## CISC106 Fall 2009 Lab02

- 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 don't need to write answers to questions in parentheses those are questions that you should think about and answer for yourself.
- 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 in class. All of your names should appear on code that you develop together<sup>1</sup>.
- 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. The function sphereVolume() takes a radius as a parameter and returns the volume of a sphere  $(volume = 4/3 \ \pi r^3)$ . Write a test function named sphereVolumeTest() that takes no parameters and tests the sphere volume function. Then write sphereVolume(). Show your test file running in a diary.
- 2. Write a function M-file using the relational operators from class and the text (<, >, <=, etc) with an **if** statement. The function will use **fprintf** (from chapter 2.2) to show a text message saying whether the parameter, n, is ten or less; greater than ten but less than twenty; twenty or greater but less than thirty; or thirty or greater. Demonstrate each of your function's examples in a diary file.
- 3. Copy the function m-file listOfStars.m and indentSpaces.m from the lab directory (see the last lab if you forget how). Try both functions out. Write the function drawTriangle that takes two parameters and draws a triangle of asterisks *using the listOfStars and indentSpaces functions*.. Just as listOfStars uses a function to draw each asterisk, drawTriangle will use indentSpaces and listOfStars to draw each row. Use only techniques we have used in class<sup>2</sup>.

```
>> drawTriangle(4, 0)
******
****
***
*
***
*
>> drawTriangle(3, 2)
****
*
*
*
```

Hint: use the structure of listOfStars as a model for drawTriangle. The first row of stars in the first example contains 4 \* 2 - 1 = 7 stars. Demonstrate all examples from your m-file in a diary file.

<sup>&</sup>lt;sup>1</sup>If 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.

<sup>&</sup>lt;sup>2</sup>Do not use any loops if you wish to receive credit.

4. Read sections 2 - 2.3 in your Matlab text. Practice using the quizzes provided (the answers are in the back). Then start a diary file and demonstrate the creation of the following named matrices

```
a = 1 \quad 2 \quad 3

b = 1 \quad 3 \quad 5 \quad \text{(use interval notation)}

c = \begin{array}{rrrr} 1 \quad 2 \quad 3 \quad 4 \\ 3 \quad 4 \quad 5 \quad 6 \end{array}

d = 0 \quad 0 \quad 0 \quad 0 \quad \text{use a function to create this one}

at, \text{ set to the transpose of a}
```

5. At a Matlab command line, type the expression 0.3 - 0.2 - 0.1 to see the result. Are you surprised? Use the fprintf function from Chapter 2.6 (Displaying Output Data) to examine each of the numbers involved. Change width and precision fields of the format specifier as described in the chapter, so that you can see the numbers with great precision. Once you have learned how to use fprintf to do this, start a diary file and show high precision versions of all the tenths from 0.1 to 1.0. Each should print on a separate line.

Did you read all the instructions at the top?

Be sure that you have a printed copy of your three function M-files and five diary files. 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 are due in class on Friday September 25. If you must turn in your assignment late, place the paper copy in the box for your section in Smith 103.

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