**ELEC 4700**

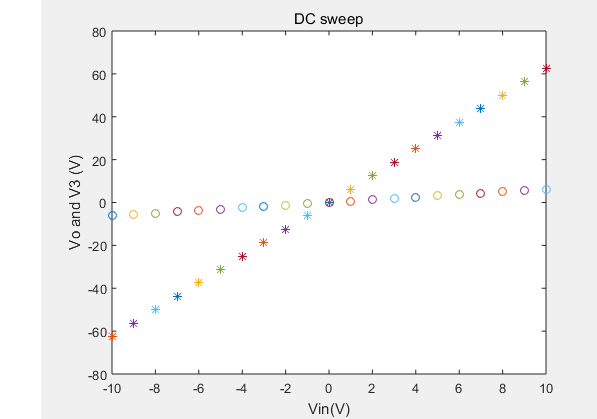
**Assignment 4**

**Name: Hongzhao Zheng**

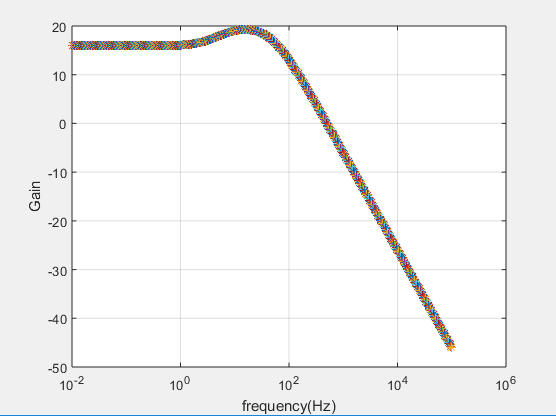
**Student number: 100965369**

**Part 1**

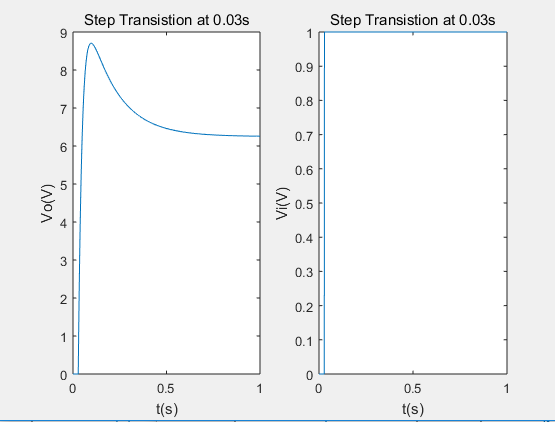
1. C and G matrices
2. Plot of DC sweep



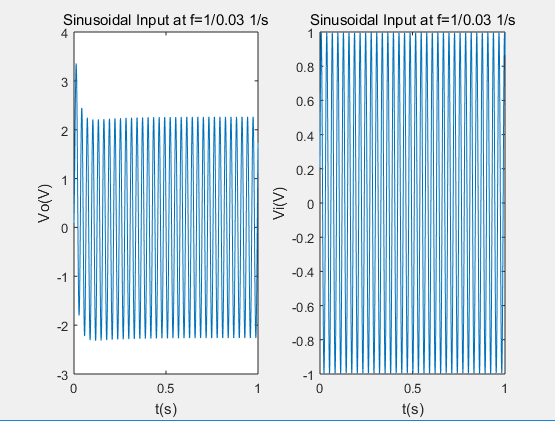
1. Plot of AC gain



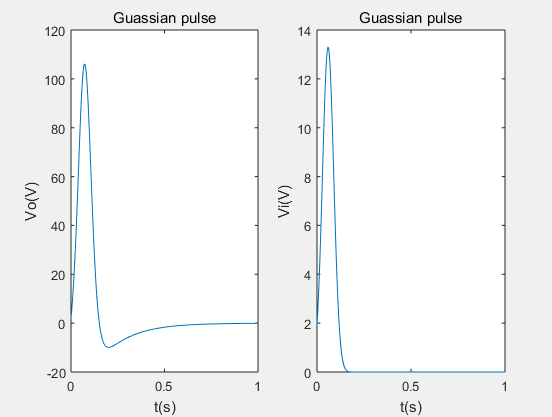
1. Step transition at t=0.03s



Sinusoidal Input

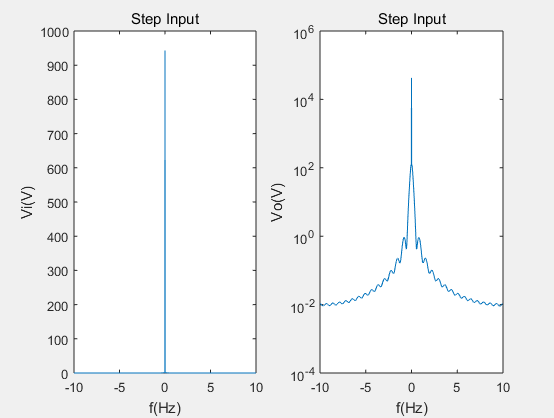


Gaussian pulse

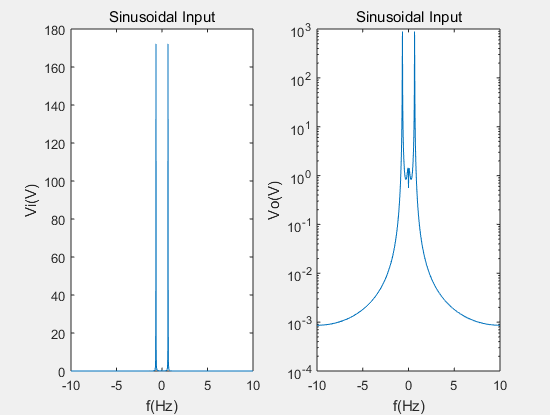


1. Fourier Transform plots of frequency response

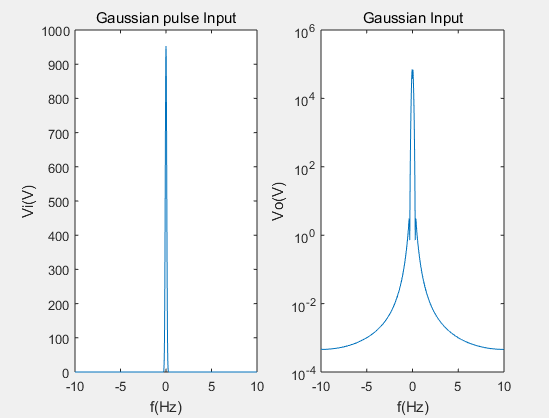
Step Transition



Sinusoidal Input

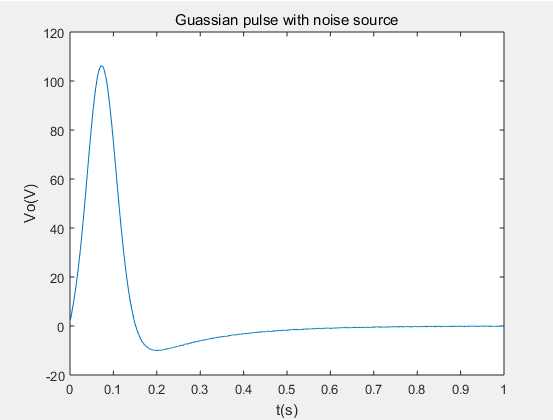


Gaussian pulse



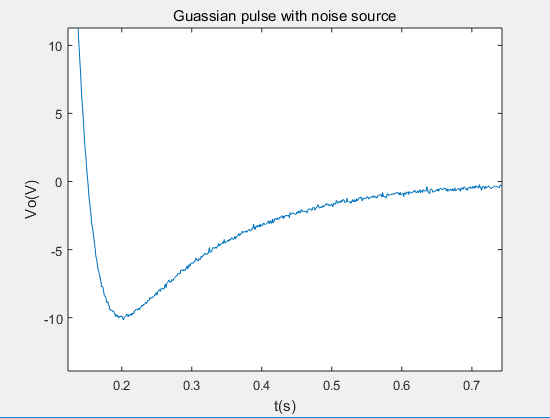
**PART 2**

1. Updated C matrix
2. Plot of Vout with noise source

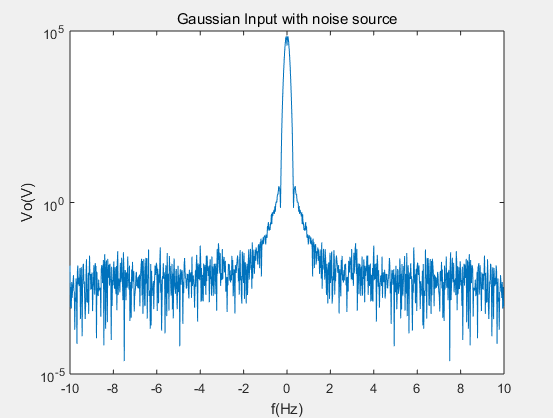


Vout vs t (Cn=0.00001, dt=0.001)

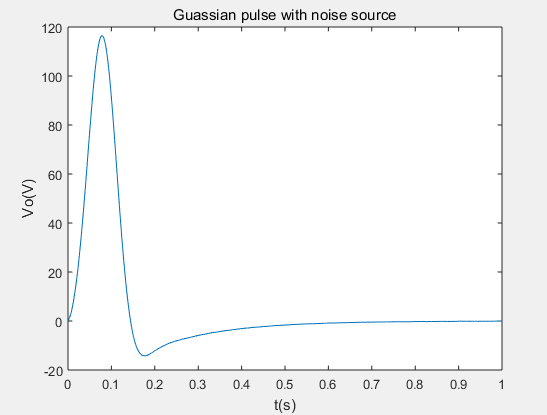
Plot of Vout with noise source (Zoomed in version)



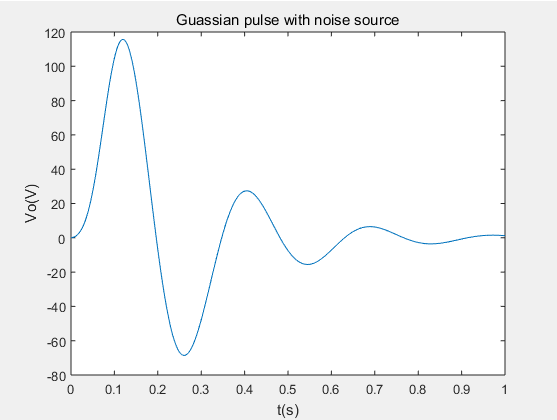
1. Fourier Transform plot



1. Vout with different Cn

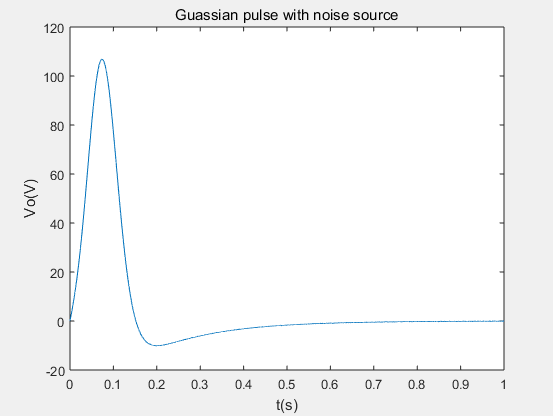


Vout vs t (Cn=0.001)



Vout vs t (Cn=0.01)

1. Vout with different time steps



Vout vs t (dt=0.0001)

**Part 3 (i.e. question 4)**

In this case, , we will need a B matrix so that the network of the circuit can be described by the following equation.