## overview

- This is the project for unit III of cis 1.5. This project covers the usage of library functions and user-defined functions.

- The project is worth 10% of your term grade. It will be marked out of **10 points**.

- The project is due via email on **Wednesday April 1** *(no fooling!)*.

- Email the project to: `sklar@sci.brooklyn.cuny.edu`.

- 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**

- Note that if you are using an IDE, all your C++ source code file will be named **main.cpp**. You will have to rename it before putting it in the zip archive!

project description

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

cone	cube	cylinder	pyramid	sphere
$v = 1/3\pi r^2 h$	$v = a^3$	$v = \pi r^2 h$	$v = (1/3)a^2 h$	$v = (4/3)\pi r^3$
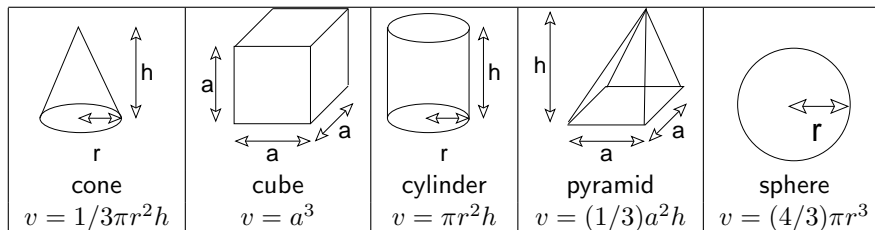
Your program should adhere to these specifications:

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 instructions

- 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 PROJECT 3" and the submission date (April 1, 2009).

- The SUBJECT LINE of your email should say: CIS 1.5 PROJECT 3

- The BODY of your email should contain your name.