Table of Contents


```
function [fcost] = PS06_fuelcost_model_hkolagan_thuter(fprice)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% ENGR 132
% Program Description
% A user-defined function that determines the linear model using the
 data provided in Problem 1 and then
%   use the resulting model to make predictions
%
% Function Call
%  [fcost] = PS06_fuelcost_model_hkolagan_thuter(fprice)
%
% Input Arguments
% 1. Fuel Price
%
% Output Arguments
% 1. Fuel Cost
%
% Assigment Information
%   Assignment:         PS 06, Problem 2
% Author:             Harith Kolaganti, hkolagan@purdue.edu
%   Team ID:            005-12
%   Paired Programmer:  Tyler Huter, thuter@purdue.edu
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

INITIALIZATION

```
fprice = 3.00;
data = csvread('Data_fuelcost.csv',1,1);
cost = data(:,4);
price = data(:,2);
```

CALCULATIONS

Perform linear regression on the fuel data using the polyfit command. The fuel data should be loaded in the function as to opposed to passed as an input argument.

```
P1 = polyfit(price,cost,1)

% Compute the predicted values of the linear model using the polyval
 command.
y_model = polyval(P1,price);

% Calculate the SSE, SST, and r2 values of the model.
SSE = mean((cost - y_model).^2)
SST = mean((cost - mean(y_model)).^2)
Rsqrd = 1 - SSE / SST

fcost = P1(1)*(fprice)+P1(2)
```

```
P1 =

   10.4619    2.7677


SSE =

    2.4959


SST =

   80.1643


Rsqrd =

    0.9689


fcost =

   34.1534
```

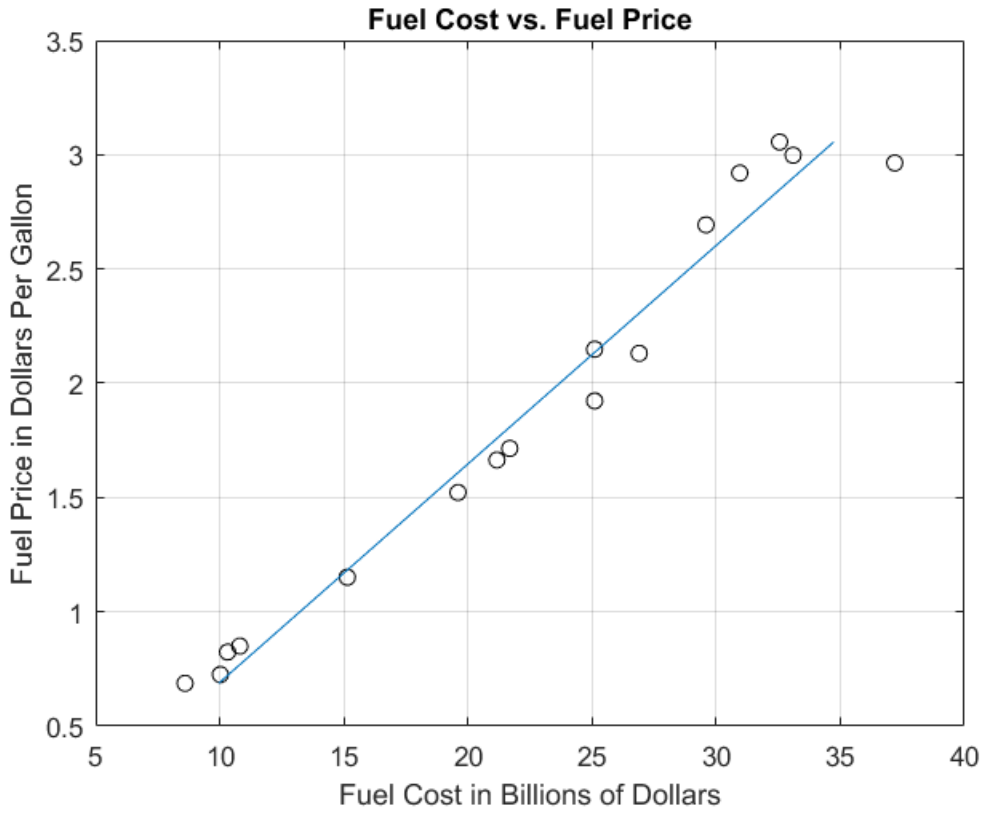
FORMATTED TEXT & FIGURE DISPLAYS

Generate a scatter plot and overlay your linear model on the data.

```
plot(cost, price,'ko')
xlabel('Fuel Cost in Billions of Dollars')
ylabel('Fuel Price in Dollars Per Gallon')
title('Fuel Cost vs. Fuel Price')
hold on;
plot(y_model,price)
grid on;
```

```
ans =

   34.1534
```



ANALYSIS

Q1

Compared to the Excel model, the MATLAB model is a lot more accurate because it yielded a higher r^2 value. The functions that MATLAB uses is far more precise because errors can be made while doing calculations by hand.

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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