Experiment Number : 05 **Date: 04-02-26**

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CSE-A1 **INHERITANCE**

Aim:

To understand and implement inheritance concepts in Java.

PRE LAB EXERCISE

QUESTIONS

✓ What is inheritance?

Inheritance is a feature of OOP where one class (child/subclass) **acquires the properties and methods** of another class (parent/superclass).

✓ What is code reusability?

Code reusability means **using existing code again** without rewriting it, which saves time and reduces errors.

✓ What is the use of extends keyword?

The extends keyword is used to **create a child class from a parent class**, so the child class can use the parent class’s methods and variables.

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:

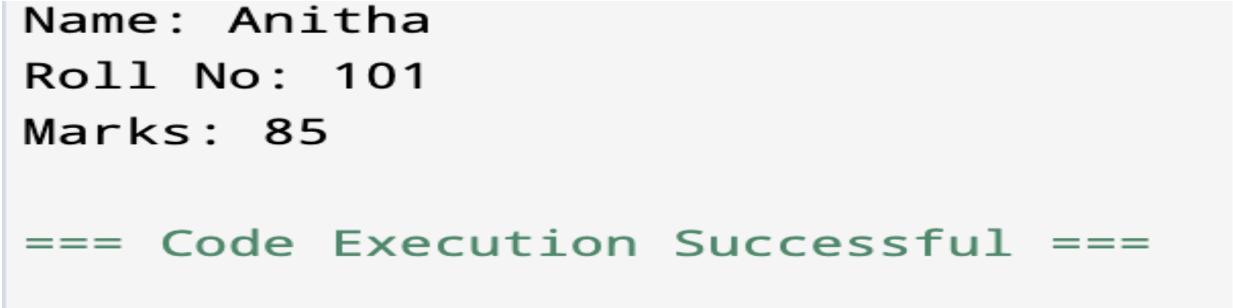
```
class Student {
    String name;
int rollNo;

    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: Anitha
```

Roll No: 101

Marks: 85



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

=== Code Execution Successful ===
```

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();
    }
}
```

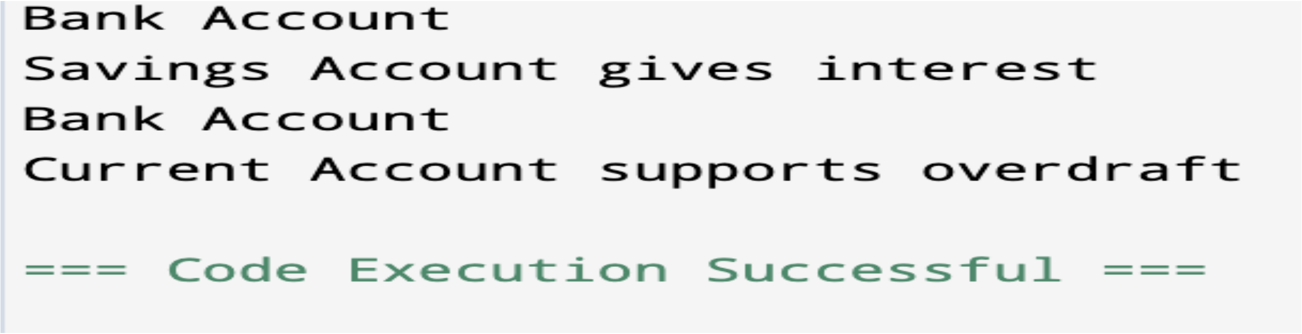
Output:

Bank Account

Savings Account gives interest

Bank Account

Current Account supports overdraft



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

=== Code Execution Successful ===
```

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();
    }
```

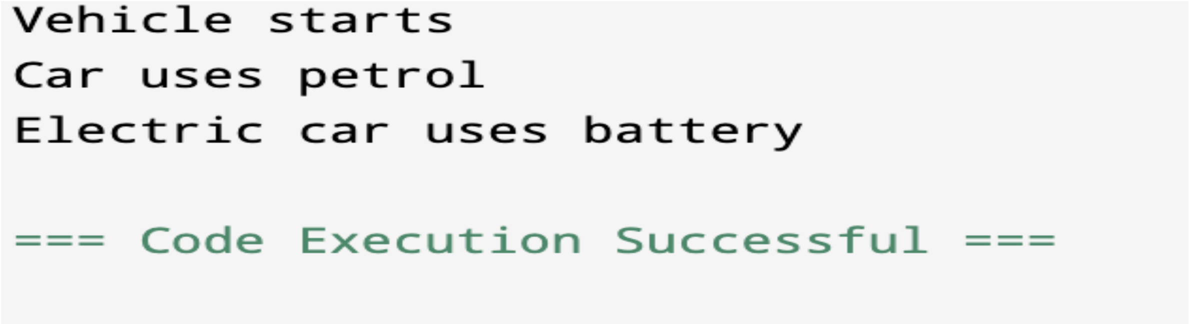
}

Output:

Vehicle starts

Car uses petrol

Electric car uses battery



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

=== Code Execution Successful ===
```

POST LAB EXERCISE

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

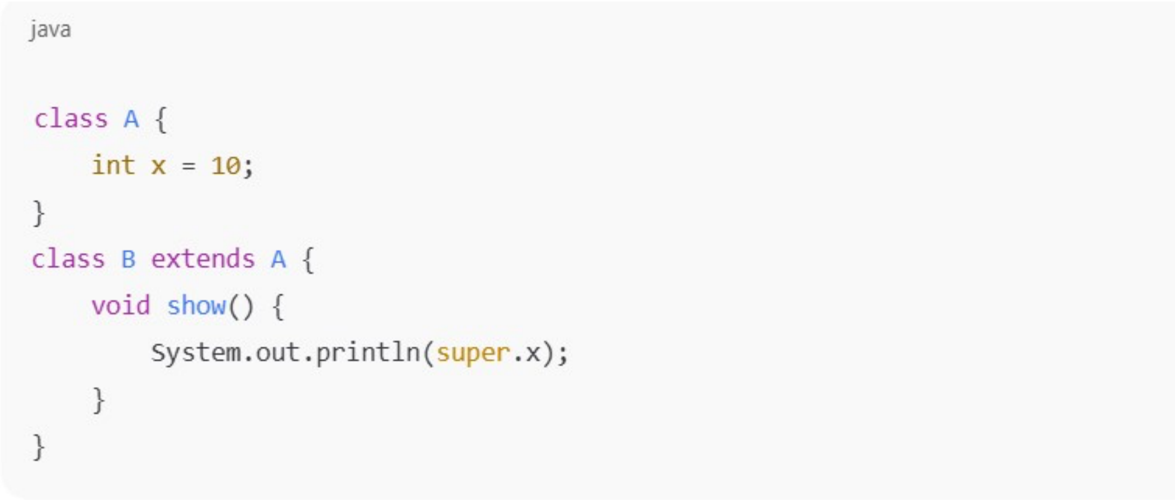
Java does not support multiple inheritance using classes to avoid **ambiguity (Diamond Problem)**.

It is implemented using **interfaces**, where a class can implement multiple interfaces without confusion.

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

The super keyword is used to **refer to the parent class object**.

It is used to access **parent class variables, methods, and constructors**.



```java
class A {
    int x = 10;
}
class B extends A {
    void show() {
        System.out.println(super.x);
    }
}
```

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

No.

Private members are **accessible only within the same class**, not in subclasses, to maintain **data security and encapsulation**.

✓ Explain why hybrid inheritance is not supported in Java.

Hybrid inheritance involves **multiple inheritance**, which leads to **ambiguity**. Since Java does not support multiple inheritance using classes, **hybrid inheritance is also not supported**.

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		