

CS 12 - Lab 7

Class Inheritance and Operator Overloading

Write a class called *Point*. It should contain two data members of type float to hold the x and y coordinates of the point. It should also contain the following function members.

- The constructor should take two float parameters that are used to initialize the x and y coordinates.
- A function called *resetValues* that takes two parameters and sets the x and y coordinates.
- A function called *getX* that returns the value of the x coordinate.
- A function called *getY* that returns the value of the y coordinate.
- Overload the insertion (<<) operator so that it can print out a point class (the x and y coordinates).

Now write a class called *Circle*. It should inherit the class *Point* and have one float data member for the radius. The following member functions should also be written.

- The constructor should take two float parameters that are used to initialize the x and y coordinates representing the center of the circle and it should prompt the user for the radius length.
- A function called *resetRadius* that takes one parameter and sets the radius.
- A function called *getRadius* that returns the radius of the circle.
- A function called *Area* that calculates and returns the area of a circle (πr^2).
- Overload the insertion (<<) operator so that it can print out a circle class (the x and y coordinates and the radius).

Lastly, write a class called *Cylinder*. This class should inherit the class *Circle*. It should have a data member of type float to hold the height. It should also contain the following function members.

- The constructor should take two float parameters for the x and y coordinates of the center circle of the bottom of the cylinder. It should prompt the user for the height.
- A function called *resetHeight* that takes one parameter and sets the height.
- A function called *getHeight* that returns the height of the circle.

- A function called *Volume* that calculates and returns the volume of the cylinder ($circle_area * height$).
- Overload the insertion ($<<$) operator so that it can print out a cylinder class (the x and y coordinates, the radius, and the height).

You must use Unix, separate your program into separate files, and use a makefile.