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```
function [SSE,SST,r2,m,b] = M3Regr_014_05(tau)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
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% ENGR 132 Program Description
% This function graphs all 100 time histories of different thermocouple
% models
% by their price vs tau value. Then creates a regression line modling
% the price
% versus tau value.
%
% Function Call
% [SSE,SST,r2] = M3Regr_014_05(tau)
%
% Input Arguments
% 1. tau - this is a 5x20 matrix of all time history tau values
%
% Output Arguments
% 1. SSE: sum of squares of error for regression line
% 2. SST: SST for the regression line
% 3. r2: r^2 value for the regression line
% 4. m: slop of best fit line
% 5. b: b of best fit line
%
% 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, mhuffman@purdue.edu
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

INITIALIZATION ---

```
%Written by Micah Huffman
```

```

pricel = ones(1,20) * 15.77; %Creates a 1,20 matrixs of all the
    respective prices
price2 = ones(1,20) * 10.61;
price3 = ones(1,20) * 2.69;
price4 = ones(1,20) * 1.23;
price5 = ones(1,20) * 0.11;

```

CALCULATIONS ---

```

%Written by Micah Huffman
price = [pricel price2 price3 price4 price5]; %Concatenates price
    vectors
tauNew = [tau(1,:) tau(2,:) tau(3,:) tau(4,:) tau(5,:)]; %Concatenates
    matrix of taus

%Creates a regression of linearized data
pricelog = log10(price);
tauCoeffs = polyfit(tauNew,pricelog,1);
m = 10^tauCoeffs(1);
b = 10^tauCoeffs(2);
tauPlot = [0:.01:2];
polytau = b * m .^ tauPlot;

%Written by Colin Jamison
%Computes the r^2 of the line
coeffs = polyfit(pricelog, tauNew, 1);
regressTau = polyval(coeffs,pricelog);
SSE = sum((tauNew - regressTau).^2);
SST = sum((tauNew - mean(regressTau)).^2);
r2 = 1 - SSE / SST;

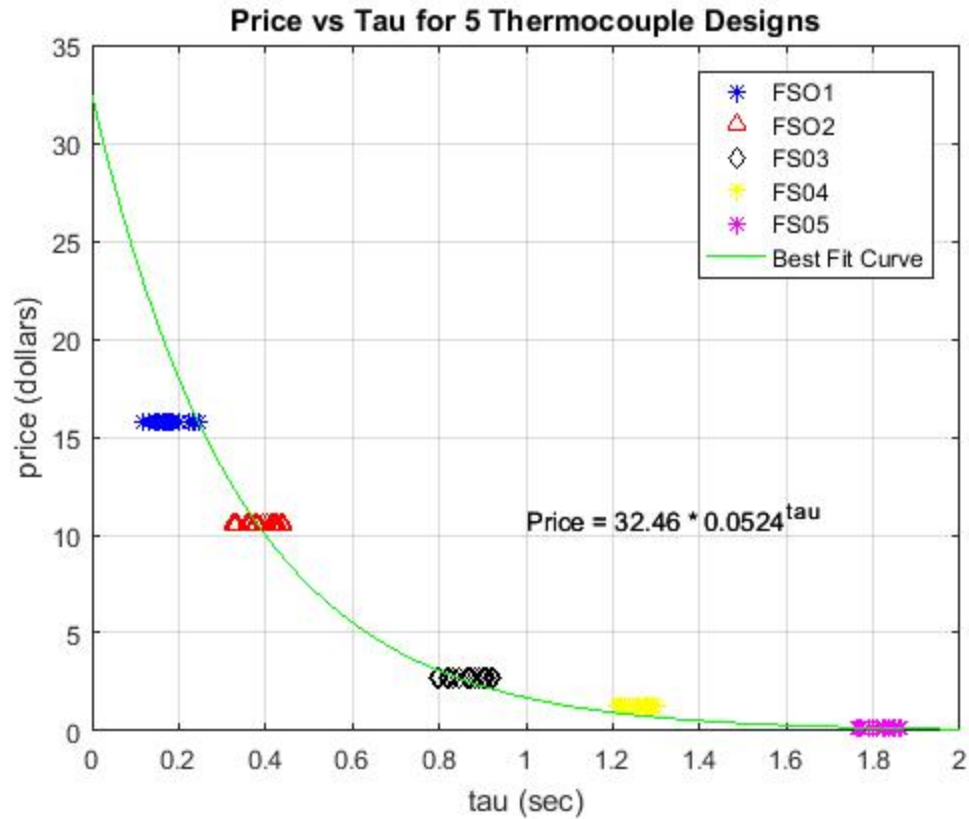
```

FORMATTED TEXT & FIGURE DISPLAYS ---

```

%Written by Colin Jamison
figure(1)
plot(tau(1,:),pricel,'b*',tau(2,:),price2,'r^',tau(3,:),price3,'kd',tau(4,:),price
ylabel('price (dollars)');
xlabel('tau (sec)');
title('Price vs Tau for 5 Thermocouple Designs');
grid on;
hold on;
plot(tauPlot,polytau,'g-');
text(1,11,'Price = 32.46 * 0.0524^t^a^u');
legend('FS01','FS02','FS03','FS04','FS05','Best Fit
    Curve','Location','northeast');%CHANGE LINE EQUATION TO BE IN RIGHT
    FORMAT

```



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.

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