**DRONACHARYA COLLEGE OF ENGINEERING, GURUGRAM**

**Programs for Practice**

1. Develop a Java program to create a simple calculator using method overloading. Define a class 'Calculator' with overloaded methods for basic arithmetic operations such as addition, subtraction, multiplication and division. Each method should accept different combinations of parameters, such as two integers, two doubles, or an integer and a double. Ensure proper error handling for division by zero and invalid inputs. Provide a user interface for inputting numbers and selecting operations and display the result of each calculation. Test the program with various input scenarios to validate the correctness of method overloading implementation.
2. Design a Java program to model a hierarchy of vehicles using inheritance. Create a superclass 'Vehicle' with attributes such as 'make', 'model' and 'year. Implement subclasses for specific vehicle types such as 'Car', 'Truck' and 'Motorcycle' inheriting from the Vehicle superclass. Each subclass should include additional attributes and methods specific to its type, such as 'numDoors' for cars and 'payloadCapacity' for trucks. Ensure proper encapsulation and provide methods for accessing and modifying attributes. Test the program by creating instances of each vehicle type and demonstrating inheritance and polymorphism.
3. Write a Java program that accepts two integers from the user and prints the sum, the difference, the product, the average, the distance (the difference between the integers), the maximum (the largest of the two integers), and the minimum (the smallest of the two integers).
4. Write a Java program to create a class called Dog with instance variables name and color. Implement a parameterized constructor that takes name and color as parameters and initializes the instance variables. Print the values of the variables.
5. Write a Java program to create a class called Rectangle with instance variables length and width. Implement a parameterized constructor and a copy constructor that initializes a new object using the values of an existing object. Print the values of the variables.
6. Practice programs of different patterns
7. Practice array programs multiplication,addition and transpose
8. Factorial,fibnocci series,palindrome,prime number