

1. Give short answers for the questions below. (10 points)
2. (10 points) The program below uses the **Shape C++ Hierarchy**. Give the output for the program.
3. (10 points) The following C++ program will not compile because of an error on line 39. Why is this an error (5 pts)? How can you fix it (5 pts)?
4. (10 points) The program below demonstrates **getattr** and **map**. Give the output.
5. (10 points) The following program demonstrates **_call_**, **map** and class attributes. Give the output.
6. (10 points) Write a main segment of code that demonstrates that a class, listed below, is **not** a singleton. Explain how your code supports your conclusion.
7. (10 points) The following Python program illustrates a Design Pattern. Give the output of the program.
8. (15 points) The program below contains a class **Singleton**. Write code to show that the class is or is not a Singleton Design Pattern; explain how your code demonstrates your conjecture.

9. (15 points) The following program demonstrates the Visitor Design Pattern in Python. Give the output.