Signals and Systems

Lab 4

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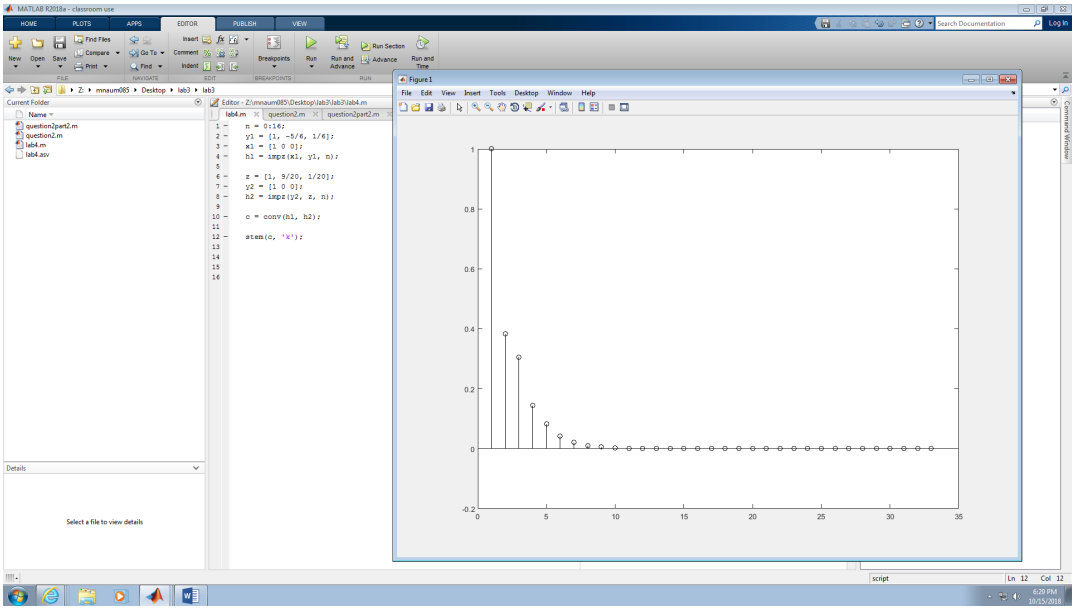
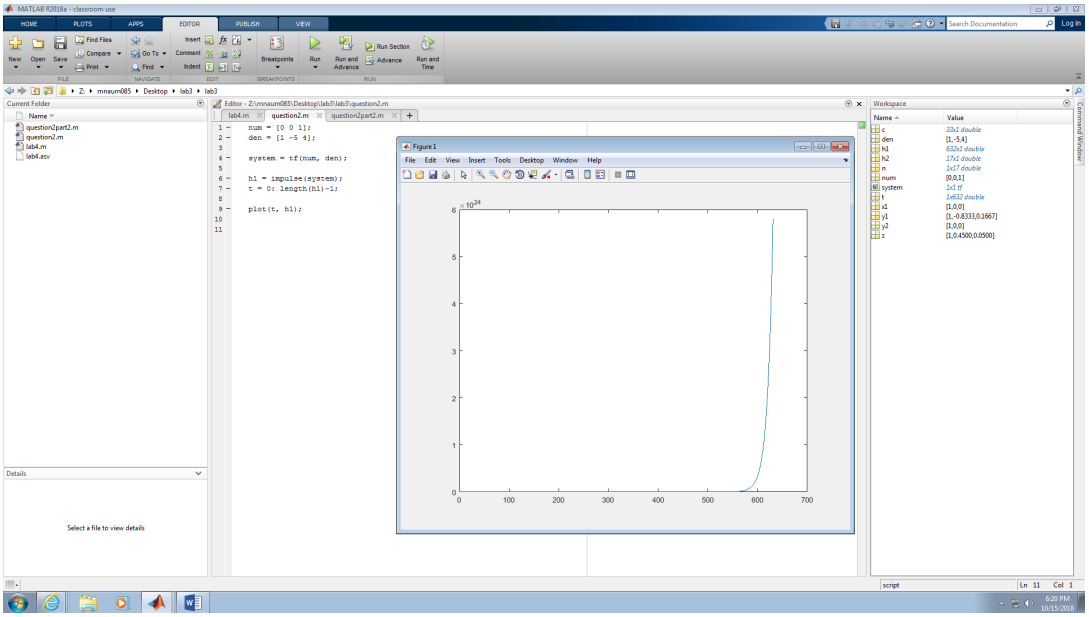
Question 1



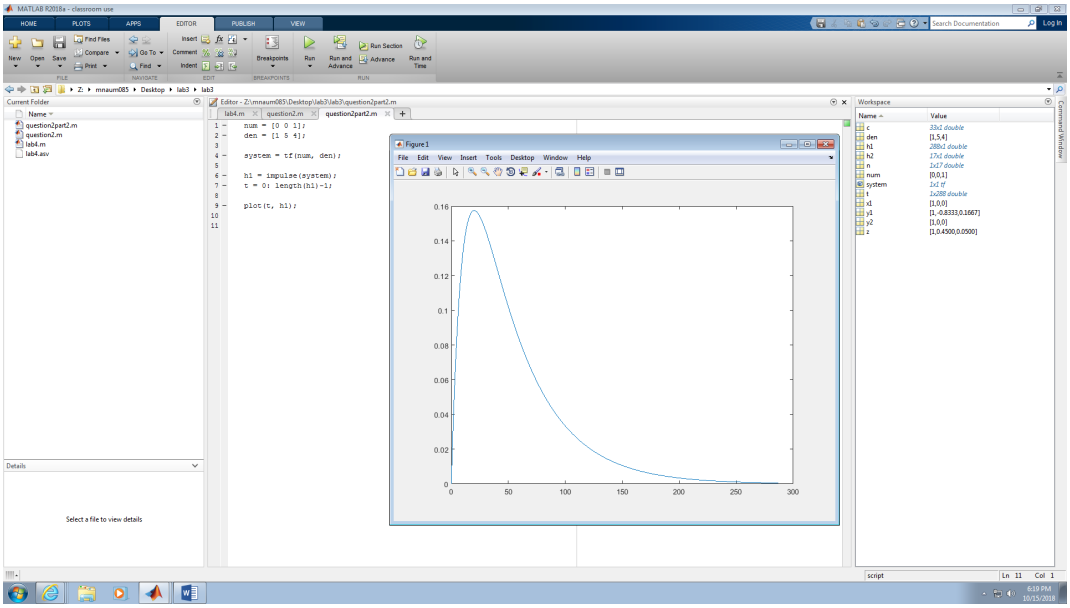
Question 2

Part 1



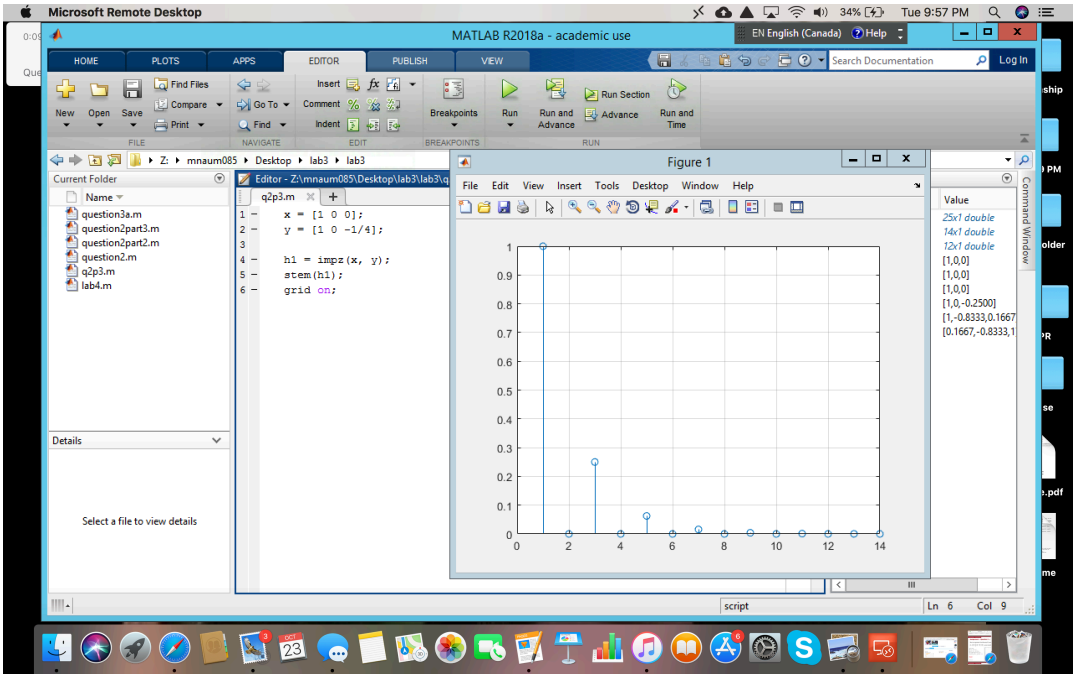
This system is not stable.

Part 2



This system is stable.

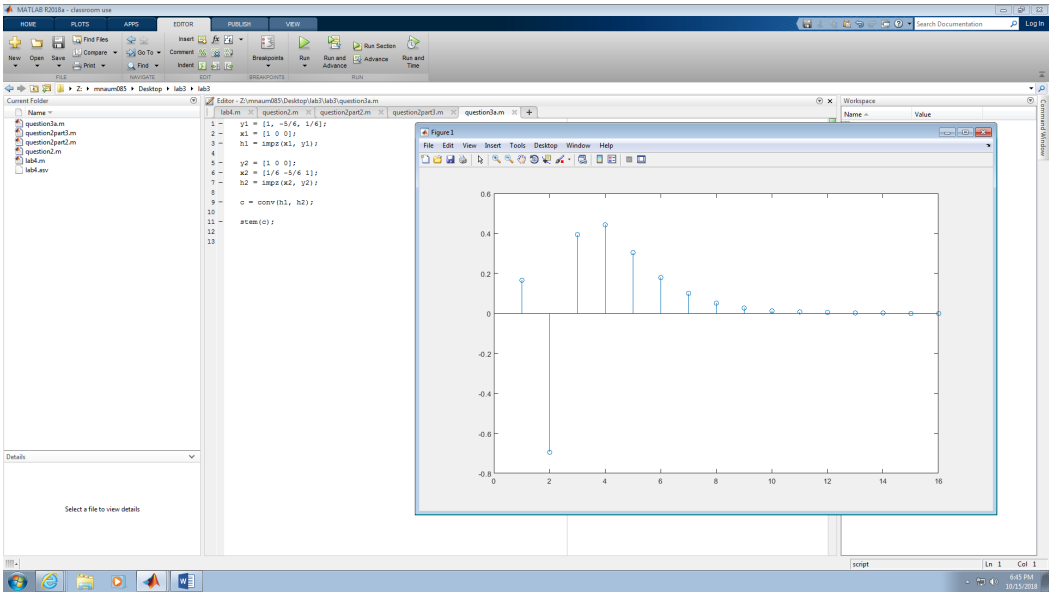
Part 3



This system is stable.

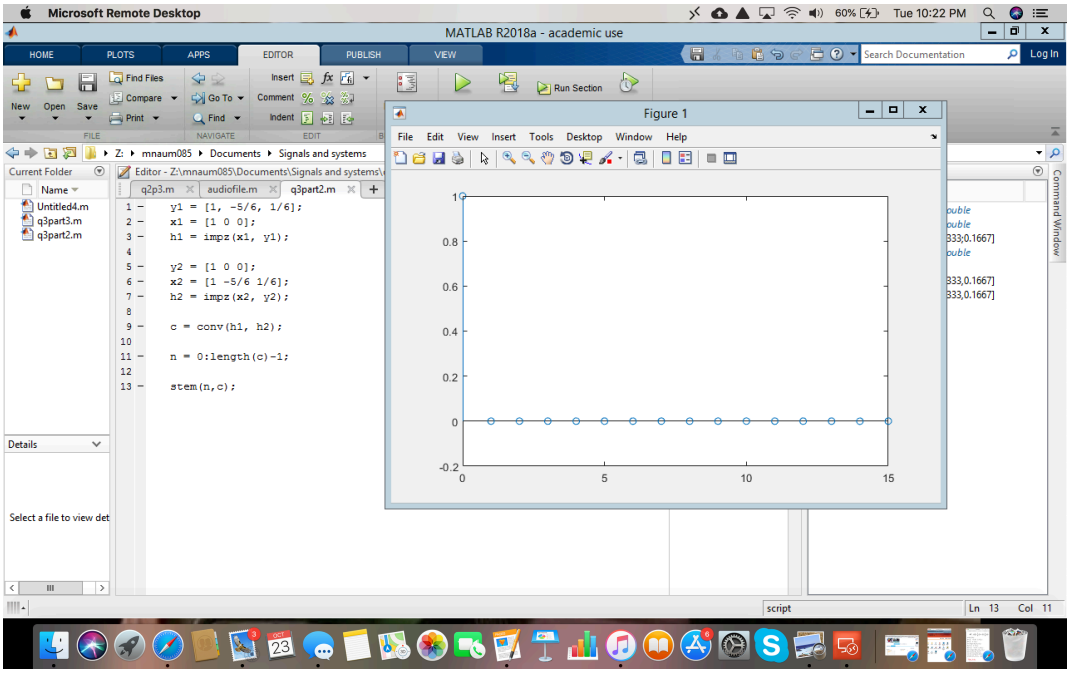
Question 3

Part 1



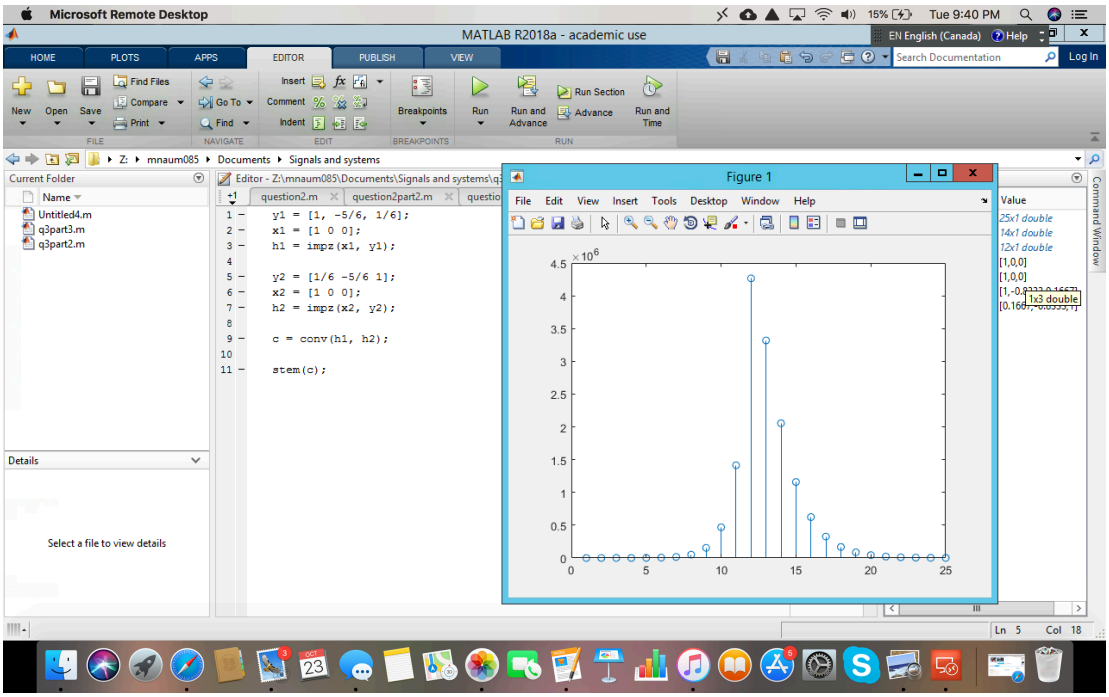
This system is not an invertible system.

Part 2



This system is an invertible system.

Part 3



This system is not an invertible system.

Question 4

As I was remote accessing matlab from my laptop the audiophile was not read properly, however I wrote the code to the best of my ability.

Code

```
clear all;
close all;
[x,fs]=audioread('Audio1.wav'); n_x=0:length(x)-1;
figure(1);
stem(n_x,x);
xlabel(’n');
ylabel('z[n]');
title('the input');
sound(x,fs);
n_h=0:1000;
a=1;
b=0.1*(0.99.^n_h);
h=b;
y_n=filter(b,a,x);
a_inv=[1 0];
b_inv=[10 -99/10];
h0=impz(b_inv,a_inv,n_h);
delta=conv(h,h0);
d_x=0:length(delta)-1;
figure(2);
stem(d_x,delta);
```

```
xlabel('n');
ylabel('\delta[n]');
title('Verification of Inverse System’);
z=filter(b_inv,a_inv,y_n);
figure(3);
stem(n_x,z);
xlabel('n');
ylabel('z[n]');
title('Output of Inverse System');
sound(z,fs);
```