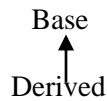
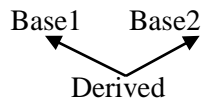


Assignment Part 3

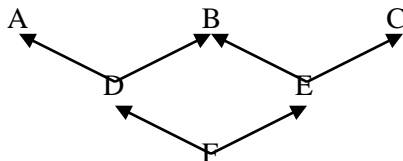
28. Write empty class declarations for the following class hierarchy.



29. Write empty class declarations for the following class hierarchy.



30. Write empty class declarations for the following class hierarchy.



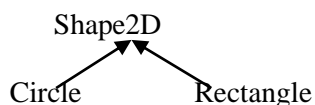
31. Write a class Person having data member name, age, height etc. Write proper constructors, methods to get/set them and a method printDetails() that prints all information of a person. Now write another class Student from Person and add data members roll, year of admission etc. Write constructors, methods to get/set them and a override printDetails(). Now create a Person and a Student object and call printDetails() function on them to display their information.

Now Create an array of pointers to Person and store addresses of two Persons and two Students. Call printDetails() on all elements (a loop may be used). Are you getting output which is supposed to come? Make printDetails() function virtual in the base class and check the result.

32. Write a class Employee having data member name, salary etc. Write proper constructors, methods to get/set them and a virtual method printDetails() that prints all information of a person. Now write two classes Manager and Clerk from Employee. Add 'type' and 'allowance' in the manager and Clerk respectively. Write constructors, methods to get/set them and a override printDetails(). Now create a Manager and a Clerk object and call printDetails() function on them to display their information.

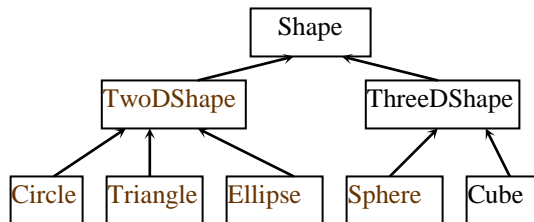
Now Create an array of pointers to Employee and store addresses of two Employee, two Managers and two Clerks. Call printDetails() on all elements (a loop may be used). Also find the total salary drawn by all employees.

33. Write class definitions for the following class hierarchy



The Shape2D class represents two dimensional shapes that should have pure virtual functions area(), perimeter() etc. Implement these functions in Circle and Rectangle. Also write proper constructor(s) and other functions you think appropriate in the Circle and Rectangle class. Now create an array of 5 Shape2D pointers. Create 3 Circle and 2 Rectangles objects and place their addresses in that array. Use a loop to print area and perimeter of all shapes on this array.

34. **Implement** the Shape hierarchy as shown in the figure. Each **TwoDShape** should contain function **getArea** to calculate the area of two-dimensional shape. Each **ThreeDShape** should have member functions **getArea** and **getVolume** to calculate the surface area and volume of the three-dimensional shape respectively. Create a program that uses Vector of Shape pointers to objects of each concrete class in the hierarchy. Now write a program that processes all the shapes in the Vector such that if the shape is a **TwoDShape** it prints name of shape and its area while it prints name of shape, its area and volume if the shape is a **ThreeDShape**.



35. Write a program to illustrate the role of virtual destructor.