**JAVA PROGRAMMING**

**LAB CYCLE**

**Note: Strictly follow OOPS concepts & naming conventions**

**Cycle 1**

1. Write a program to print first ‘n’ prime numbers (read ‘n’ as a command line argument).
2. Write a program to read a number ‘n’ and a string ‘str’ as a command line argument and print ‘str’ n times.
3. Write a program to write a class **Student** having members ‘name’, ‘roll number’, ‘5 subject marks’ and ‘total’. Provide methods for
4. Initializing name, roll number and marks.
5. Calculate the total
6. Get back the total
7. Print the details

Create 2 Student objects and print the details of the student with a greater total.

1. Write a program to create a class **Complex** have two members, **real** and **imaginary** and methods to initialize and print the complex number.

Create another class **ComplexOperations** and provide static methods to add, multiply and get the modulus

1. Write a program to create a class **Box** with data members length, breadth, height, area and volume. Provide 3 constructors having one parameter (for cube), two parameters (for square prism) three parameters (rectangular prism). Also provide functions to calculate area and volume.

Find the area of a cube, a square prism and a rectangular prism using the above class.

1. Write a program to create a class called **Rectangle** with members length, breadth and area. Provide functions to find area and get back the area. Create a new class **Box** by extending **Rectangle** class add two new members, height and volume and also new functions to calculate and get back the volume.
2. Write a program to create an abstract base class **Account** with 3 members account holder name, account number and balance amount. Provide constructor to initialize data members, function to deposit cash to account and an abstract function, withdrawal.

Create two child classes **Saving Account** and **Current Account** of **Account** class. Override abstract function withdrawal in child classes as per the criteria, for savings maintain a minimum balance 1000 and for current account, one can withdraw 5% of current balance as overdraft amount. Illustrate the above as a menu driven program.

8. Write a program to create an interface, **3DShapes** with methods printVolume() and printArea(), which prints the Volume and Area respectively. Create classes **Cylinder** and **Sphere** by implementing **3DShapes** interface. Using these child classes calculate the print volume and area of a cylinder and sphere.

9. Write a program to create a class **Employee** with data members name, code and basic pay and with functions to initialize and print information. Create an interface **Salary** with a function salary calculation. By inheriting the **Employee** class and **Salary** Interface create a new class **SalarySlip** which override the salary calculation method to calculate the net salary of an employee from basic pay. Provide a function to print the Salary Slip of the employee in **SalarySlip** class.

10. Write a program to illustrate finalize() method.