HW# 6 - Nick McCullough

March 23, 2022

Problem 1

```
clear,clc
% Nick McCullough, AerE 161, HW 6, Problem 1
% Write a script that opens the data file and error checks it then
% plots the points
```

- - - -(insert your solution here)

```
fid = fopen("xypointts.dat"); % opens the data file xypointts.dat
if fid == -1 % if statement that displays unsuccessful opening
   disp('Please retry, file was not opened successfully.')
else % else statement
   xvector = 1:5; % create the x vector
   yvector = 1:5; % create the y vector
   for i = 1:5 % for loop to run five times
      char = fgetl(fid);
   end
   % this is the error check for closing the file
   close = fclose(fid); % close file
   if close == 0 % if statement for closing
      disp('File successfully closed.') % success
   else % else
      disp('File was not closed successfully.') % unsuccessful
   end % end
end % end
plot (xvector,yvector) % plot
xlabel('x points') % xlabel
ylabel('y points') % ylabel
title('x and y points') % title
```

Output 1:

------*(insert output (your results) here)*

```
File successfully closed.
>>
```

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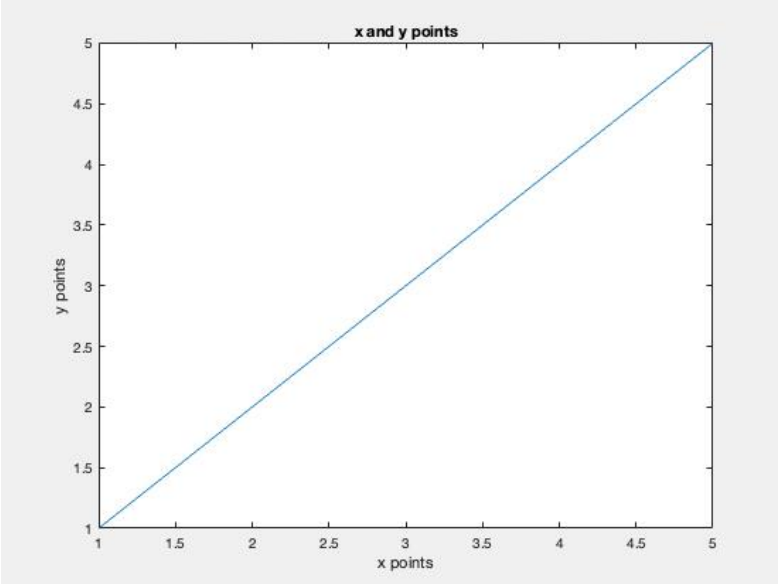

Problem 12.13

```
clear,clc
% Nick McCullough, AerE 161, HW 6, Problem 12.13
% create a file to store blade diameter, wind velocity, and electricity
% generated and then display the data in a graph (3D Graph)

% the graph will need a title and three value titles, x y z
% all data is saved in windturbine.dat

- - - -(insert your solution here)

% let's load the data
load windturbine.dat
% now let's write the plot code, we will use stem3 for x y z 3D graphing
stem3(windturbine(:,1),windturbine(:,2),windturbine(:,3))
% this reads and plots the data. it was stored in three different columns

% now let's create the x y and z labels for our data being read
xlabel('Blade Diameter of Wind Turbine in ft')
ylabel('Velocity of Wind in mph')
```

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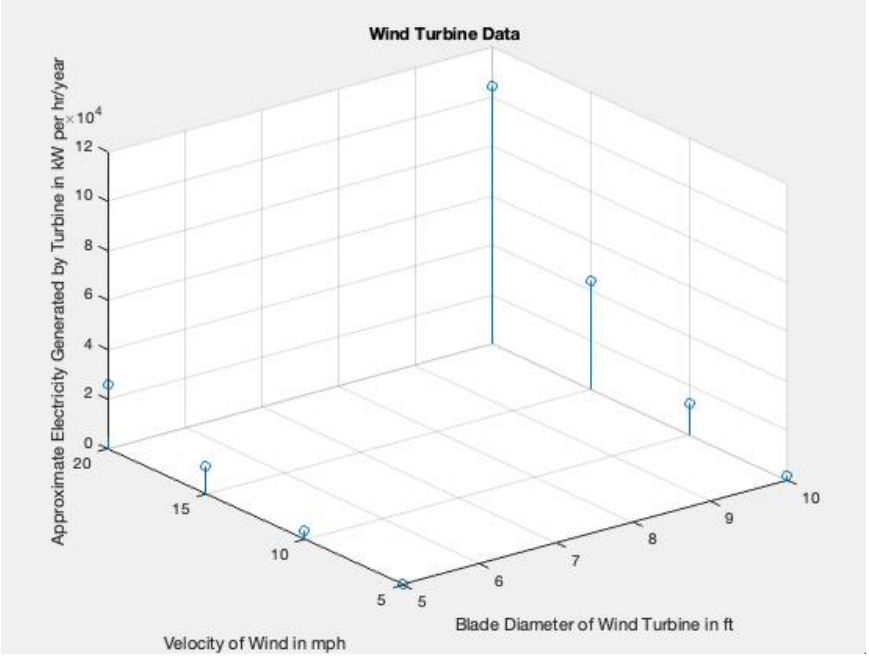
```
zlabel('Approximate Electricity Generated by Turbine in kW per hr/year')
title('Wind Turbine Data ') % title of graph
```

Output 1:

------*(insert output (your results) here)*



Problem 14.1

```
clear,clc
% Nick McCullough, AerE 161, HW 6, Problem 14.1
% marble manufacturing plant has two production lines, find the mean,
% median, mode and standard deviation of each line and ask the engineer
% to determine which production line is the best
```

- - - -*(insert your solution here)*

```
% let's create the data set variables for both production lines
A = [15.94 15.98 15.94 16.16 15.86 15.86 15.90 15.88]; % simple A variable
B = [15.96 15.94 16.02 16.10 15.92 16.00 15.96 16.02]; % simple B variable

% we will use built in matlab functions to calculate the mean, median, mode
% and standard deviation of each variable (production line) as shown below
```

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```
disp('The mean for production lines A and B are: ') % mean
disp('A:')
mean(A)
disp('B:')
mean(B)

disp('The median for production lines A and B are: ') % median
disp('A:')
median(A)
disp('B:')
median(B)

disp('The mode for production lines A and B are: ') % mode
disp('A:')
mode(A)
disp('B:')
mode(B)

disp('The standard deviation for production lines A and B are: ') % std
disp('A:')
std(A)
disp('B:')
std(B)

% now, let's create a user input (the engineer) to choose which proudction
% line is best based on the information presented to the engineer.
Choice = input('Please choose the production line with the lowest Standard Deviation in meeting
the 16mm marble requirement, A or B: ');
disp('Production line information based on your choice: ') % explaining what is being displayed
below
disp(Choice) % displays the choice, A or B, which reads the data variable above
```

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Output 1:

------*(insert output (your results) here)*

The mean for production lines A and B are:

A:

ans =

15.9400

B:

ans =

15.9900

The median for production lines A and B are:

A:

ans =

15.9200

B:

ans =

15.9800

The mode for production lines A and B are:

A:

ans =

```
   15.8600
```

B:

```
ans =

   15.9600
```

The standard deviation for production lines A and B are:

A:

```
ans =

    0.0986
```

B:

```
ans =

    0.0576
```

Please choose the production line with the lowest Standard Deviation in meeting the 16mm marble requirement, A or B: B

Production line information based on your choice:

```
   15.9600   15.9400   16.0200   16.1000   15.9200   16.0000   15.9600   16.0200
```

Problem 14.4

```
clear,clc
% Nick McCullough, AerE 161, HW 6, Problem 14.4
% create a vector of random integers from 0 to 50, and find the mean,
% but do not include the minimum and maximum values, use a function
```

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- - - -*(insert your solution here)*

```
function [x] = findmean(values)

minimumx = min(values); % variable for minmum value of "values"
maximumx = max(values); % variable for maximum value of "values"

x = (sum(values) - (minimumx) - (maximumx));
% write equation to sum the values and subtract the minimum and maximum

end

clear,clc
% Nick McCullough, AerE 161, HW 6, Problem 14.4
% create a vector of random integers from 0 to 50, and find the mean,
% but do not include the minimum and maximum values, use a function

x = randi(50,1,10); % variable x equal to random integers from 0 to 50
disp(x) % displays the random vector of integers

ans = (1/8)*findmean(x); % variable for findmean function divided by 8.
% we are dividing by 8, because there are originally 10 values, now only 8

disp('The mean of the values without the minimum and maximum is: ')
disp(ans) % displays ans variable with correct answer

% math adds up correctly after multiple attempts.
```

Output 1:

------*(insert output (your results) here)*

```
   10    12    45     2    25     9    49    36    26    24
```

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The mean of the values without the minimum and maximum is:

23.3750

Problem 14.11

```
clear,clc
% Nick McCullough, AerE 161, HW 6, Problem 14.4
% A student missed one of four exams in a course and the professor
% decided to use the “average” of the other three grades for the missed
% exam grade. % Which would be better for the student: the mean or the
% median if the three recorded grades were 99, 88, and 95? Test set 1
% What if the grades were 99, 70, and 77? Test set 2
```

- - - -*(insert your solution here)*

```
x = [99 88 95]; % create vector for the first set of test scores
y = [99 70 77]; % create vector for the second set of test scores

% display them.
disp('Test Scores 1:')
disp(x)
disp('Test Scores 2:')
disp(y)

mean1 = mean(x); % mean x equation variable
mean2 = mean(y); % mean y variable

median1 = median(x); % median x variable
median2 = median(y); % median y variable

%fprintf to show the mean and median of test sets 1 and 2
fprintf('The mean of tests sets 1 and 2 are: %d, %d \n',mean1,mean2)
fprintf('The median of tests sets 1 and 2 are: %d, %d \n\n',median1,median2)
```

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```
% display a description of what is shown
disp('The first set of test scores have a higher mean and median.')
disp('Just by glancing at the values of the first set,')
disp('you can conclude that the mean and median will be higher.')
```

Output 1:

------*(insert output (your results) here)*

```
Test Scores 1:
   99    88    95

Test Scores 2:
   99    70    77

The mean of tests sets 1 and 2 are: 94, 82
The median of tests sets 1 and 2 are: 95, 77

The first set of test scores have a higher mean and median.
Just by glancing at the values of the first set,
you can conclude that the mean and median will be higher.
>>
```