

```

clc
clear all %#ok<*CLALL>
% this code takes data from an SD card and outputs when the set temperature
% is reached during the heating process and the plots of the temperature
% sensors on the arduino

% Set temp:
% KP:80      KI:.9      %KD:10
% Results: Good results. No fluctuation primarily due to the build plate
% functioning as heat sink. Possibly increasing gain parameters to be more
% aggressive.

```

Reading in file

```

temp_reading=csvread('TEMP15.csv');
time=(temp_reading(:,1))/1000;           % Convert to Seconds
time2=time/60;                          % Convert to M
first_time=time2(1,1);
time3=time2-first_time;
temp=temp_reading(:,2);
temp_resin=temp_reading(:,3);
pwr=temp_reading(:,4);
% Declaring set temp
set_temp=temp_reading(:,5);
set_temperature=mode(set_temp);

% Calculating overshoot
overshoot=max(temp)-set_temperature

% Plotting
% Graph 1
figure(1);
plot(time3,temp,'k','Linewidth',2)
grid on
title('PID Controlled Heating Element')
xlabel('Time (m)')
ylabel('Temp (C)')
hold on
line([time3(1,1),max(time3)], [set_temperature,set_temperature], 'Linewidth',2);
plot(time3,temp_resin,'m','Linewidth',2)
legend('Glass Temp (C)', 'Set Temp', 'Resin Temp (C)')
hold off

% Graph 2
figure(2)
plot(time3,pwr,'r','Linewidth',2)
title('Power Output of PID Controller')
xlabel('Time (m)')
ylabel('Power Output')
grid on;
legend('Power Output')

```

overshoot =

-2.1000



