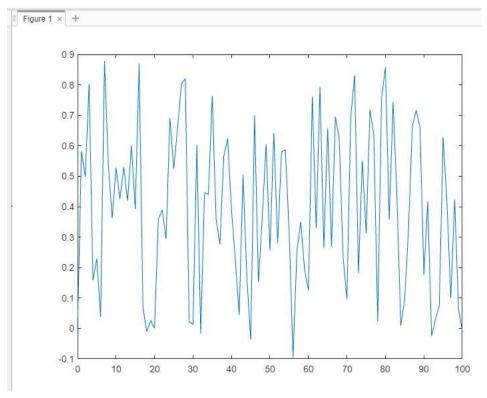
```
lab1.m × lab2.m × lab21b.m × lab22a.m × +
        ind x = 0:99;
1 -
        x = rand(1, length(ind_x));
2 -
        ind h = 1:99;
3 -
        h = 0.9.^{(ind_h - 1)} .* cos((pi/5) * ind_h-1);
        h = [0, h];
        x = [x, zeros(1,200)];
        h = [h, zeros(1,200)];
       for i = 0:100
        temp1 = x(1:i+1);
9 -
        temp2 = h(1:i+1);
10 -
11 -
        temp2 = fliplr(temp2);
         temp3 = temp1 .* temp2;
12 -
         y(i+1) = sum(temp3);
13 -
        end
14 -
        ind_y = 0:100;
15 -
        plot(ind_y,y)
16 -
17
```



```
lab1.m × lab2.m × lab21b.m × lab22a.m × +
1 -
        ind_x = 0:99;
        x = rand(1, length(ind_x));
2 -
3 -
        ind_h = 1:99;
        h = 0.9.^(ind_h - 1) .* cos((pi/5) * ind_h-1);
4 -
        h = [0, h];
5 -
        x = [x, zeros(1,200)];
6 -
        h = [h, zeros(1,200)];
7 -
        for i = 0:100
8 - -
9 -
         temp1 = x(1:i+1);
        temp2 = h(1:i+1);
10 -
        temp2 = fliplr(temp2);
11 -
12 -
        temp3 = temp1 .* temp2;
        y(i+1) = sum(temp3);
13 -
14 -
        end
        ind_y = 0:100;
15 -
16 -
        yy = conv(x,h);
        plot(ind_y, yy(1:length(ind_y)))
17 -
18
```



```
lab1.m × lab2.m × lab21b.m × lab22a.m × +
    1 -
            ind_x = 0:99;
    2 -
            x = rand(1, length(ind_x));
            ind_h = 1:99;
    3 -
            h = 0.9.^{(ind_h - 1)} \cdot cos((pi/5) * ind_h-1);
    4 -
            h = [0, h];
    5 -
            x = [x, zeros(1,200)];
    7 -
            h = [h, zeros(1,200)];
           for i = 0:100
    9 -
            temp1 = x(1:i+1);
   10 -
            temp2 = h(1:i+1);
            temp2 = fliplr(temp2);
   1 --
            temp3 = temp1 .* temp2;
   2 -
   13 -
            y(i+1) = sum(temp3);
   4 -
            end
            ind_y = 0:100;
   15 -
   16
            %yy = conv(x,h);
   17 -
            y3(1) = 0;
            y3(2) = 0;
   18 -
   19 -
            x = [0, 0, x];
    20 - 🗇 for i = 0:100
            y3(i+3) = 1.8 * cos(pi/5) * y3(i+2) - 0.8 * y3(i+2) + x(i+2) - 0.9 * cos(pi/5) * x(i+1);
   21 -
    22 -
    23 -
            y3 = y3(3:end);
    24 -
            n = 0:100;
    25 -
            plot(n,y3)
   26
b)
```



c) these two graphs are different