INHERITANCE

Aim:

To understand and implement inheritance concepts in Java.

PRE LAB EXERCISE

QUESTIONS

✓ **What is inheritance?**

Inheritance is an OOP concept where one class (child/subclass) acquires the properties and methods of another class (parent/superclass). It lets you build new classes based on existing ones.

✓ **What is code reusability?**

Code reusability means using existing code again instead of rewriting it. It reduces duplication, saves time, and makes programs easier to maintain.

✓ **What is the use of extends keyword?**

extends keyword is used to create inheritance. It tells the compiler that one class is derived from another and should inherit its features.

IN LAB EXERCISE

Objective:

To implement all types of inheritance.

PROGRAMS:

Student Result System (Single Inheritance)

Question:
A school wants to store student details and calculate marks. Create a base class Student and a derived class Result.

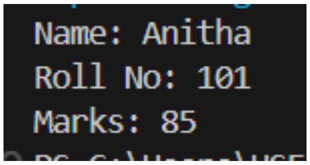
Code:

```
class Student {
   String name;
   int rollNo;

   void getDetails() {
      name = "Anitha";
      rollNo = 101;
   }
}

class Result extends Student {
   int marks = 85;

   void display() {
      System.out.println("Name: " + name);
      System.out.println("Roll No: " + rollNo);
      System.out.println("Marks: " + marks);
   }
}
```

```
public class Main {
   public static void main(String[] args) {
      Result r = new Result();
      r.getDetails();
      r.display();
   }
}
```

Output:

```
Name: RAM
Roll No: 101
Marks: 85
```



```
Name: Anitha
Roll No: 101
Marks: 85
```

2. Bank Account System (Hierarchical Inheritance)

Question:
A bank has Savings and Current accounts. Both inherit from a common Account class.

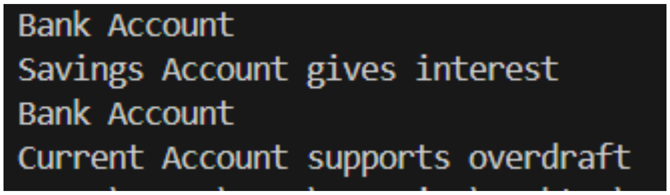
Code:

```
class Account {
   void showAccountType() {
      System.out.println("Bank Account");
   }
}


class SavingsAccount extends Account {
    void interest() {
        System.out.println("Savings Account gives interest");
    }
}

class CurrentAccount extends Account {
    void overdraft() {
        System.out.println("Current Account supports overdraft");
    }
}

public class Main {
    public static void main(String[] args) {
        SavingsAccount s = new SavingsAccount();
        CurrentAccount c = new CurrentAccount();

        s.showAccountType();
        s.interest();

        c.showAccountType();
        c.overdraft();
    }
}
```

Output:

```
Bank Account
```

```
Savings Account gives interest

Bank Account

Current Account supports overdraft
```



```
Bank Account
Savings Account gives interest
Bank Account
Current Account supports overdraft
```

3. Vehicle System (Multilevel Inheritance)

Question:
A company classifies vehicles as Vehicle → Car → ElectricCar.

Code:

```
class Vehicle {

   void start() {

      System.out.println("Vehicle starts");

   }

}


class Car extends Vehicle {

   void fuelType() {

      System.out.println("Car uses petrol");

   }

}


class ElectricCar extends Car {

   void battery() {

      System.out.println("Electric car uses battery");
```

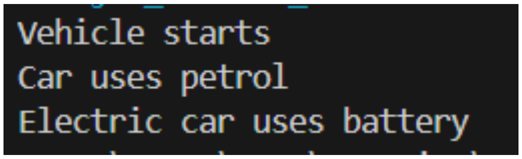
```
    }
}

public class Main {
    public static void main(String[] args) {
        ElectricCar e = new ElectricCar();
        e.start();
        e.fuelType();
        e.battery();
    }
}
```

Output:

Vehicle starts

Car uses petrol

Electric car uses battery



```
Vehicle starts
Car uses petrol
Electric car uses battery
```

POST LAB EXERCISE

- ✓ **Why Java does not support multiple inheritance using classes and how it is implemented?**

  Because it creates confusion if two parent classes have the same method (diamond problem). Java avoids this error. Instead, it uses interfaces to achieve multiple inheritance safely.

✓ **What is the role of the super keyword? Give examples.**

super is used to refer to the parent class.

Uses :

- Call parent constructor → super();
- Access parent variable → super.x
- Call parent method → super.show();

✓ **Can a child class access private members of the parent class? Why?**

No. Private members belong only to the parent class. This protects data (encapsulation).

✓ **Explain why hybrid inheritance is not supported in Java.**

Hybrid inheritance includes multiple inheritance. Since Java doesn’t allow multiple inheritance with classes, hybrid inheritance with classes is also not supported. Interfaces are used instead.

Result:

Thus the different types of inheritance were implemented and executed successfully.

ASSESSMENT

Description	Max Marks	Marks Awarded
Pre Lab Exercise	**5**	
In Lab Exercise	**10**	
Post Lab Exercise	**5**	
Viva	**10**	
Total	**30**	
Faculty Signature		