Table of Contents


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%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% ENGR 132
% Program Description
%Using the given data find a linear model using the least square
 method through the polyfit function and then find the SSE,SST and R^2
 value of the model.
%
% Assigment Information
%   Assignment:     PS 04, Problem 2
%   Author:         Ranjan Behl, rbehl@purdue.edu
%   Team ID:        008-14
%   Contributor:    Name, login@purdue [repeat for each]
%   My contributor(s) helped me:
%     [ ] understand the assignment expectations without
%         telling me how they will approach it.
%     [ ] understand different ways to think about a solution
%         without helping me plan my solution.
%     [ ] think through the meaning of a specific error or
%         bug present in my code without looking at my code.
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

INITIALIZATION

```
data = csvread('Data_power_measurements.csv',1,0); % loading the data
 from excel
Ambtemp = data(:,1); % A vector has holds the Ambient temperature
 values
Electricaloutput = data(:,2); % a vector that holds the Net Hourly
 Electrial Output (MW) values
```

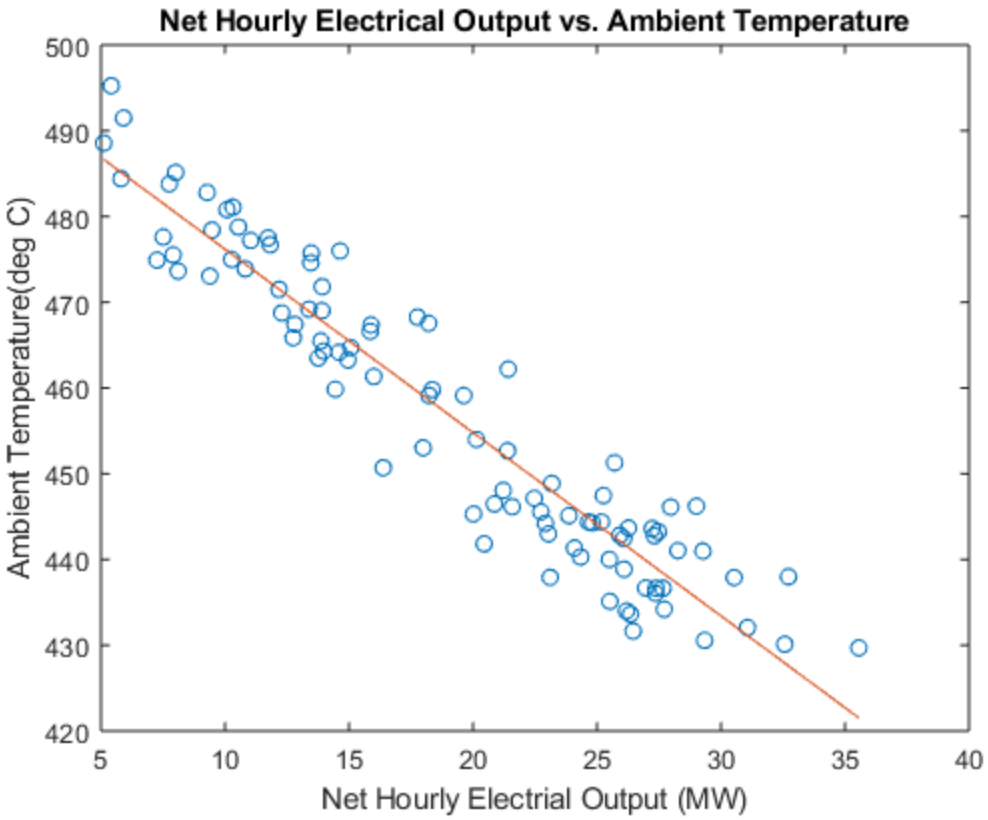
CALCULATIONS

```
%Part A
Linearreg = polyfit(Ambtemp,Electricaloutput,1); % peforming linear
 regression on the data using the polyfit function
%Part B
EOupdated = Linearreg(1)* Ambtemp + Linearreg(2); % computing the
 predicted values(electrical ouput) of the linear model
%Part C
SSE = sum((Electricaloutput - EOupdated).^2); % caculating the SSE
SST = sum((Electricaloutput - mean(Electricaloutput)).^2);% caculating
 the SST
rsqaured = (1-(SSE/SST));% caculating the r^2 value
```

FORMATTED TEXT & FIGURE DISPLAYS

```
%Part D
fprintf("\n The equation of the linear model is Electricaloutput = %f
 * AmbTemp + %f",Linearreg(1),Linearreg(2)); % printing the linear
 model equation
fprintf("\n The SSE is %f",SSE); % printing the SSE value
fprintf("\n The SST is %f",SST); % printing the SST  value
fprintf("\n The r^2 value is %f",rsqaured); % printing the r^2 value
%Part E
plot(Ambtemp,Electricaloutput,'o');% ploting the given data
hold on
plot(Ambtemp,EOupdated); % ploting the linear model over the given
 data
ylabel("Ambient Temperature(deg C)"); %labeling the y axis
xlabel("Net Hourly Electrial Output (MW)"); % labeling the x-axis
title("Net Hourly Electrical Output vs. Ambient Temperature"); %
 labeling the title
```

```
 The equation of the linear model is Electricaloutput = -2.138620 *
 AmbTemp + 497.569494
 The SSE is 2759.747101
 The SST is 28471.640326
 The r^2 value is 0.903070
```



ANALYSIS

-- Q1

```
Based on my observations there is no difference between the excel and
matlab least square model in terms of percison, however the matlab
version is much easier to implement than the excel version.
```

ACADEMIC INTEGRITY STATEMENT

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

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