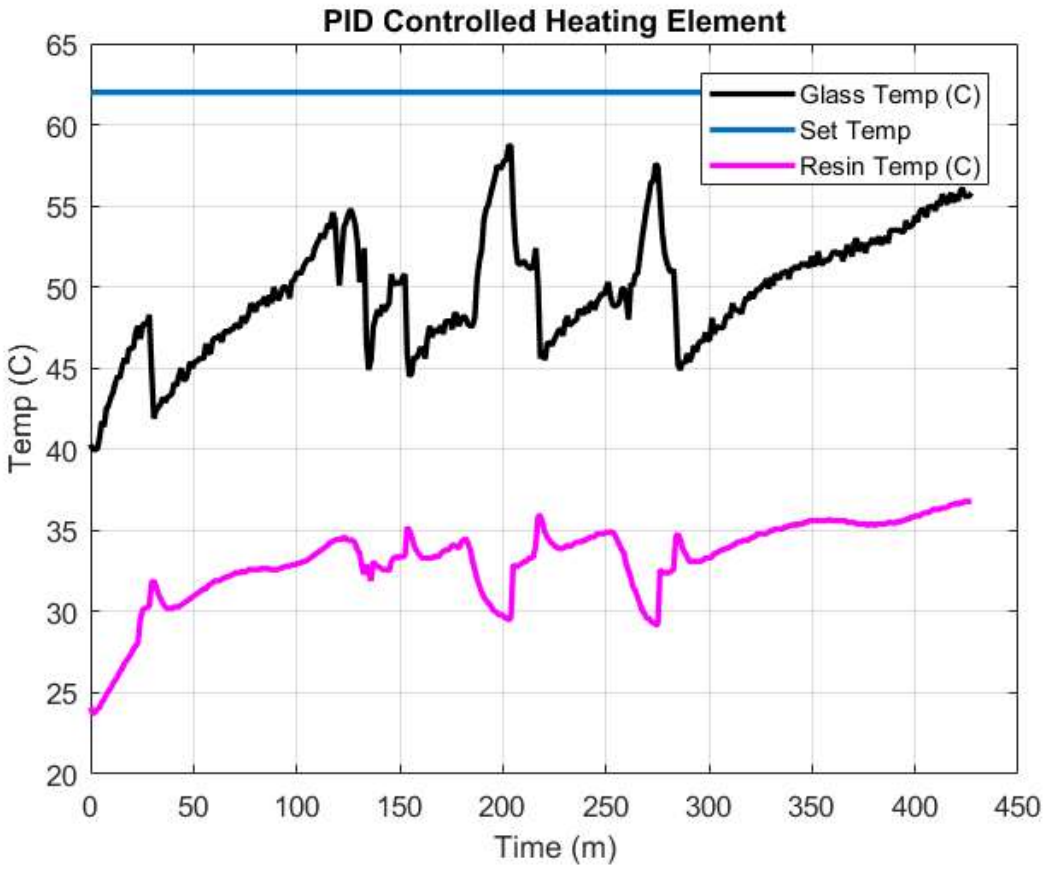
```
clc
clear all %#ok<*CLALL>
% this code takes data from an SD card and outputs when the set temperature
% is reached during the heating process and how closely the graph sticks to
% the set temperature
% Returns time and overshoot

% 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
% aggresive.
```

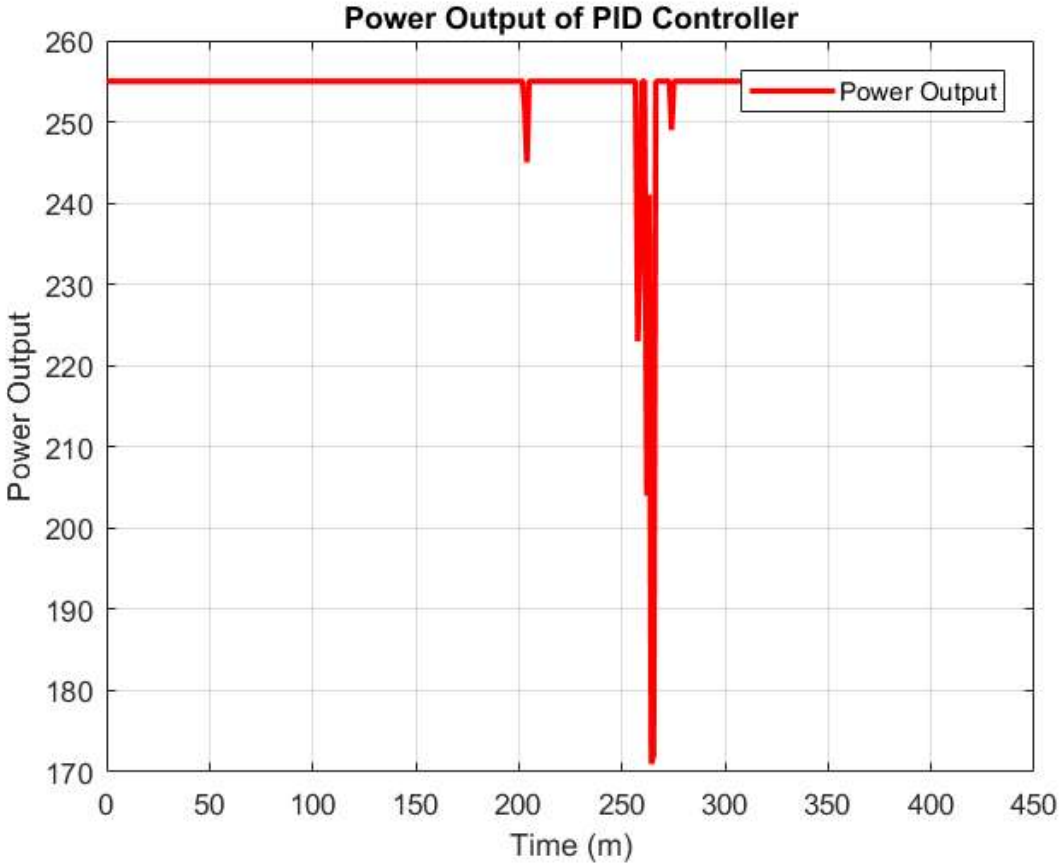
Reading in file

```
temp_reading=csvread('TEMP14.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

% Finding time to set temp
L1=length(temp);
%  j=1;
% i=0;
% while i~=1
%     temp1=temp(j,1);
%     if temp1>set_temperature
%         i=1;
%         break;
%     end
%     j=j+1;
% end
%
% time_2_setTemp=time(j,1)/60

% 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 =

   -3.3000
```





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