CISC106 Fall 2009 Lab01

- Review the code examples from your notes in class.
- Some programs below are associated with a question. **Answer the questions** using comments below your code in the m-file.
- You may work with one or two other people on your lab (max size is three!). These people must be in your same lab section. If you do, you must each submit separately to Sakai, but only submit one paper copy to your TA. All of your names should appear on code that you develop together¹.
- All students must be able to use the SunRays. If you can figure out how to work from home, that's fine, but **your code must run on Strauss** when you make your diary files.
- The office hours of the TAs and the instructor are on the class website. Visit us!

Problems

1. Open Matlab on Strauss at your SunRay terminal. Write the file circleArea.m as we did in class. Don't forget the contract, description, and examples - we grade them. If you can't get it right from your notes, look at the example online, but do this as a last resort - you'll learn less by looking at my version.

Make a diary file (lab01.1.txt) showing your example tests run in the interpreter.

- 2. For this problem, you will create directories in your Unix account and move files around, and then show that you did so and draw a picture of what you did.
 - (a) Make two new directories (some systems call them "folders") in your home directory on Strauss: lab00 and lab01. To do this, open an xterm on Strauss from the menu, then use the mkdir command as shown in your Unix text. Are there other ways to create directories? Yes, but this one will be on the exam. :)
 - (b) Review mv, ls, and cd in your Unix text. Then use the mv command, as described below, to relocate the m-files and text files you have made in previous labs. For example, "circleArea.m" is in your home directory. You can verify this by typing in the shell²:

> ls

to list all the files. Sometimes there are too many to easily see. In this case, you can use a "wildcard" character. Try this:

> ls *.m

This will show any files in this directory that end in ".m". Similarly, typing "ls c*" will show all files starting with the letter c.

(c) Now that you have verified that "circleArea.m" is in your home directory, move it to your new lab01 directory:

mv circleArea.m lab01/

¹If you would like to work with someone but don't know whom, your TA may be able to help connect you to other students looking for lab partners.

²The shell is the Unix shell or terminal window, a place to type Unix commands. Many Unix commands can be typed in the MATLAB interpreter window as well, but not all; be sure you know which is which!

- (d) Now use the cd command to change into the lab01 directory and verify that your file is there (what command will you use?). Then go back up a directory level (use "cd ..") and finish relocating your lab files.
- (e) When you are done moving files, make a single diary file in Matlab: starting in your home directory, change into each of the directories you created and show the listing of the files there. Then end the diary. NOTE: never edit a diary file, not even to "fix" mistakes. A diary file is a record of your session, and modifying it is a violation of the Academic Honesty policy. If your diary session gets too messy, just start over.
- (f) After you print your diary file, draw a directory tree showing your home directory at the top, the lab directories in the next level down, and the lab files below that. Be tidy, and include this drawing when you hand in the paper version of your lab.
- 3. Write a new function file **sumThreeNums.m** in your lab01 directory that takes three parameters and returns the sum. Show the testing of your examples in a diary file.
- 4. Write a new function file **absoluteValue.m** in your lab01 directory that computes the absolute value of its parameter (a parameter is the number we pass in). For this you'll need the conditional structure **if**. Look it up in your MATLAB textbook and identify the pieces you will need in your program. Try playing with **if** in the interpreter. If you cannot get it to work, show your example to your TA along with your textbook (why?) and your interpreter screen.

After playing with **if** in the interpreter, you're ready to write your function. I suggest you write the examples first. In the description section, use words (e.g. "if") to describe what the function will do. Then carry out the description in the body of the function.

MATLAB has a built-in function for computing absolute value, but **do not** use it here. As a rule, when asked to write a function you should never use the built-in version³.

5. Enter your lab01 directory (how?). Copy the file sumThreeNumsTest.m from the class website's lab directory by using a Unix command (more practice!) in a shell (your xterm on Strauss is a shell):

cp /www/htdocs/CIS/106/jatlas/09F/labs/sumThreeNumsTest.m .

The dot at the end means "the directory I am in now" so that is where the file is being copied to. You could also say:

cp /www/htdocs/CIS/106/jatlas/09F/labs/sumThreeNumsTest.m ~/lab01/

See your Unix text for more information.

Now run the code by calling the function from the Matlab command line (Are you in the right directory? How do you find out?). **Use assignment** to store the value that the function returns to the interpreter.

What does the function do? Rewrite the comments for sumThreeNumsTest.m so that they match the code. You won't need examples here (why not?). Are the tests satisfactory? If not, make them better. Submit the m-file and a diary showing it run in the interpreter.

³Why do you think we ask you to write functions that MATLAB already has?

6. Write a function file absoluteValueTest.m that automates the testing of your absolute value function. It does not need examples. You may use as comparison the MATLAB function for absolute value or use hard-coded numbers. Try to write your function without looking at the sumThreeNumsTest code, but look if you need to. Working hard on writing simple code now will pay off later when you don't have models easily accessible.

Did you read all the instructions at the top?

Be sure that you have a printed copy of your five function M-files, six diary files and a drawing. All must be stapled together, with your name and lab section on the top page. Be sure that you upload a copy of all the MATLAB files to Sakai. Then, click submit ONLY ONCE to send these to your Sakai and your TA.

Paper copies go to your TA, not your professor. Your TA may give you special instructions, or may just have you put them in the appropriate box in the TA office (103 Smith).

On the first page of every printed lab for this course, your name(s), section, and TA's name must appear.