

# A121 Lab 1: Intro to MATLAB

Monday, January 30, 2012

Due Friday, February 3, 2012

## Procedure

The labs this semester will require the use of MATLAB for number-crunching, data processing, plotting, image manipulation, etc. Today's lab is intended to familiarize (or remind) you of the basics of using MATLAB. You will be looking through some tutorial links provided at <http://www.astro.umd.edu/~cychen/MATLAB/ASTR121/>. You will use the information in those pages to then complete the following questions and exercises.

- 1) On the desktop, find and open the "A121" folder. Create a new folder within, and name it using the initials of each lab partner, and the number 1, since this is the first lab.
- 2) Open MATLAB, and change your current directory to the folder you just created. You can either do this using the menu options, or with the command "cd yourdirectory", without the quotes, where 'yourdirectory' is the path to the folder you created (which is C:\Users\Student\Desktop\A121\yourinitials).
- 3) Go to the above website, and click on the link for "Lab01: Introduction to Matlab". On this page, the first link is just a copy of this handout you are reading, so ignore it. Read through the rest of the links on the page, and then answer the questions and complete the exercises in the next part of this handout. (NOTE: You needn't follow the "Next Topic" links at the bottom of the Math 206 tutorial pages.)

## Questions and Exercises

- 1) Why does one put a semi-colon at the end of a MATLAB command?
- 2) What is the purpose of the "hold on" command?
- 3) Create a script m-file (and save it - name it whatever you like) that does all of the following (in order) in one script:
  - a) Create an array with the numbers 1 4 7 in the first row and 3 5 8 in the second row, using the semi-colon to split the rows.
  - b) Create an array that runs from 10 to 50, with an increment of 0.1, using the colon operator. Remember to suppress the output.
  - c) Create an array that runs from 10 to 50 with 1900 equally spaced points, using "linspace". Remember to suppress the output.

- d) Create an array that is the solution to the equation  $5*\cos(x)$ , where  $x$  is the array you created in part b. Again, suppress the output.
- e) Create an array that is the solution to the equation  $3*\sin^2(y)$ , where  $y$  is the array you created in part c. Remember, you need to do something to prevent MATLAB from attempting to do matrix math. Also, you should suppress the output.
- f) Use “plot” to create a single plot which shows both the solution to part d in a blue solid line and the solution to part e in a black dashdot line.

4) Execute your script m-file, and print out your plot - It won't print in color, but that's OK. Make sure you print 2 copies of the plot, so you and your partner both have a copy to turn in. Now add to your m-file the code to repeat part f above, but this time reverse the direction of the x-axis. Remember to clear the figure space first!

Execute your script m-file again, and print out 2 copies of the new plot from part 4. Also print out a copy of your script m-file for each partner to turn in. Staple the plots and m-file to this page, which has your answers to questions 1 and 2, and don't forget to put your name on it!