Lab Assignment-5

5. Programming Exercises on Inheritance, Pointers, Virtual Functions and Polymorphism

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5.1 An educational institution wishes to maintain a database of its employees. The database is divided into a number of classes whose hierarchical relationships are shown in Fig. 2. The

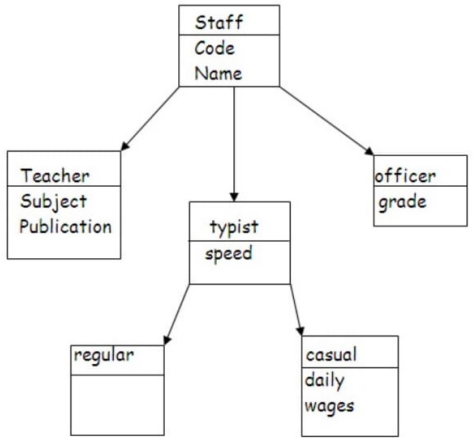

Figure 2: Class Relationships

figure also shows the minimum information required for each class. Specify all the classes and define functions to create the database and retrieve individual information as and when required.

5.2 Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base class, a member function get_data() to initialize base class data members and another member function display_area() to compute and display the area of figures. Make display_area() as a virtual function and redefine this function in the derived classes to suit their requirements.
Using these three classes, design a program that will accept dimensions of a triangle or a rectangle interactively, and display the area.
Remember the two values given as input will be treated as lengths of two sides in the case of rectangles and as base and height in the case of triangles, and used as follows:
Area of rectangle = x * y
Area of triangle = $\frac{1}{2}$ * x * y