COMP1200m - Lab 01
Due before 11:59 pm – Thursday, September 1
**Submit `Lab01.txt` and `Lab01.m` via Blackboard**

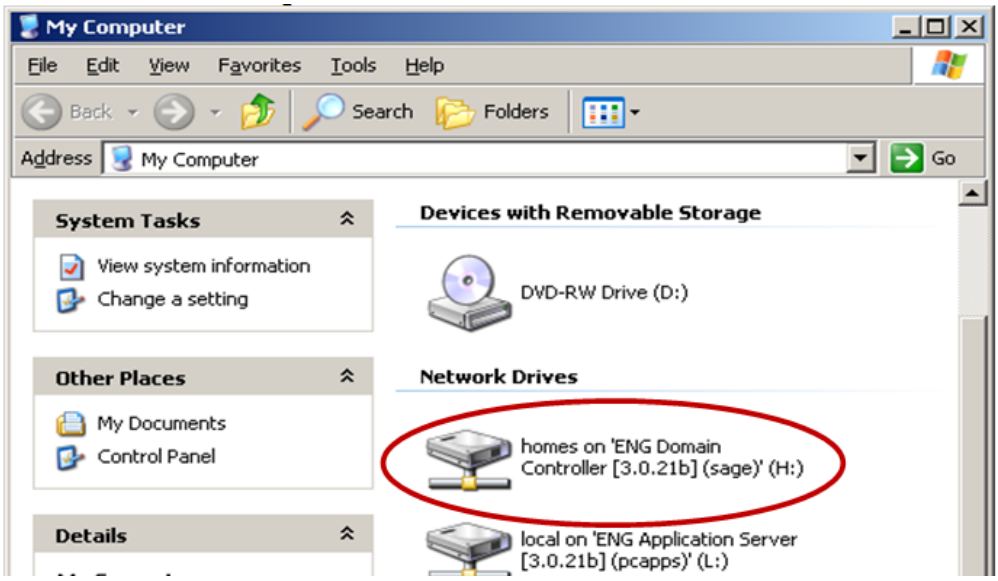
*Your submitted file names(s) must be spelled and cased as instructed. The file extension must be correct, also.* **[-5 points per file for not doing so.]**

***This lab can be done***

- In one of the College of Engineering (EOC) computer labs.
  - You will need an Engineering account.
- Or on your own personal computer
  - You will need to purchase the software.

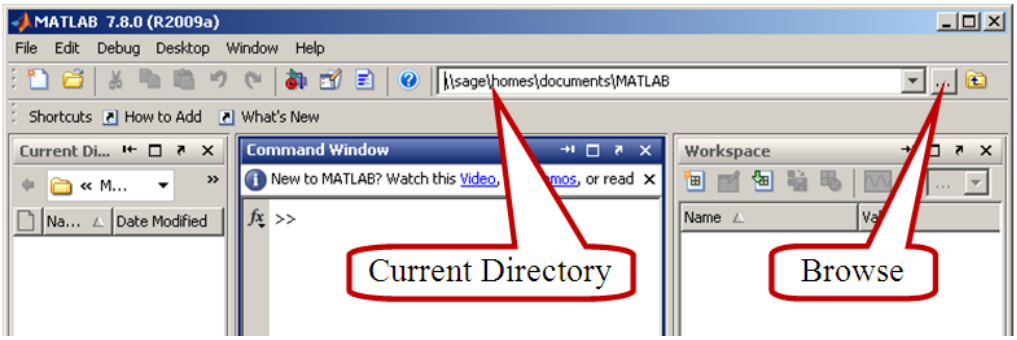
***Create a COMP1200 folder to hold your MATLAB files.***

- If you will be working on an EOC computer, create the **COMP1200** folder on your H: drive. Otherwise, create one on your C: drive or USB drive.
- Inside your **COMP1200** folder, create two folders: **Lectures** and **Assignments.**
- Inside the **Assignments** folder, create a **LAB01** subfolder. Most of your assignments will have more than one file; you will need a subfolder for each assignment.



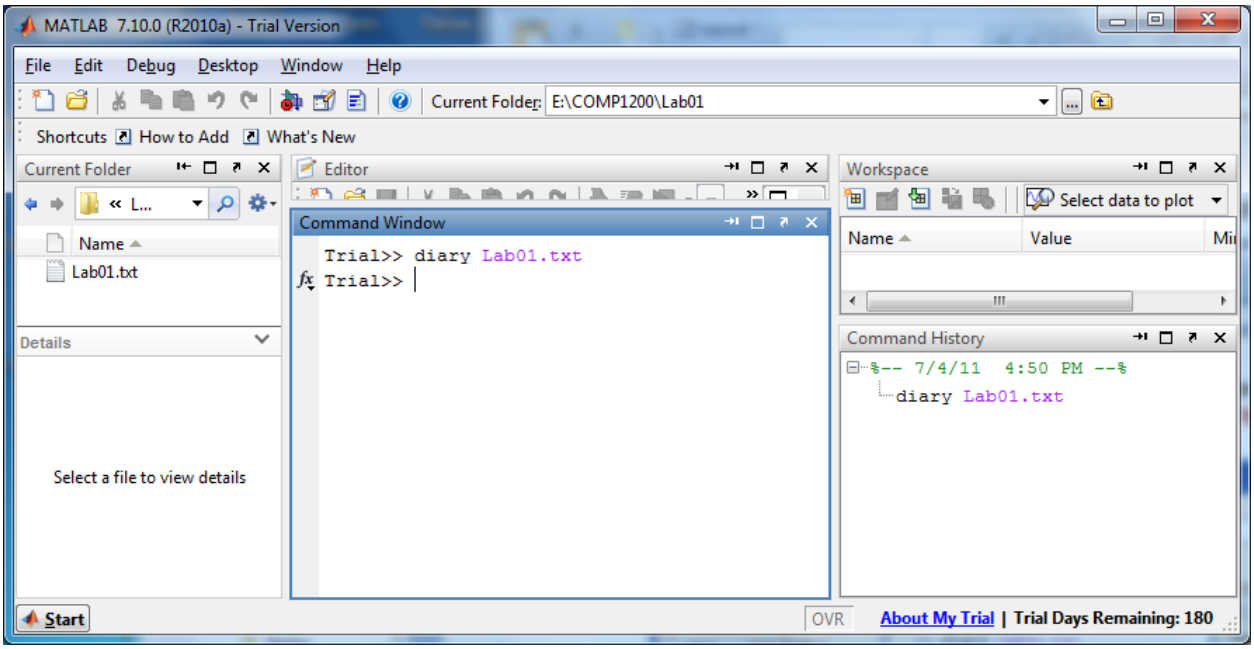

## PART 1. *Start MATLAB.*

- You should see a screen similar to the one below.
- Look at the CURRENT DIRECTORY in the text box on the MATLAB toolbar. Using the … button BROWSE to find you're the **Lab01** folder inside your **COMP1200** folder.



***Create a diary file using the file name* `Lab01.txt`**

- What you do in the **Command Window** during the MATLAB session will be recorded in the diary file.
- To start the diary file, to type `diary Lab01.txt` in the **Command Window** and press ENTER.
- The new file name should now be seen in the **Current Directory** and the command in the **Command History**. **Note: You DO NOT use "Save Workspace As."**




***Lab instructions:***

- Read these instructions carefully!
- You will be asked questions and given instructions.
  Your ITEMs will be typed in the **Command Window.**
  To get started, at the >> prompt, type a **%** symbol and then your response.
  (e.g. % 1. The answer is that you are smart.).
  - The prompt may look differently on the computer that you are using.
    `>>` is the on the university computers
    `EDU>>` is the prompt on the student version.
    `Trial>>` is a prompt that may be in some of my examples

  Press enter to go to the next ITEM.
  - There should be a % with a number and comment to identity each of the 13 ITEMs. (% ITEM 1, % ITEM 2, … % ITEM 13)
- The questions that you need to answer and instructions you need to do are in ***red***.
- You are not expected to complete every step of the assignment without errors on your first try. Therefore, your `Lab01.txt` will contain your correct responses mixed with errors and re-dos. Some may be out of order, so label your ITEMs using the numbered comments clearly.

ITEM 1 Information about variable names:

- Has to start with a letter
- Can be 63 characters or less
- Can be upper or lower case letters, digits, underscore
- Are case sensitive

*What are the other variable rules required by your instructor for variable names?*
This is the **1st ITEM** that will be checked in your diary file.

Next use MATLAB to tell which of the following are valid variable names. **Type** the MATLAB statements exactly as shown. You will get an error message for some telling you that it is not a valid variable name. In a comment statement, write **why** the variable name invalid. Don't just write what the error message says; it does not tell you why it is invalid.

ITEM 2 **Type**: `1Number = 1` *Is* `1Number` *a valid variable name? If it is not valid, tell why it is not.*

ITEM 3 **Type**: `WOW! = 3` *Is* `WOW!` *a valid variable name? If it is not valid, tell why it is not.*

ITEM 4 **Type** the following MATLAB statement with the comma.
Note: you can type them in one at a time or on one command line using commas.
*The 5th thing that will be checked is that you typed this in correctly.*

```
var4 = 0, var5 = 87
```

ITEM 5 ***Type*** *the following as a correct MATLAB arithmetic statement.*
The correct answer for `answer2` is –126.3571.

`answer2 =` $-5\frac{3}{7}+\frac{6}{(12)(7)}-11^2$

Remember to use a numbered comment with each ITEM.

ITEM 6 ***Explain*** *the purpose of putting a semicolon at the end of a command line.*

ITEM 7 **Type** this command: `my_answer = 3 + 7;`
*Did the value still get stored in the variable* `my_answer`*?* ***Explain***.

ITEM 8 *Use* ***help*** *in the Command Window* to find out what "**whos**" is all about. You do this by typing in "**`help`**" and then each command one at a time (e.g. **`help clear`**).

ITEM 9 *The last thing to do is type in your name as a comment statement*.

Now you are ready to save your session by typing the command **`diary off`**
DO NOT . . . I repeat DO NOT go to the "File" menu and click "Save Workspace As…"
This will not save your work, and you will get a 0 for this lab ☹

When you are finished with Lab 01, close MATLAB.
This lab may seem trivial, but it gets you started and on the road to bigger and better things.

# The following are some helpful facts to test out

*This page is for your information and not part of the assignment that is submitted.*

- **Smart Recall -** type the first few letters of a command that you have used and then push the (up arrow) and it will bring up the commands that you have used that start with those letters.
- Type the first few letters of a command and push **TAB** and it brings up the word that was used that starts with those letters. If there is more then one word that starts with those letters then nothing happens. Push **TAB** again and it gives a list of the words.
- To scroll a list of all the commands used just use the ↑ (up arrow) or the ↓ (down arrow)
- To move backwards or forwards a character at a time on a command line use ← or → (right or left arrows)
- To move backwards or forwards a word at a time on a command line press **Ctrl** and at the same time as you press either the right or left buttons.
- You can use **Home** and **End** to go to the beginning or end of a line.
- You know what **Delete** and **Backspace** do. So to add to those, if you press **Esc,** it will clear the whole line or **Ctrl k** will clear to the end of the line.
- Type any variable name and it will give you the value that is stored for that variable.
- Type **who** and it shows all the variables that are being used.
- If you type **clear** and a variable name, it will clear the value for that variable. If you type just **clear** by itself, it clears all the variables.
- If you want to type some comment lines, you must type **%** first then the line will be ignored by the program

❋ ❋ ❋ ❋

Computer programming is not a spectators sport!

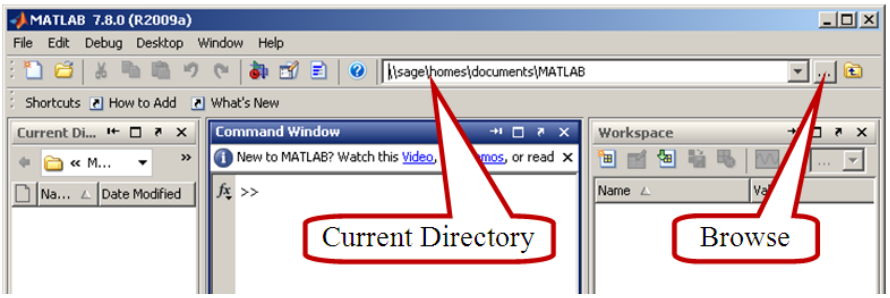
Learning to use a programming language requires time and hands on experience.

You will benefit greatly from typing examples from the text and class discussion into MATLAB and observing how they work.

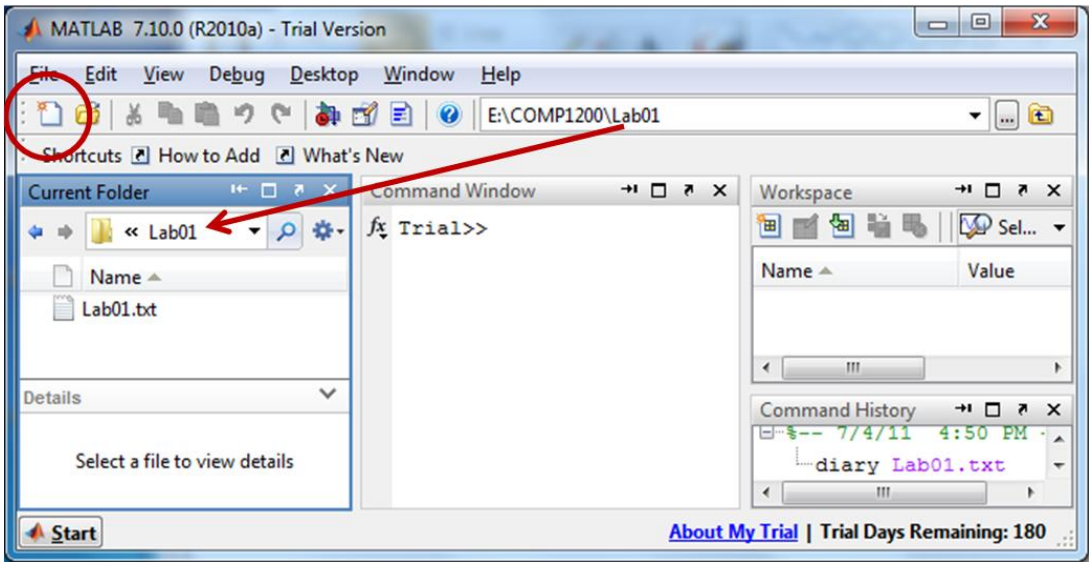
Mistakes are not a bad thing. You will benefit from making mistakes and correcting them.

# PART 2. *Start MATLAB.*

- You should see a screen similar to the one below.
- Look at the CURRENT DIRECTORY in the text box on the MATLAB toolbar. Using the … button BROWSE to find the **LAB01** folder in your **COMP1200** folder.

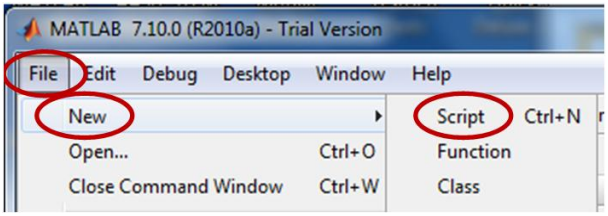



- Once you select your `Lab01` folder as the **Current Directory**, you will see Lab01 in the path name box at the top of the **Current Folder** window and the name of your `Lab01.txt` file below it.

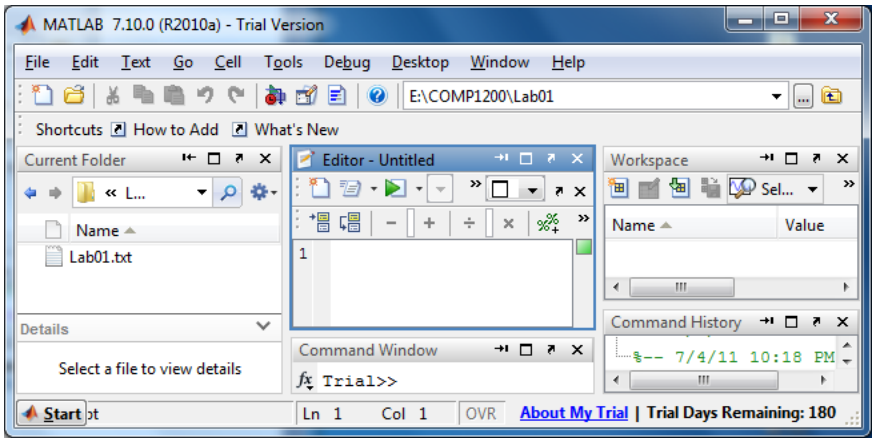



***Create a m-script file using the file name* `Lab01.m`**

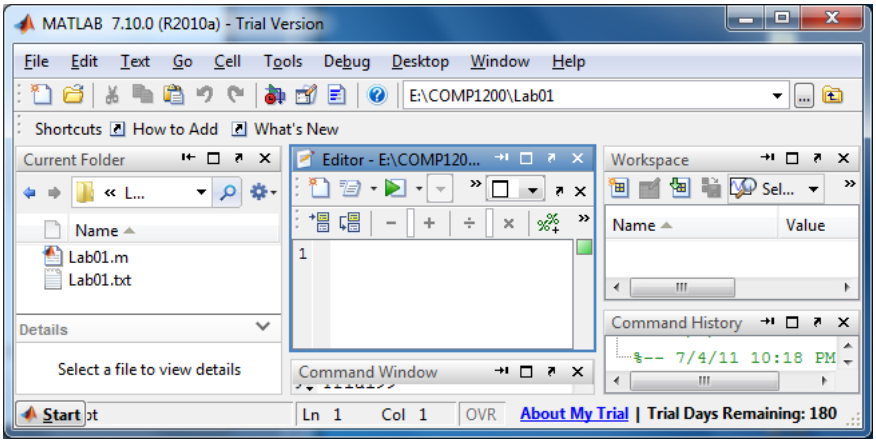
- A m-script file is a MATLAB program file. It allows you to type and save MATLAB statements AND rerun and/or edit them at a later time.
- Use one of the following to open a blank m-script file:
  - Click on the **New Script icon**. See above.
  - Use **File / New / Script** on the menu bar. See below.



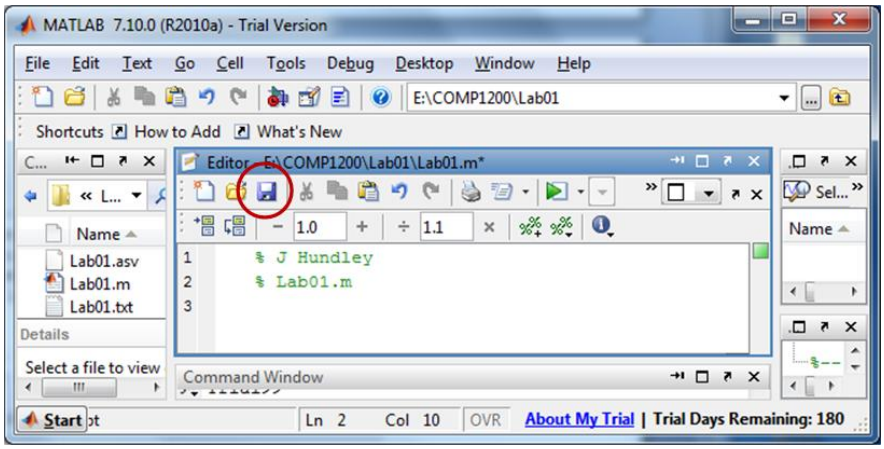
- The **Editor** window appears above the **Command Window** where MATLAB statements are typed.
- Use **File / Save As…** to save Lab01 into the **Current Directory**. The m-script file will have a **.m** extension. **Untitled** will be replaced with the path to **Lab01.m**.




- Lab01.m is shown in the **Current Folder** window.



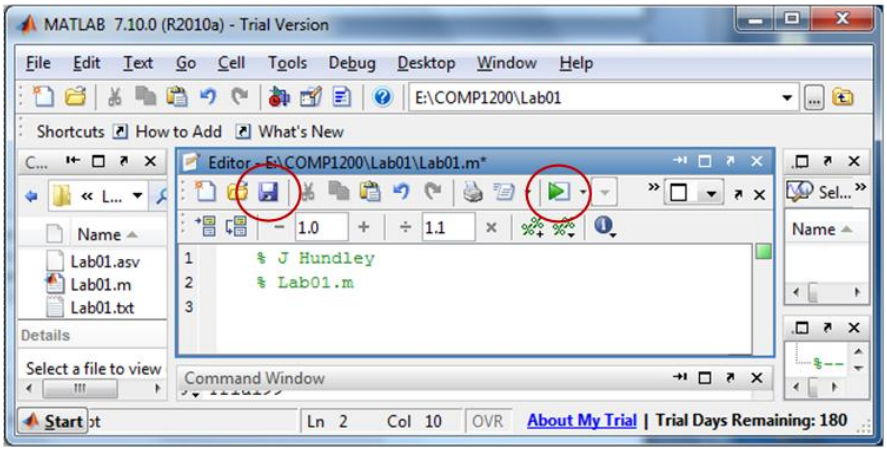

- Start typing the program below in the **Editor**.
- Click the **Save icon** often to prevent loss of work.



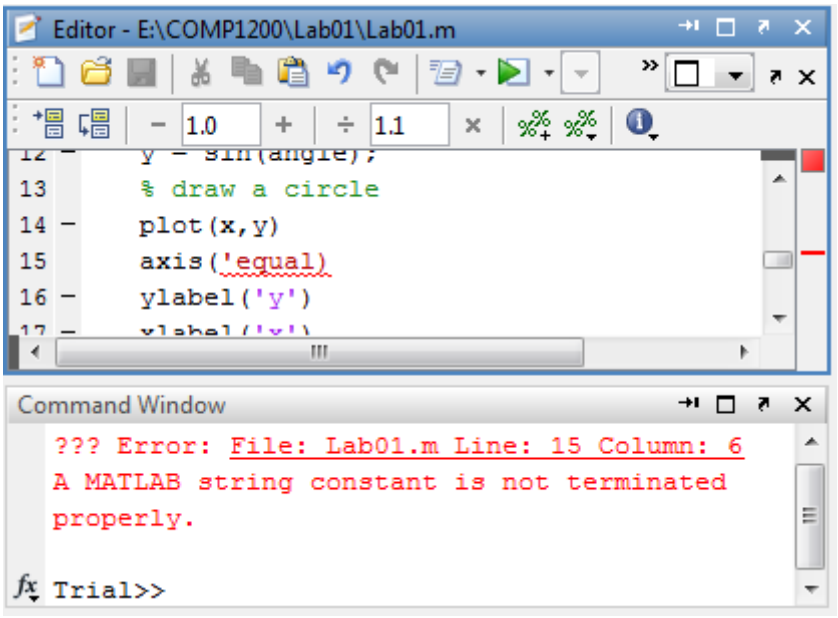
- Where there are CAPS type the requested information. Enter the rest of the program below **exactly as is**, observing the column restrictions and including the comment and blank lines. The program prints
    - Don't forget the semicolons to prevent assignments statements from printing the values.
    - Notice that some words change color as you type. These are **comments**, **string constants**, and **keywords**.

```
% TYPE YOUR NAME HERE
% Lab01.m
% COMP1200-M – TYPE CURRENT THE SEMESTER AND YEAR HERE
% CIRCLE - A script file to draw a pretty circle

clc, clear all

% build vecters
angle = linspace(0, 2*pi, 360);
x = cos(angle);
y = sin(angle);

% draw a circle
plot(x,y)
axis('equal')
ylabel('y')
xlabel('x')
title('Pretty Circle')
grid on

% print message
disp('Congratulations!');
```

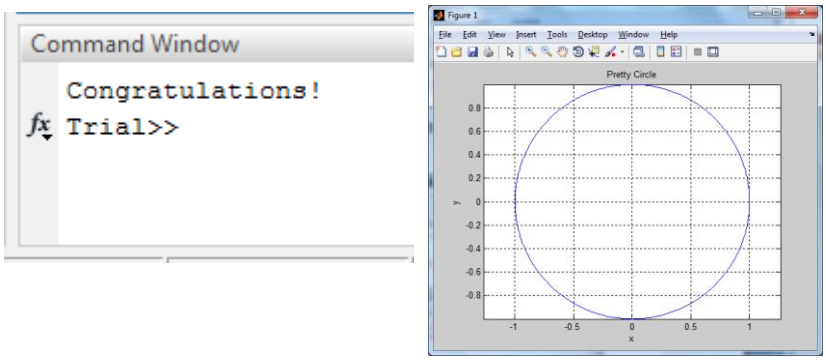
- You can type and run this program without know MATLAB. You will see these commands and functions again.
- When you are finished typing the program,
    - **Save and Run** the program by clicking the **green arrow** at the top of the **Editor** window.




- If **error messages** appear in the **Command Window**, correct the errors and run again.
    - Use the program above to check your work.




- When the program runs correctly, you will see "Congratulations!" in the Command Window and a graph will be in a Figure window.




***Submit via Blackboard:***

| | | |
|---|---|---|
| `Lab01.txt` | diary file | A readable text file containing MATLAB statements. **Cannot** be use to rerun the MATLAB statements. |
| `Lab01.m` | .m script file | Stores the MATLAB statements. **Can** be used to rerun the MATLAB statements |

*Your submitted file name(s) must be spelled and cased as instructed. The extension must be correct, also.*
**[-5 points per file for not doing so.]**