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Assignment No : 03

Lab Exercise No:1

Exercise Objective(s): The concept of inheritance

Exercise: Create a class called Vehicle. Create subclasses like Truck, Bus, Car etc. Add common methods in the base class and specific methods in the corresponding class. Create a class called Road and create objects for the Truck, Car, Bus etc and display the appropriate message.

Answer:

```
package assignment.day3.proj;


//Base class
class Vehicle {
 String name;

 // Method to set the name
 void setName(String vehicleName) {
    name = vehicleName;
 }

 // Common method
 void displayInfo() {
    System.out.println("This is a " + name);
 }
}

//Subclass Truck
```

```
class Truck extends Vehicle {
 // Specific method for Truck
 void loadCargo() {
    System.out.println(name + " is loading cargo.");
 }
}

//Subclass Bus
class Bus extends Vehicle {
 // Specific method for Bus
 void pickPassengers() {
    System.out.println(name + " is picking up passengers.");
 }
}

//Subclass Car
class Car extends Vehicle {
 // Specific method for Car
 void driveFast() {
    System.out.println(name + " is driving fast.");
 }
}

//Road class
class Road {
 public static void main(String[] args) {
    // Create objects for Truck, Bus, and Car
    Truck truck = new Truck();
```

```
        truck.setName("Truck");
        truck.displayInfo();
        truck.loadCargo();

        Bus bus = new Bus();
        bus.setName("Bus");
        bus.displayInfo();
        bus.pickPassengers();

        Car car = new Car();
        car.setName("Car");
        car.displayInfo();
        car.driveFast();
    }
}
```

Output:

This is a Truck

Truck is loading cargo.

This is a Bus

Bus is picking up passengers.

This is a Car

Car is driving fast.

Lab Exercise No:2

Write a Java program to Implement single inheritance

Answer:

```
package assignment.day3.proj;
//Base class
class Animal {
 void eat() {
    System.out.println("This animal eats food.");
 }
}

//Derived class
class Dog extends Animal {
 void bark() {
    System.out.println("The dog barks.");
 }
}

//Main class to test single inheritance
public class SingleInheritanceDemo {
 public static void main(String[] args) {
    Dog dog = new Dog();
    dog.eat();  // Inherited method
    dog.bark(); // Method of Dog class
 }
}
```

Output:

This animal eats food.

The dog barks.

Lab Exercise No:3

Write a Java program to based on the multilevel inheritance in Java

Answer:

```
package assignment.day3.proj;

//Base class
class Animaln {
 void eat() {
    System.out.println("This animal eats food.");
 }
}

//Derived class
class Dogn extends Animaln {
 void bark() {
    System.out.println("The dog barks.");
 }
}

//Further derived class
class Puppy extends Dogn {
 void weep() {
    System.out.println("The puppy weeps.");
```

```
 }
}

//Main class to test multilevel inheritance
public class MultilevelInheritanceDemo {
 public static void main(String[] args) {
    Puppy puppy = new Puppy();
    puppy.eat();  // Inherited from Animal class
    puppy.bark(); // Inherited from Dog class
    puppy.weep(); // Method of Puppy class
 }
}
```

Output:

This animal eats food.

The dog barks.

The puppy weeps.

Lab Exercise No:4

Create a class named 'Member' having the following members:

Data members

1 - Name

2 - Age

3 - Phone number

4 - Address

5 - Salary

It also has a method named 'printSalary' which prints the salary of the members.

Two classes 'Employee' and 'Manager' inherits the 'Member' class. The 'Employee' and 'Manager' classes have data members 'specialization' and 'department' respectively. Now, assign name, age, phone number, address and salary to an

employee and a manager by making an object of both of these classes and print the same.

Answer:

```
package assignment.day3.proj;


//Base class Member
class Member {
 String name;
 int age;
 String phoneNumber;
 String address;
 double salary;

 // Method to print the salary
 void printSalary() {
    System.out.println("Salary: " + salary);
 }

 // Method to display member details
 void displayDetails() {
    System.out.println("Name: " + name);
    System.out.println("Age: " + age);
    System.out.println("Phone Number: " + phoneNumber);
    System.out.println("Address: " + address);
    printSalary();
 }
}
```

```
//Subclass Employee
class Employee extends Member {
 String specialization;

 // Method to display Employee details
 void displayEmployeeDetails() {
    System.out.println("Specialization: " + specialization);
    displayDetails();
 }
}

//Subclass Manager
class Manager extends Member {
 String department;

 // Method to display Manager details
 void displayManagerDetails() {
    System.out.println("Department: " + department);
    displayDetails();
 }
}

//Main class
public class Main {
 public static void main(String[] args) {
    // Creating Employee object
    Employee employee = new Employee();
employee.name = "John";
```

```
    employee.age = 30;
    employee.phoneNumber = "1234567890";
    employee.address = "123 Street, City";
    employee.salary = 50000;
    employee.specialization = "Software Development";

    // Display Employee details
    System.out.println("Employee Details:");
    employee.displayEmployeeDetails();

    // Creating Manager object
    Manager manager = new Manager();
manager.name = "Alice";
    manager.age = 40;
    manager.phoneNumber = "0987654321";
    manager.address = "456 Avenue, City";
    manager.salary = 80000;
    manager.department = "Human Resources";

    // Display Manager details
    System.out.println("\nManager Details:");
    manager.displayManagerDetails();
 }
}
```

Output:

Employee Details:

Specialization: Software Development

Name: John

Age: 30

Phone Number: 1234567890

Address: 123 Street, City

Salary: 50000.0

Manager Details:

Department: Human Resources

Name: Alice

Age: 40

Phone Number: 0987654321

Address: 456 Avenue, City

Salary: 80000.0