

When you have completed the exercise, show this sheet and any associated programs to your discussion instructor, who will record that you have completed the work. If you do not finish this exercise during class, you have until *Sunday, 1/26, at 9pm* to get your exercise checked off during *consulting hours* or during *TA office hours* (not professor office hours).

If you have any questions, **ask** your discussion instructor or a consultant immediately! They are in the lab to help you learn the material.

## 1 MATLAB built-in functions... fun with MATLAB

MATLAB provides numerous built-in variables and functions. For each line below, type the text in the *Command Window* and press *<Enter>* to see what happens. Is the result what you expect? Fill in the blanks below with the screen output for that line.

```
% This is a comment--no action is executed by the computer

% From this point on, read but do not type the text after the % symbol in a line.

% Variables, constants, and simple calculations:
a= 100 % Look at the Workspace Pane: a VARIABLE called a has been created
a= 101 % Look at the variable's value in the Workspace Pane
b= 99
format compact
a/b % -----
ans
y= ans % -----
format long
y
format short
y
p=(3*2)^2
q=(3*2)^2; % Did you type the semi-colon? Look at the Workspace Pane: q is
           % created but its value is not shown in the Command Window.

x = 2; y = x^x; z = y^y % -----
format loose

% Built-in functions:
sqrt(x)
pi % a built-in variable
cos(pi) % -----
abs(ans)
abs(cos(pi)) % -----
exp(ans)
rem(5,2) % What does function rem do? If you're not sure, try a few more
         % examples: rem(9,7), rem(10,6), ... -----
rand % Generate one random number in the range of (0,1)
help rand
lookfor magic % MATLAB searches its documentation for the keyword 'magic'
              % Wait a few seconds. If this command takes too long to
              % complete, press <Ctrl><c> to make it stop.
```

## 2 Running and editing a MATLAB program

Set up your flash drive (or cloud storage or other storage device) to organize all the files that you will write in the course. See the announcement “file storage” on the course website for more info.

From the course website (<http://www.cs.cornell.edu/courses/cs1112>), download the file `spiral.m` from the *Exercises* page to the folder that you will use for storing your Exercise 1 files, e.g., `cs1112\exercise\ex1\`. The easiest way is to *right-click* on the file name, select *save link as . . .*, and browse to your folder. *Make sure that the file name remains spiral.m without any space and parentheses.* If your machine has added any extra characters to the file name, e.g., `spiral (1).m`, after saving the file you must *change the name to be without any space and parentheses before you open/run the file in MATLAB.*

Now in MATLAB set the *Current Directory* to be the directory in which you have stored your file `spiral.m`. You should now see the file listed in the *Current Directory Pane*.

To run the program (script) `spiral`, in the *Command Window* type the file name without the extension `.m`. What do you see on the screen?

To read the program, open the program file in the *Editor Window*: select menu options *File*→*Open* and then select or type the file name `spiral.m`. (Or in the *Current Directory Pane* double click on the file name.)

Now experiment with the program!

1. Change the value of `turnAngle` from 100 to 137. Save the program and run it to see what happens. Try other values for `turnAngle`. What does the *variable* `turnAngle` represent (or control) in the program?  
\_\_\_\_\_
2. Now change the value of `numEdges` and run the program again. Try again with another value. What does *variable* `numEdges` represent? \_\_\_\_\_
3. Which variable controls the color of the spiral? \_\_\_\_\_  
Now change the color.

### 3 Temperature conversion (modified from *Insight M1.1.3*)

Download the file `convertCel2Fah.m` from the Exercises page and save it to your folder Read and run the program. Let's change the presentation of the result by modifying the last statement in the program:

1. Change the *substitution sequence* from `%.3f` to `%.8f`. The substitution sequence is also called the *format sequence*. Save and run the program again and notice that the format of the number printed has changed. What does the substitution sequence `%.8f` specify? \_\_\_\_\_
2. Say, you want to use 10 character spaces for printing the entire value (including the decimal point) with 2 decimal places shown. You will then use the substitution sequence `%10.2f`. Again, make this change and observe the print format.

Now save the file as `convertFah2Cel.m` and then modify it to prompt the user for a temperature in degrees Fahrenheit and convert and print the temperature in Celsius. Modify the `fprintf` statement to print the result to one decimal place. Test your program a few times using different input values. (You can check the answers using a search engine.)

### 4 CS1112 course web page <http://www.cs.cornell.edu/courses/cs1112/>

1. Where are the reading assignments listed? \_\_\_\_\_
2. What does the CS1112 AI policy say about code found on the Internet? \_\_\_\_\_
3. Can you use the office hour of a TA who is *not* your discussion instructor? \_\_\_\_\_
4. How do you indicate that you work with a partner on a project? (See CMS link) \_\_\_\_\_

### 5 CMS: Course Management System

You will use CMS to submit programming projects and to view your scores and grading comments. Try to log on CMS now. If CS1112 is *not* listed as one of your courses, ask your section instructor to add you to CMS. Note that your *projects must be submitted through CMS.*