S. V. National Institute of Technology Surat
Computer Engineering Department
PPL Lab
Assignment 6

1. Declare a class called author having author_name as private data member. Extend author class to have two sub classes called book_publication & paper_publication. Each of these classes have private member called title. Show usage of dynamic method dispatch (dynamic polymorphism) to display book or paper publications of a given author. Use command line arguments for inputting data.

2. Write a class named Rectangle to represent a rectangle. It contains the following members:
   Data: width (double) and height (double) that specify the width and height of the rectangle.
   Methods:
   1. A no-arg constructor that creates a default rectangle.
   2. A constructor that creates a rectangle with the specified width and height.
   3. A method named getArea() that returns the area of this rectangle.
   4. A method named getPerimeter() that returns the perimeter

3. It is required to compute SPI (semester performance index) of n students of a class for their registered subjects in a semester.
   Assume that all students register for 6 subjects and each subject carry 5 credits. Also, follow SVNIT convention and method for computation of SPI.
   Declare a class called student having following data members:
   id_no, grades_obtained and SPI.
   Define constructor, display and calculate_spi methods. Define main to process data of n students.

4. It is required to maintain and process the status of total 9 resources. The status value is to be stored in an integer array of dimensions 3x3. The valid status of a resource can be one of the following:
   free: indicated by integer value 0
   occupied: indicated by integer value 1
   inaccessible: indicated by integer value 2
   Declare a class called ResourcesStatus, having data member called statusRef, referring to a two dimensional array (3x3) of integers to be used to refer to the above mentioned status values. Define a member method called processStausCount that counts and displays total number of free resources, total number of occupied resources and total number of inaccessible resources. The exception to be raised and handled if total number of occupied resources exceeds total number of free resources. The handler marks status of all inaccessible resources as free. Accept initial status values from command line arguments and initialize the array. Raise and handle user defined exception if invalid status value given.