

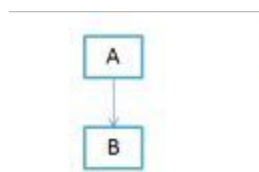
# Types of inheritance in Java:

## Single, Multiple, Multilevel & Hybrid

Below are Various types of inheritance in Java. We will see each one of them one by one with the help of examples and flow diagrams.

### 1) Single Inheritance

**Single inheritance** is damn easy to understand. When a class extends another one class only then we call it a single inheritance. The below flow diagram shows that class B extends only one class which is A. Here A is a **parent class** of B and B would be a **child class** of A.



(a) Single Inheritance

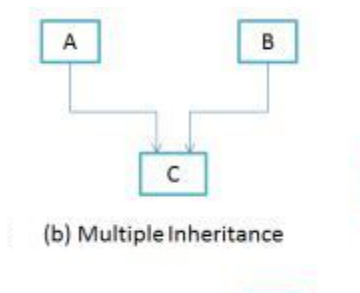
### Single Inheritance example program in Java

```
Class A
{
    public void methodA()
    {
        System.out.println("Base class method");
    }
}

Class B extends A
{
    public void methodB()
    {
        System.out.println("Child class method");
    }
    public static void main(String args[])
    {
        B obj = new B();
        obj.methodA(); //calling super class method
        obj.methodB(); //calling local method
    }
}
```

### 2) Multiple Inheritance

“**Multiple Inheritance**” refers to the concept of one class extending (Or inherits) more than one base class. The inheritance we learnt earlier had the concept of one base class or parent. The problem with “multiple inheritance” is that the derived class will have to manage the dependency on two base classes.

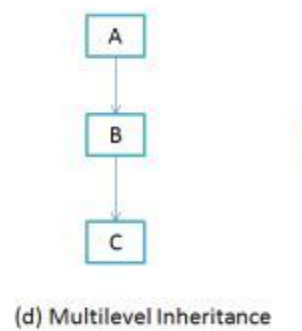


Note 1: Multiple Inheritance is very rarely used in software projects. Using Multiple inheritance often leads to problems in the hierarchy. This results in unwanted complexity when further extending the class.

Note 2: Most of the new OO languages like **Small Talk, Java, C# do not support Multiple inheritance**. Multiple Inheritance is supported in C++.

### 3) Multilevel Inheritance

**Multilevel inheritance** refers to a mechanism in OO technology where one can inherit from a derived class, thereby making this derived class the base class for the new class. As you can see in below flow diagram C is subclass or child class of B and B is a child class of A.



#### Multilevel Inheritance example program in Java

```

Class X
{
    public void methodX()
    {
        System.out.println("Class X method");
    }
}
Class Y extends X
{
    public void methodY()
    {
        System.out.println("class Y method");
    }
}
Class Z extends Y
{
    public void methodZ()
    {
        System.out.println("class Z method");
    }
}
  
```

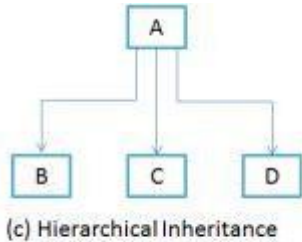
```

public static void main(String args[])
{
    Z obj = new Z();
    obj.methodX(); //calling grand parent class method
    obj.methodY(); //calling parent class method
    obj.methodZ(); //calling local method
}
}

```

#### 4) Hierarchical Inheritance

In such kind of inheritance one class is inherited by many **sub classes**. In below example class B,C and D **inherits** the same class A. A is **parent class (or base class)** of B,C & D.



#### 5) Hybrid Inheritance

In simple terms you can say that Hybrid inheritance is a combination of **Single** and **Multiple inheritance**. A typical flow diagram would look like below. A hybrid inheritance can be achieved in the java in a same way as multiple inheritance can be!! Using interfaces. yes you heard it right. By using **interfaces** you can have multiple as well as **hybrid inheritance** in Java.

