

CMPS 150 – Lab 11

The following is an exercise in working with Python functions. When done, be sure your Python source code runs properly and upload your completed lab to your TA on Moodle.

1. Copy/Save the lab source code file for today from the Moodle Lecture Site

Look for the files for today “**lab11.py**” AND “**lab11_input.py**” and save the files to your machine.

2. Launch IDLE.

3. Edit the first two lines of the code to have **YOUR** name/id/section.

```
# Author:          Your-Name
# ULID/Section:    Your-ULID & lecture section-number go here
```

4. Add functions to perform several tasks, returning all results to main to be printed.

This lab will compute areas and volume of geometric objects. Data for dimensions will be in a data file. The file will contain an unknown amount of data, therefore you must use a sentinel-controlled while loop to process the data. Each “set” of data will consist of the following: a string on a line by itself (indicating the type of calculation to be performed), then numeric(s) on the following line that are needed to perform that type of calculation.

The types of calculations are:

- | | |
|----------------------------------|--------|
| • AC – area of a circle | radius |
| • VS – volume of a sphere | radius |
| • SAC – surface area of a cube | length |
| • SAS – surface area of a sphere | radius |

Listed to the right of each type of calculation above is the type of dimension used for this type of calculation.

You must write functions for each of these calculations.

You must read data in the main function and pass appropriate the dimension to each of the functions.

```
AC
7.5
SAC
4
SAS
24
VS
8.6
SAC
10.5
###
0
```

Since this is a sentinel-controlled loop, you must have a sentinel value to indicate when the loop must end. The sentinel value is when the string for type of calculation is “###”. A sample input file can be seen at above/right.

REMEMBER: Your program must run properly for ANY number of “sets” of data.

- Area Calculations
 - Circle = $PI * radius * radius$
- Volume Calculations
 - Sphere = $4/3 * PI * radius * radius * radius$
- Surface Area Calculations
 - Cube = $6 * length * length$
 - Sphere = $4 * PI * radius * radius$

5. When you have edited and reviewed the code, save the file, and run your code.

6. Debug your code (perhaps you can skip this step).

If you have any errors in your code, the interpreter will produce an error, with a line number, where it detects there is a problem with your code. Return to the editor and correct the error. Run it through the interpreter again (step 5) until it runs with no errors.

7. Sample Run

Area of a Circle	176.71
Surface Area of a Cube	96.00
Surface Area of a Sphere	7238.23
Volume of a Sphere	2664.31
Surface Area of a Cube	661.50

8. Exit Python

Close the Python IDLE editor.

Close the Python IDLE shell.

9. Upload to Moodle

Get in a browser and login to Moodle.

Go to your submission section on the Moodle site.

Here you will see the submission link for lab today. Click on the link for Lab #11.

Click to “Add a Submission” then “Upload a File”

Select to “Choose a File” and go about the process of browsing/finding “lab11.py” on the computer

Select to “Upload this File”

When returned to the Upload screen, MAKE SURE to click on the “Save Changes” button.

You will be returned to the “Lab #11” screen. This time you should see your source code file listed on it.

10. Logout of Moodle