

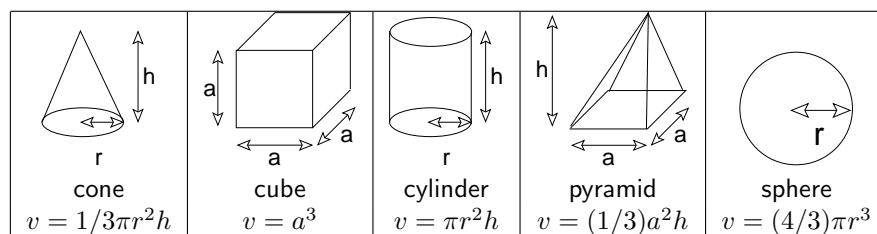
CIS 1.5 Fall 2009 Homework III

Overview

- This is the third homework assignment for CIS 1.5.
- The entire assignment will be worth 10 points, that is 10% of your semester grade.
- **It is due by midnight on Friday October 23rd** and must be submitted by email (as below).
- **Follow these emailing instructions:**
 1. Create a mail message addressed to *parsons@sci.brooklyn.cuny.edu* with the subject line **CIS 1.5 HW3**.
 2. Write your name, that is the name under which you registered for the course, in the email (when I get an email from *deathmetal@aol.com* or *pinkprincess@yahoo.com*, I can usually guess whose program it is, but that is not as good as *knowing* whose program it is).
 3. Attach **ONLY** the **.cpp** file as I tell you below. (For this homework you will work on a single program, adding lots of things to it.)
 4. Use a **zip** utility to bundle all your files together and send them as **ONE** attachment to the email.
on a PC: use **WinZip**
on a Mac: use **File - Create Archive...**
on Linux: use **zip**
 5. Failure to follow these instructions will result in points being taken away from your grade. The number of points will be in proportion to the extent to which you did not follow instructions. . . (which can make it a lot harder for me to grade your work — grrrr!)

Description

For this project, you will write a program that can compute the volume (v) of the following shapes, when requested by the user:



Your program should adhere to these specifications:

1. The program should be called **volume.cpp**.
2. (1 point) The program should have a `while` loop that asks the user which shape to compute a volume for (C for cone, U for cube, Y for cylinder, P for pyramid, S for sphere or Q to quit).
3. (1 point) The program should echo (display) the name of the requested shape, or say "goodbye" if the user requests "quit".
4. (1 point) The program should ask the user to enter the appropriate dimensions, depending on which shape is requested. For example, if the user selects **C** (cone), then the program should ask the user to enter the radius (r) and height (h).
5. (0.5 points) The program should echo the dimensions that the user entered.

6. (2 points) The program should compute the requested volume (by calling a function, as described below), using the dimensions that the user entered, and then display the volume.
7. (1 point) The program should make sure that the dimensions entered are valid (greater than 0). If invalid dimensions are entered, the program should handle this situation in a friendly way (you decide what is best).
8. (3.5 points) The program should contain a separate **function** that computes the volume of each shape. The headers (prototypes) for these functions are listed below. The program should define the body of each function and then call each function, as needed, to compute the requested volume.

```
double volCone( double r, double h );
double volCube( double a );
double volCylinder( double r, double h );
double volPyramid( double a, double h );
double volSphere( double r );
```

Sample output

An example run would look like this:

```
hello. welcome to the shape volume computing program.
which shape do you have? (C for cone, U for cube, Y for cylinder,
P for pyramid, S for sphere or Q to quit)
enter shape: U
okay, cube. please enter the length of a side: 3
okay, the length of the side = 3
the volume = 27
enter shape: C
okay, cone. please enter the radius of the base: 2
please enter the height: 3
okay, the radius = 2 and the height = 3
the volume = 12.56
enter shape: Q
bye!
```

Submission

- You will be submitting one file: **volume.cpp**
- Make sure that you have a comment at the top of the file that contains the name of the file, your name, "CIS 1.5 HW3" and the submission date (October 23, 2009).
- The subject line of your email should say: CIS 1.5 HW3
- The body of your email should contain your name.