**Java Assignment**

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Q1. Implement a Shape class with method area(), and override it in Circle, Rectangle

Ans:   
**Code:**

// Shape.java

class Shape {

void area() {

System.out.println("Calculating area...");

}

}

// Circle.java

class Circle extends Shape {

double radius;

Circle(double radius) {

this.radius = radius;

}

void area() {

double result = 3.14 \* radius \* radius;

System.out.println("Area of Circle: " + result);

}

}

// Rectangle.java

class Rectangle extends Shape {

double length, width;

Rectangle(double length, double width) {

this.length = length;

this.width = width;

}

void area() {

double result = length \* width;

System.out.println("Area of Rectangle: " + result);

}

}

// Main.java

public class Main {

public static void main(String[] args) {

Circle c = new Circle(5);

Rectangle r = new Rectangle(4, 6);

c.area(); // Calls Circle's area()

r.area(); // Calls Rectangle's area()

}

}

**Output:**

Area of Circle: 78.5

Area of Rectangle: 24.0

Q2. Create one parent class Vehicle, and two child classes Car and Bike.

Ans:

**Code:**

// Parent class

class Vehicle {

void start() {

System.out.println("Vehicle is starting...");

}

}

// Child class: Car

class Car extends Vehicle {

void carFeature() {

System.out.println("Car has 4 wheels and a music system.");

}

}

// Child class: Bike

class Bike extends Vehicle {

void bikeFeature() {

System.out.println("Bike has 2 wheels and is fuel efficient.");

}

}

// Main class to run the program

public class Main {

public static void main(String[] args) {

// Creating Car object

Car myCar = new Car();

myCar.start();

myCar.carFeature();

Bike myBike = new Bike();

myBike.start();

myBike.bikeFeature();

}

}

**Output:**

Vehicle is starting...

Car has 4 wheels and a music system.

Vehicle is starting...

Bike has 2 wheels and is fuel efficient.

Q3. Create a class Employee with fields id, name, and salary. Write a method to display employee information. Create multiple employee objects and call the method.

Ans:

**Code:**

// Employee.java

class Employee {

int id;

String name;

double salary;

// Constructor to initialize employee data

Employee(int id, String name, double salary) {

this.id = id;

this.name = name;

this.salary = salary;

}

// Method to display employee details

void displayInfo() {

System.out.println("ID: " + id);

System.out.println("Name: " + name);

System.out.println("Salary: ₹" + salary);

System.out.println("---------------------");

}

}

// Main class

public class Main {

public static void main(String[] args) {

// Creating multiple Employee objects

Employee emp1 = new Employee(101, "Anushka", 50000);

Employee emp2 = new Employee(102, "Rohan", 60000);

Employee emp3 = new Employee(103, "Priya", 55000);

// Calling method to display information

emp1.displayInfo();

emp2.displayInfo();

emp3.displayInfo();

}

}

**Output:**

ID: 101

Name: Anushka

Salary: ₹50000.0

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ID: 102

Name: Rohan

Salary: ₹60000.0

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ID: 103

Name: Priya

Salary: ₹55000.0

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Q4. Write a program to create a class Calculator with methods to perform addition, subtraction, multiplication, and division. Create an object and perform all operations.

Ans:

**Code:**

// Calculator.java

class Calculator {

// Method for addition

void add(double a, double b) {

double result = a + b;

System.out.println("Addition: " + result);

}

// Method for subtraction

void subtract(double a, double b) {

double result = a - b;

System.out.println("Subtraction: " + result);

}

// Method for multiplication

void multiply(double a, double b) {

double result = a \* b;

System.out.println("Multiplication: " + result);

}

// Method for division

void divide(double a, double b) {

if (b != 0) {

double result = a / b;

System.out.println("Division: " + result);

} else {

System.out.println("Division by zero is not allowed.");

}

}

}

// Main class to use the Calculator

public class Main {

public static void main(String[] args) {

Calculator calc = new Calculator();

double num1 = 10;

double num2 = 5;

// Performing operations

calc.add(num1, num2);

calc.subtract(num1, num2);

calc.multiply(num1, num2);

calc.divide(num1, num2);

}

}

**Output:**

Addition: 15.0

Subtraction: 5.0

Multiplication: 50.0

Division: 2.0