Intro. to Computing (810:051) **Lab 5** **Name:_____**

Objectives:

- Practice top-down design and implementation with functions

In this lab you will be asked to write two programs. Each program should be in its own .py file and formatted like the sphere.py program from lab 4, i.e., a main function at the top with other function definitions below it, and a call to the main function at the bottom of the file.

```
"""
File:  sphere.py ...
"""
def main():
      ...

def sphereCircumference(...

def sphereSurface(...

def sphereVolume(...

# call to main
main()
```

For each program, don't start by writing code, but instead:

- determine a sample user interaction with the running program
- determine subproblems that can be implemented as separate functions

Part A: Design and implement a program that simulates flipping a coin 100 times, and keeps a count of how many of thoses flips are heads and how many of thoses flips are tails. (Hint: use random.randint to generate a either 1 or 2 with 1 corresponding to a head and 2 corresponding to a tail.)

Display appropriate output to report the result.

After you have your program working correctly ("debugged your program"), raise your hand and demonstrate your program.

Part B: Design and implement a program that gives a simple math quiz for addition. The program should iterate through 5 addition problems with randomly generated integers between 100 and 999. Each problem should be well formatted such as:

```
   362
 + 175
 --------
```

After the student answers a question, your program should display either a congratulations message for correct answers or a message showing the correct answer. After the quiz, your program should display the total number of correct and incorrect answers.

After you have your program working correctly ("debugged your program"), raise your hand and demonstrate your program.

If you complete all parts of the lab, nothing needs to be turned in for this lab. If you do not get done today, then show me the completed lab in next week's lab period.
Make sure that you log off the computer before you leave.