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
    - **a)** Initializing name, roll number and marks.
    - **b)** Calculate the total
    - **c)** Get back the total
    - **d)** Print the details

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

4. 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
5. 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.
6. 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.

7. 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.