Table of Contents

.... 1
INITIALIZATION --- 1
__________________ 2
CALCULATIONS --- 2
__________________ 2
COMMAND WINDOW OUTPUTS --- 2
__________________ 4
ACADEMIC INTEGRITY STATEMENT --- 4
__________________ 4


```
function M3Alg_014_05

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%
% ENGR 132 Program Description
% This executive function calculates mean and std Tau for 5 different
%
%
% Function Call
%  [SSE] = M3Calibration_014_05(yL1,yH1,ts1,tau1,yData,time,heating)
%
% Input Arguments
% none
%
% Output Arguments
% none
%
% Assignment Information
% Assignment:         Final Project
%   Team ID:            014-05
%   Team Members:       Alex Pieprzycki, apieprzy@purdue.edu
%                       Colin Jamison, cjamison@purdue.edu
%                       Peter Swales, pswales@purdue.edu
%      Micah Huffman, mhuffma11@purdue.edu
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%
```

INITIALIZATION ---

```
data = csvread('fos_time_histories.csv');

time = data(:,1); %Time data

rangeData = 21;  %Specifies which current model of thermocouple
 program is analyzing
oldRangeData = 1; %Specifies which past range was anaylzed
aggregateTau = 0; %5x20 matrix of tau values
aggregateSSE = 0; %5x20 matrix of sse values
```

CALCULATIONS ---

```
%Written by Alex Pieprzycki
i = 2;
j = 1;
while(j <= 5) %Loops 5 times for the prototypes
 while(i <= rangeData) %i keeps incrementing by one, rangeData
 incements by 20 after inner loop to increase to correct range
  %[minimum, maximum, timeStep, tau, isHeating] =
 M2Alg1_014_05(data(:,i), time);
  [minimum, maximum, timeStep, tau, isHeating] = M3Alg2_014_05([time,
 data(:,i)]);
  aggregateSSE(j,i-oldRangeData) = M3Calibration_014_05(minimum,
 maximum, timeStep, tau, data(:,i), time, isHeating);
  aggregateTau(j,i-oldRangeData) = tau;
  i = i+1;
 end
 oldRangeData = rangeData;
 rangeData = rangeData + 20;
 j = j + 1;
end

%Calculates means,std, and see stats for all models of thermocouple
meanFS1 = mean(aggregateTau(1,:));
stdFS1 = std(aggregateTau(1,:));
sseFS1 = mean(aggregateSSE(1,:));
meanFS2 = mean(aggregateTau(2,:));
stdFS2 = std(aggregateTau(2,:));
sseFS2 = mean(aggregateSSE(2,:));
meanFS3 = mean(aggregateTau(3,:));
stdFS3 = std(aggregateTau(3,:));
sseFS3 = mean(aggregateSSE(3,:));
meanFS4 = mean(aggregateTau(4,:));
stdFS4 = std(aggregateTau(4,:));
sseFS4 = mean(aggregateSSE(4,:));
meanFS5 = mean(aggregateTau(5,:));
stdFS5 = std(aggregateTau(5,:));
sseFS5 = mean(aggregateSSE(5,:));
```

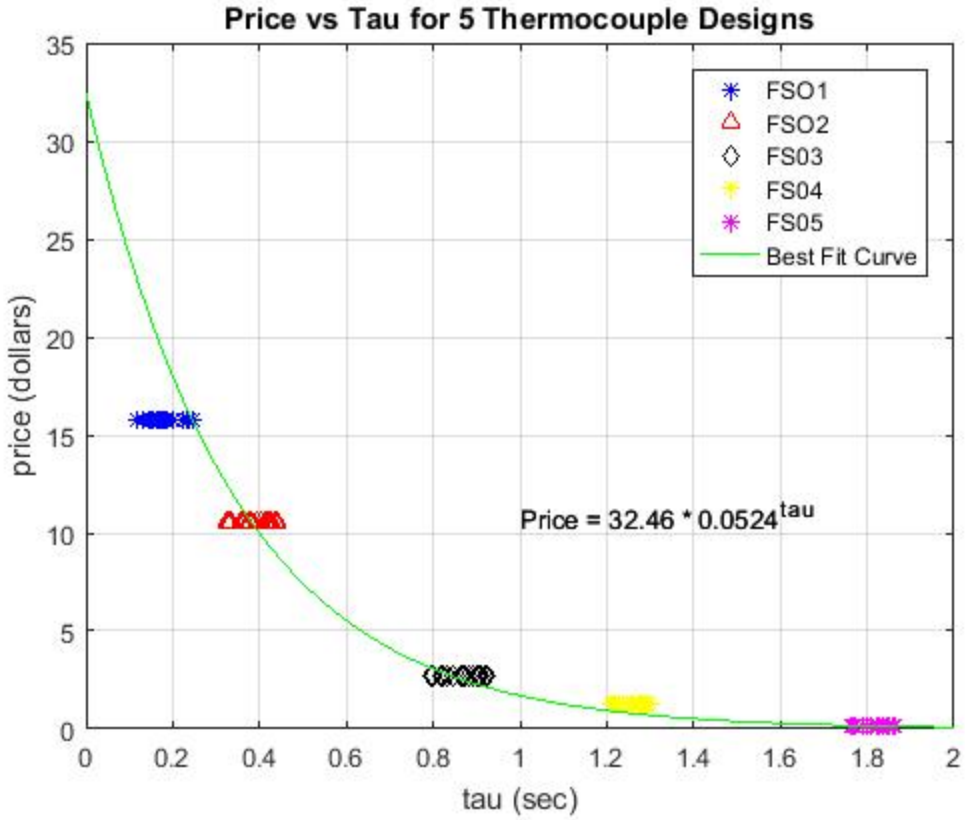
COMMAND WINDOW OUTPUTS ---

```
fprintf('\tMean\tStd\t\tMean SSE\n');
fprintf('FS1 %.4f\t%.4f\t%.4f\nFS2 %.4f\t%.4f\t%.4f\nFS3
 %.4f\t%.4f\t%.4f\nFS4 %.4f\t%.4f\t%.4f\nFS5 %.4f\t%.4f\t%.4f
\n',meanFS1,stdFS1,sseFS1,meanFS2,stdFS2,sseFS2,meanFS3,stdFS3,sseFS3,meanFS4,stdF
```

```
[SSE,SST,r2,m,b] = M3Regr_014_05(aggregateTau); %Calls the Regression
 function to plot a regression curve
fprintf('\nRegression line stats: \n');
fprintf('SSE: %.6f\nSST: %.6f\nr2: %.6f\nm: %.6f\nb: %.6f
\n',SSE,SST,r2,m,b);
```

```
 Mean Std  Mean SSE
FS1 0.1822 0.0399 2.2443
FS2 0.3826 0.0375 1.3680
FS3 0.8665 0.0407 1.0563
FS4 1.2595 0.0302 1.0342
FS5 1.8171 0.0330 1.2678

Regression line stats:
SSE: 0.888314
SST: 35.216758
r2: 0.974776
m: 0.052428
b: 32.457988
```



ACADEMIC INTEGRITY STATEMENT ---

I/We have not used source code obtained from any other unauthorized source, either modified or unmodified. Neither have I/we provided access to my/our code to another. The project I/we am/are submitting is my/our own original work.

Published with MATLAB® R2016a