

CS1112-206/211/212–Fall 2009

Lab 1 Solution

Friday, September 4

1 MATLAB Built-In Functions... Fun with MATLAB

Answers and comments are interleaved in the following code on separate lines that begin with %%%%.

```
% 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
b= 99 % Look at the Workspace Pane: a VARIABLE called b has been created
format compact
%%%%% format compact will not print blank lines when displaying outputs
a/b % -----
%%%%% 1.0101, the result of a/b=100/99
ans
y= ans % -----
%%%%% 1.0101, the value of y
format long
%%%%% format long displays a number with (roughly) 15 decimal places
y
format short
%%%%% format short displays a number with (roughly) 5 decimal places
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.
%%%%% A semicolon at the end of a statement is to suppress the output of that
% statement in the Command Window, but the statement is still executed and
% the result stored (quietly), as shown in the Workspace Pane.

x = 2; y = x^x; z = y^y % -----
%%%%% 256
format loose
%%%%% format loose prints extra blank lines when displaying in the Command Window

% Built-in functions:
sqrt(x)
pi % a built-in variable
cos(pi) % -----
%%%%% -1
abs(ans)
abs(cos(pi)) % -----
%%%%% 1, the absolute value of 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), ... -----
%%%%% rem(a,b) finds the remainder when dividing a by b. What happens if one
%      (or both) of a and b are negative?
rand(1) % Generate one random number in the range of (0,1)
help rand
%%%%% This pulls up the documentation on function 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

Note on *Current Directory*: This is where MATLAB will look for files. It is displayed at the top of the MATLAB window. Change it as necessary to make sure that the directory displayed contains the file(s) you want to run.

1. `turnAngle` controls the angle the line makes for each turn. In other words, it specifies how much a line should deviate from its course to form a vertex of the spiral.
2. `numEdges` represents the number of edges, or sides, in the spiral.
3. `myColor` controls the color of the spiral.
4. After changing `%d` to `%f`, decimal digits appear for `numEdges`. That is, `%d` will display a number without decimal places (it stands for *decimal*, which means a number in base 10), and `%f` will display a number with (roughly 6) decimal places (it stands for *float*—think about it as “floating” around, not fixed at a certain integer).
5. `%.2f` specifies the number of decimal digits after the decimal point. In this case, there are two decimal digits being displayed.
6. This “question” is self-contained, but let’s reiterate here that `%10.2f` reserves ten spaces for this number and displays the number in this “box,” right-aligned. So, if the number is 700, there will be 4 blanks before 700.00: `700.00`. The decimal point and decimal digits count.

3 CS1112 Course Webpage

Most answers are taken directly from the course webpage without modification.

1. (from AEW section) The *Academic Excellence Workshop (AEW)* offers an opportunity for students to gain additional experience with CS1112 course concepts in a cooperative learning environment. The time commitment is two hours per week in the lab—no homework will be given.

2. The reading assignments are listed under the *Schedule and Lecture Materials* part of the *Syllabus* section. A shortcut is the *Lecture Materials* on the menu column.
3. (from Academic Integrity section) You may not copy code found on the internet and submit it as your work, unless the code is specifically given as part of the assignment.
4. (from Staff section) You can use *any* TA's office hours, not just those offered by your section instructor.
5. (from Staff section) Consulting takes place in the ACCEL Green Room on the second floor of the Engineering Library in Carpenter Hall.
6. (from CMS section) If you work with a partner, click the groups button to register your group *before* submitting files. Enter your partner's NetID. Click Invite. Now your partner must log on CMS and accept your invitation. Then *either* partner can submit the files as described in the previous steps.