

Experiment No.-04

Aim: Understand and implement Inheritance and its types in Java.

Problem Statement:

1. Write a Program to implement multilevel Inheritance.
2. Write a Program to implement Hierarchical Inheritance.
3. Write a Program to demonstrate use of super keyword..

Theory:

Inheritance in java is a mechanism in which one object acquires all the properties and behaviors of parent object. The idea behind inheritance in java is that you can create new classes that are built upon existing classes. When we inherit from an existing class, we can reuse methods and fields of parent class, and new class can add new methods and fields also. Inheritance represents the **IS-A relationship**, also known as *parent-child* relationship. Inheritance provides code reusability.

Super Class:

- The class whose features are inherited is known as superclass. Also known as a base class or a parent class.

Sub Class:

- The class that inherits the features of other class is known as a subclass. Also known as a derived class, extended class, or child class.

The syntax of Java Inheritance

```
class Subclass-name extends Superclass-name
{
    //methods and fields
}
```

- The **extends keyword** indicates that Making a new class that derives from an existing class. The meaning of "extends" is to increase the functionality.

Types of Inheritance:

On the basis of class, there can be three types of inheritance in java

- Single level Inheritance
- Multilevel level Inheritance
- Hierarchical level Inheritance
- Multiple Inheritance
- Hybrid Inheritance

Single level Inheritance

- When one class inherits another class, it is known as a single inheritance.

Multilevel level Inheritance

- When there is a chain of inheritance, it is known as multilevel inheritance.
- One can inherit from a derived class, thereby making this derived class the base class for the new class.

Hierarchical level Inheritance

- When two or more classes inherits a single class, it is known as hierarchical inheritance.
- In such kind of inheritance one class is inherited by many **sub classes**.

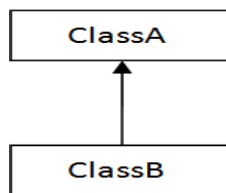
Multiple Inheritance

- In Multiple inheritances a subclass can inherit features from more than one parent class.
- One class extending (inherits) from more than one base class.
- To reduce the complexity and simplify the language, multiple inheritance is not supported in java.

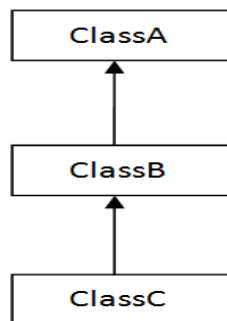
Hybrid Inheritance

- Hybrid inheritance is a combination of Single and Multiple inheritance.
- To reduce the complexity and simplify the language, Hybrid inheritance is not supported in java.

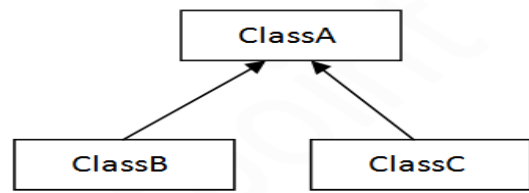
In java programming, multiple and hybrid inheritance is supported through interface only.



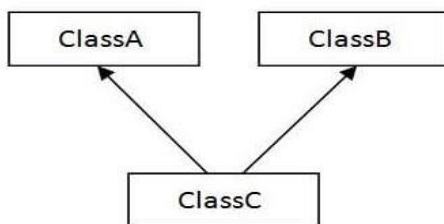
1) Single



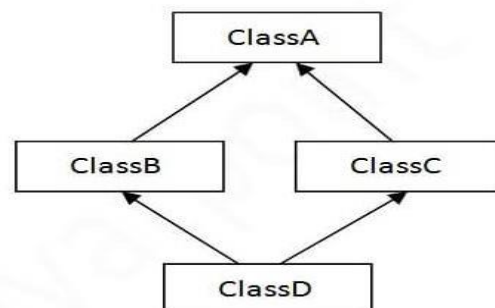
2) Multilevel



3) Hierarchical



4. Multiple Inheritance



5. Hybrid Inheritance

Conclusion:

Students understood and implemented the inheritance and its types.