LAB #5
Python Loops Using Turtle Graphics

1. In this course, all our labs involve paired programming. You do not have to keep the same partner for each lab, but you MUST work with someone in each lab, as specified in the student handout.

2. At this time, you need to pair with someone in the lab, and finish the rest of the lab as a pair.

Practice: Loops in Python (2 pts)

3. Now, describe how your buoyancy program would change if you asked the user if he/she wants to re-calculate the force for another object? Modify your buoyance program so that the user must enter a 1 to continue or 0 to quit.

   Suppose you wanted to provide a message to the user that she/he entered an invalid number when the number is not a 1 or 0. For instance, if the user enters a number other than 1 or 0, then the program must give an error message and re-prompt the user for a 1 or 0 to continue or quit. What if the user entered characters or something not a number? Write down your design for changing the program to allow for this feature.

Setting Up Python Turtle Graphics (4 pts)

4. Now, we are going to learn to read Python documentation to create a graphical program using the turtle library. http://docs.python.org/2/library/turtle.html

   Another resource is: http://openbookproject.net/thinkcs/python/english3e/hello_little_turtles.html

   You can also use your book as a resource. The turtle graphics is in Chap. 6.2.

First, export the ENGR display to your machine...

In order to see things displayed on the ENGR server, you have to export your display to your local machine. Below are the instructions for Windows and Linux.

Windows: http://engineering.oregonstate.edu/computing/personal/134

In order to do this, you have to install an X server: Xming-6-9-0-31-setup.exe

Launch the Xming server, and choose to have multiple (or one) windows. If you choose multiple windows, nothing will happen, but the X server will be running.
Then you have to open Putty, load your engr settings, and now go to the Connection -> SSH -> X11 and click on the Enable X11 forwarding checkbox. Now, connect to engr. (You might want to save this preference!!).

Try running xeyes or xclock in your terminal/Putty to test that it’s working

**Linux/Mac:**
When you ssh to ENGR, use ssh –Y, and this will setup the X11 forwarding.

**Using Turtle...**

Practice writing some of the examples in the documentation. You must have these following statements in your program, as a bare minimum.

```python
import turtle        #bring in the turtle library
window = turtle.Screen()  #create a variable for the window
my_turtle = turtle.Turtle() #create a variable for your turtle
window.mainloop()    #wait for the user to close the window
```

Now play with changing the background color of the screen, the shape and color of your turtle and pen, and learn how to move the turtle around the screen.

**More Python Turtle Graphics (4 pts)**

5. Use *for* loops to make a turtle draw these regular polygons (regular means all sides the same lengths, all angles the same):

   a. An equilateral triangle
   b. A square
   c. A hexagon (six sides)
   d. An octagon (eight sides)

Make sure you sign-up with a TA for demoing/explaining your Assignment #4 next week. This is how all assignments are graded in the course, and if you sign-up and do not make your appointment without rescheduling, then you will be penalized 50 points!!!