Homework #1

Problem 1

Script

```
clear all
close all
clc
format compact

MyFile = 'data.txt';
Fid = fopen (MyFile,'rt');

A = fscanf(Fid,'%f %f',[2,inf]);

B=A';
x=B(:,1);
y=B(:,2);

fclose(Fid);

plot(x,y,'o','MarkerSize',6,'MarkerEdgeColor','k','MarkerFaceColor','g')

init_value = 0.03;
tau = 85;
theta = 75;
gain =-0.0015;

fprintf('Time Constant       %g s\n',tau);
fprintf('Delay               %g s\n',theta);
fprintf('Process Gain        %g \n',gain);

s = tf('s');

hold on
G_foptd = exp(-theta*s)*gain/(tau*s + 1);
t = 0:5:500;
[z t] = step(G_foptd,t);
z = z + init_value;
plot (t,z,'Linewidth',2)
grid on
title ('Consistency Loop FC-104', 'Fontsize',15,'FontWeight','bold')
xlabel ('Time, s','Fontsize',13,'FontWeight','bold')
ylabel ('C(t)','Fontsize',13,'FontWeight','bold')
legend ({'Experiment','Fitting'},'Fontsize',12,'FontWeight','bold')

hold off
```

Result

Time Constant 85 s
Delay 75 s
Process Gain -0.0015

Graph