**OOP LAB**

**Session I**

**Part I**

**Lab No. 1:** Simple Java Programs using Control Structures

Lab Exercises

1. a. Write a method **isPrime** to accept one integer parameter and to check whether that parameter is prime or not.

b. Using this method, generate first N prime numbers in the main method.

**Lab No. 2:** 1D and 2D Arrays

Lab Exercises

1. Arrange the elements in ascending and descending order using Bubble sort method.
2. Find the addition of two matrices and display the resultant matrix.

**Part II**

**Lab No. 3:** Classes and Objects

Lab Exercises

1. Define a class to represent a complex number called Complex. Provide the following methods:
   1. To assign initial values to the Complex object.
   2. To display a complex number in a+ib format.
   3. To add 2 complex numbers. (the return type should be Complex)
   4. To subtract 2 complex numbers Write a main method to test the class.

[Hint: Make use of Math.abs() during subtraction.]

1. Create a class called Time that has instance variables to represent hours, minutes and seconds. Provide the following methods:
   1. To assign initial values to the Time object.
   2. To display a Time object in the form of hh:mm:ss {24 hours format}
   3. To add 2 Time objects (the return type should be a Time )
   4. To subtract 2 Time objects (the return type should be a Time )
   5. To compare 2 Time objects and to determine if they are equal or if the first is greater or smaller than the second one.

**Lab No. 4:** Constructors and Static Members

Lab Exercises

1. Consider the already defined Complex class. Provide a default constructor and parameterized constructor to this class. Also provide a display method. Illustrate all the constructors as well as the display method by defining Complex objects.
2. Create a class called Counter that contains a static data member to count the number of Counter objects being created. Also define a static member function called showCount() which displays the number of objects created at any given point of time. Illustrate this.

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