

Homework #10 Engineering 0711 - Fall 2009

Due: Wednesday, October 14

Your main script must call at least four (4) functions and perform the tasks as described below.

1. Function 1: Display a header
 - a. This function simply displays text, and thus requires no inputs or outputs. It should display your name, group number and class section as well as today's date and something like "This program loads and analyzes data...etc. etc."
 - b. Suggested first line of this function file: ***function header***
2. Function 2: Load Data
 - a. This function must load x and y data that is in either columns or rows (you will run your program with either "data1.dat" or "data2.dat" – get these from the Get Folder.)
 - b. The function should ask the user for the name of the file.
 - c. Suggested first line of this function file: ***function [x,y] = load_data***
3. Function 3: Computes the mean and standard deviation of a set of data.
 - a. This function should return the mean and standard deviation of a set of data to the main program.
 - b. You may use built-in MATLAB functions if desired.
 - c. Suggested first line of function file:
function [you determine what variables here, if any] = analysis(you determine what variables here, if any)
4. Function 4: Allows the user to either try a linear fit or any order polynomial.
 - a. Ask the user which fit they'd like to try and use a menu with a switch case to perform the necessary operations.
 - b. Plot the data and the fit line/curve then allow the user to decide if they want to try a different fit for the data set. For the linear fit, display the equation of the line on the plot. For the polynomial check the order of the degree entered by the user.
 - c. Add labels to the plot. The provided data is from a study of x = frying time (in seconds) for tortilla chips versus y=moisture content (%) in the chips.
 - d. Suggested first line of function file:
function [you determine what variables here, if any]=fitting(you determine what variables here, if any)

Program Requirements:

1. Your main script must contain your name, group number and class section as well as today's date in comment lines at the top.
2. Your main script must use comments throughout to detail what you've done.
3. Begin by displaying the header by calling function 1.
4. Use a loop to allow the user to analyze more than one data set. Control the loop by using the letters y or n. Check for user input errors, so the user must enter an (N or n) or (Y or y).
5. Next, in the main script call function 2 to load the data. Return the x and y data and plot the data using green diamonds. Provide the user a chance to view the plot before continuing.
6. Next call function 3 and display the mean and standard deviation for x, then the mean and standard deviation for y to the command window.

7. Finally call function 4 so that the user can compute and determine the best fit for the data (linear or any order polynomial).
8. The functions must perform the tasks as specified above.
9. Make sure your program is clean and doesn't display variables to the command window when they are not needed. Be sure to title and label any plots.
10. When you are finished, save your main script and all the functions to a folder called "your group name_HW7". Drop your folder into your instructor's preferred drop folder.

Sample Program Output:

```

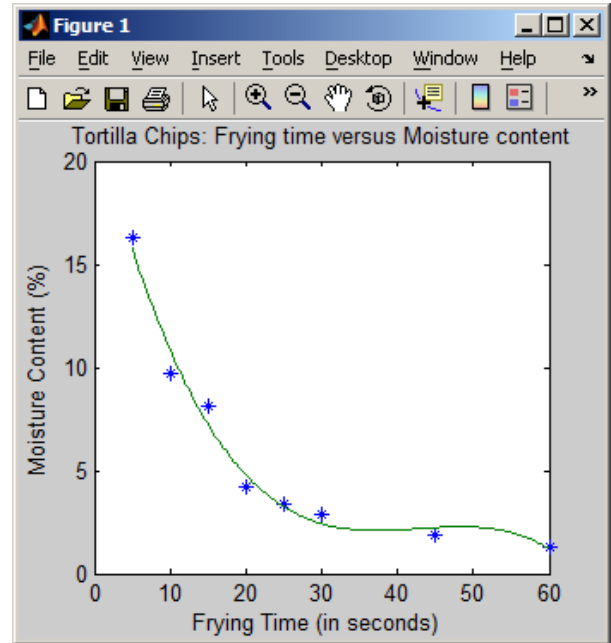
This program was written by Dan Budny
Group R01, Budny 6 pm section
Oct 26, 2005

This is a very fancy program to complete simple data
analysis
    It will compute means and standard deviations
    as well as allow the user to fit a line or curve
    to a set of data
Please enter the name of your data file: midterm_data1.dat
Press any key to continue
The mean of the x data is:
    26.2500

The standard deviation of the x data is:
    18.4681

The mean of the y data is:
    5.9750

The standard deviation of the y data is:
    5.1087
  
```



Hint:

This is going to be a very long program. Layout the logic before you start, and built the program in sections. Do you have existing programs that you can reuse? Make sure each section works before you go onto the next step. If you design your script by following the numbered list above you might find it helpful. Have fun!!!