



19CSE204

Object Oriented Paradigm

2-0-3-3

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Inheritance in Java

Types of Inheritance- Examples



Types of Inheritance

A class which is inherited is called a **parent** or **superclass**, and the new class is called **child** or **subclass**.

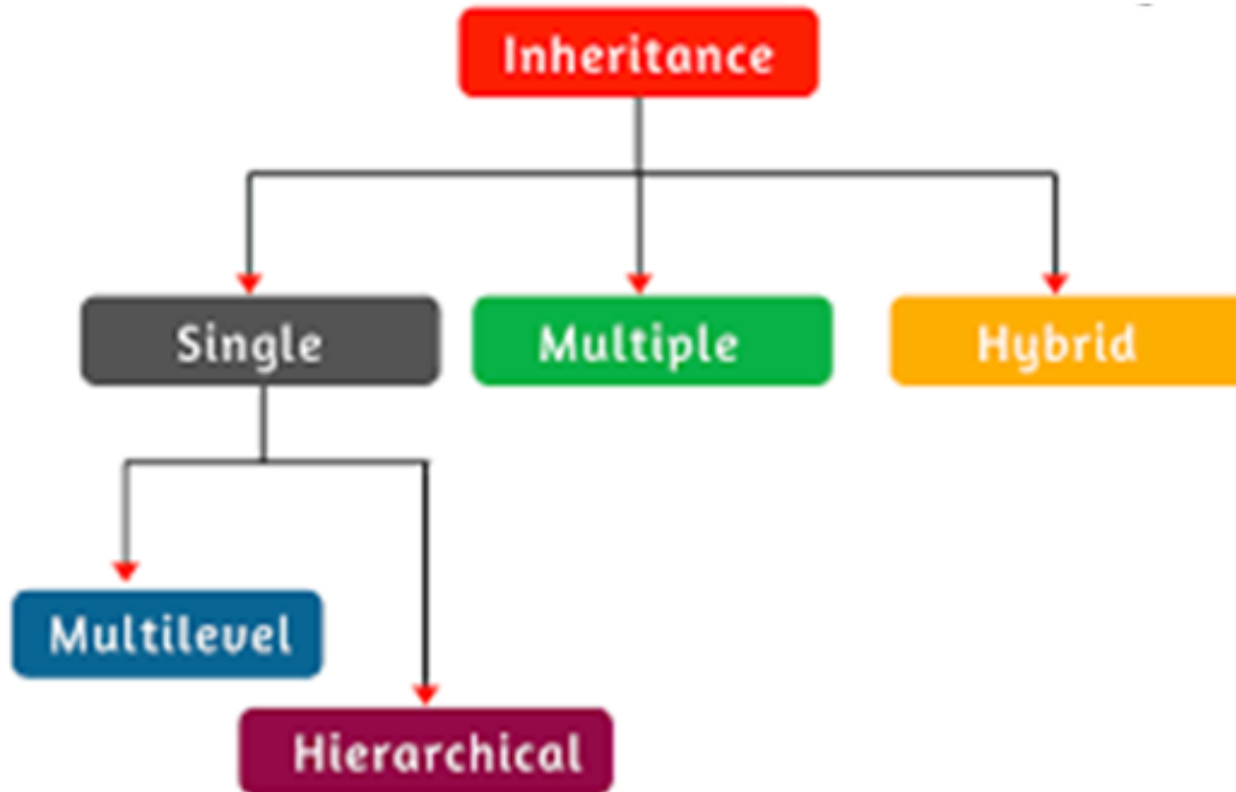
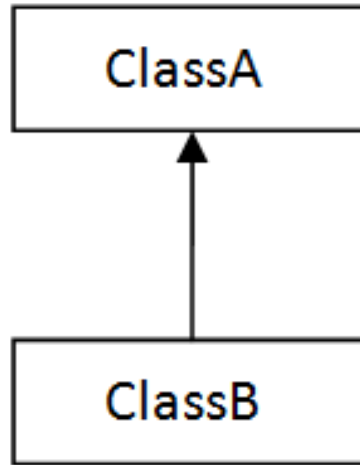
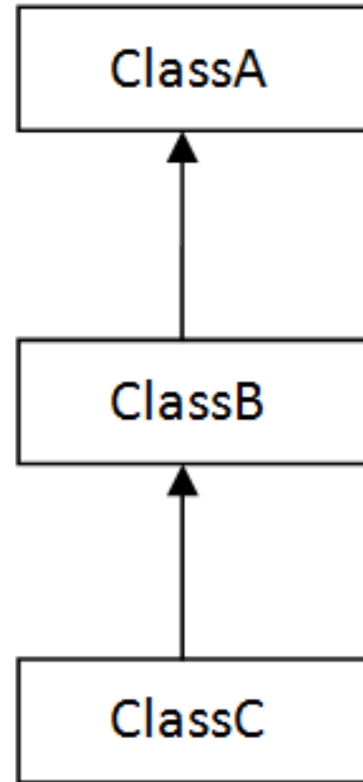


Fig: Classification of Inheritance in Java

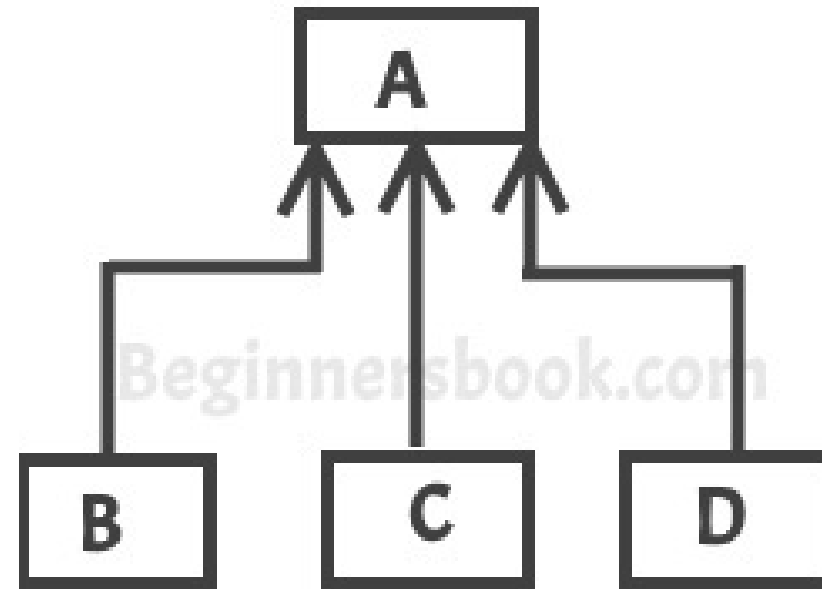




1) Single

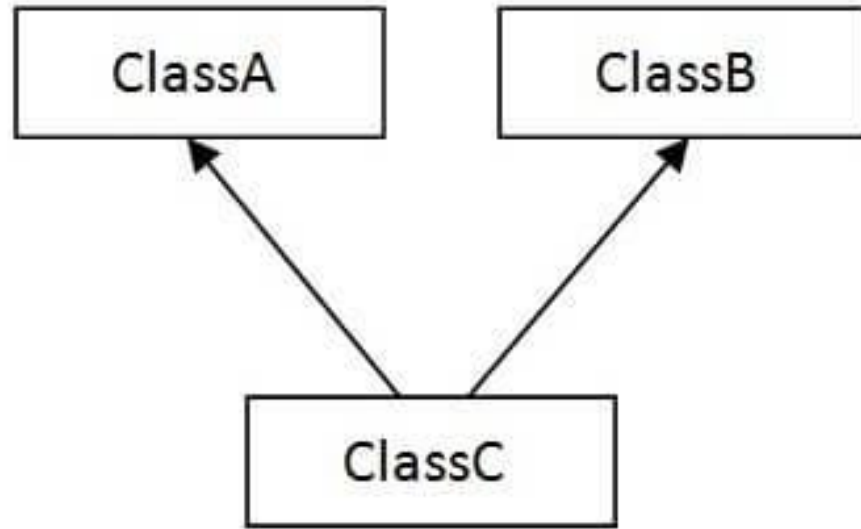


2) Multilevel



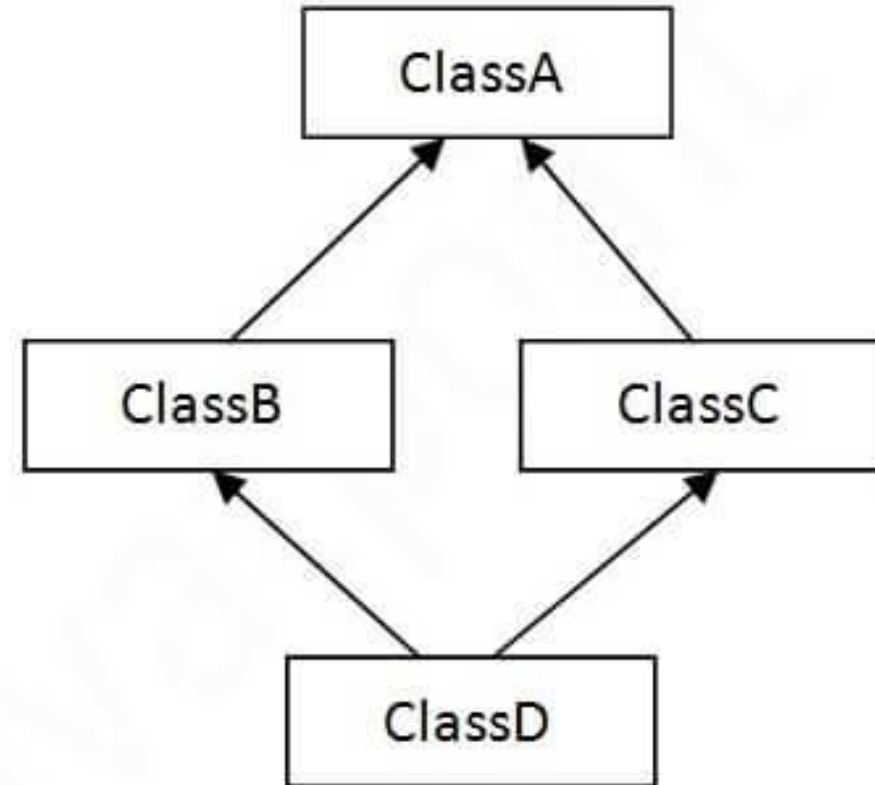
Hierarchical Inheritance





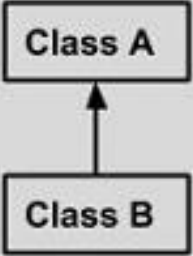
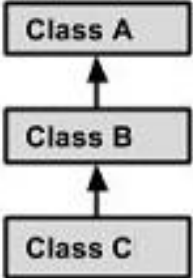
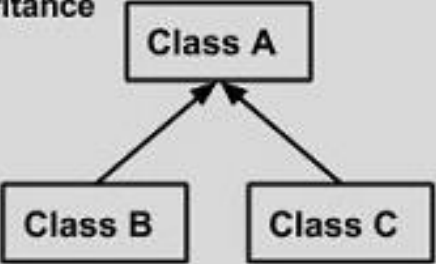
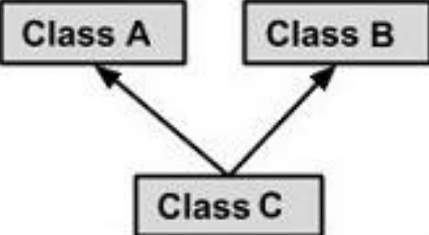
4) Multiple

Not supported in Java



5) Hybrid

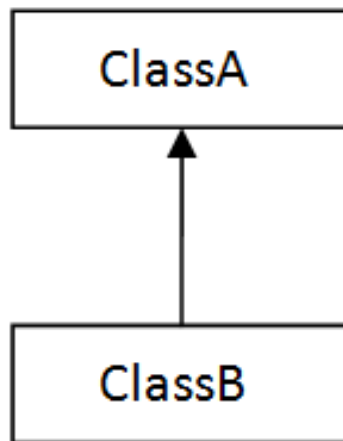


<p>Single Inheritance</p>  <pre> graph BT B[Class B] --> A[Class A] </pre>	<pre> public class A { } public class B extends A { } </pre>
<p>Multi Level Inheritance</p>  <pre> graph BT C[Class C] --> B[Class B] B --> A[Class A] </pre>	<pre> public class A {} public class B extends A {.....} public class C extends B {.....} </pre>
<p>Hierarchical Inheritance</p>  <pre> graph BT B[Class B] --> A[Class A] C[Class C] --> A </pre>	<pre> public class A {} public class B extends A {.....} public class C extends A {.....} </pre>
<p>Multiple Inheritance</p>  <pre> graph BT C[Class C] --> A[Class A] C --> B[Class B] </pre>	<pre> public class A {} public class B {.....} public class C extends A,B { } // Java does not support mutiple Inheritance </pre>



Single Inheritance Example

- When a class inherits another class, it is known as a **single inheritance**.
 - Eg: Dog class inherits the Animal class, so there is the single inheritance.



1) Single

```
1 package typesinheritance;
2 // Example of Single Inheritance
3
4 class Animal{
5 void eat(){System.out.println("eating...");}
6 }
7 class Dog extends Animal{
8 void bark(){System.out.println("barking...");}
9 }
10
11
12 public class typesinherit {
13
14     public static void main(String[] args) {
15         Dog d=new Dog();
16         d.bark();
17         d.eat();
18     }
19 }
20
21 }
```

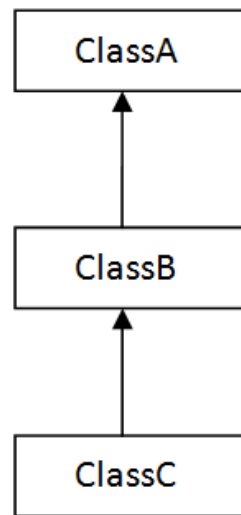
OUTPUT

barking...
eating...



Multilevel Inheritance example

- When there is a chain of inheritance, it is known as ***multilevel inheritance***.
 - Eg: BabyDog class inherits the Dog class which again inherits the Animal class, so there is a multilevel inheritance.



2) Multilevel

OUTPUT

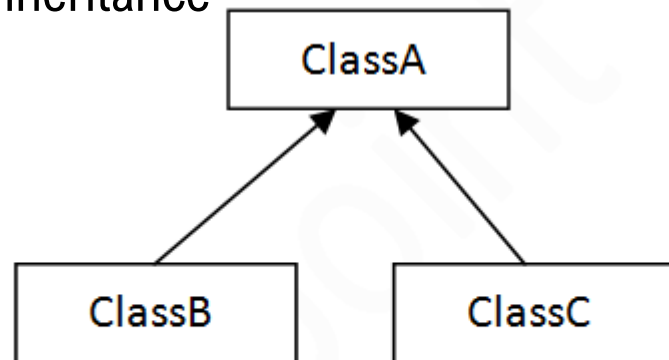
weeping...
barking...
eating...

```
1 package typesinheritance;
2 //Example of multilevel Inheritance
3 class Animal{
4     void eat(){System.out.println("eating...");}
5 }
6 class Dog extends Animal{
7     void bark(){System.out.println("barking...");}
8 }
9 class BabyDog extends Dog{
10    void weep(){System.out.println("weeping...");}
11 }
12
13 public class multilevel {
14
15     public static void main(String[] args) {
16         BabyDog d=new BabyDog();
17         d.weep();
18         d.bark();
19         d.eat();
20     }
21 }
22 }
```



Hierarchical Inheritance Example

- When two or more classes inherit a single class, it is known as ***hierarchical inheritance***.
 - Eg: Dog and Cat classes inherit the Animal class, so there is hierarchical inheritance



3) Hierarchical

```
package typesinheritance;
//Example of Hierarchical Inheritance
class Animal{
void eat(){System.out.println("eating...");}
}
class Dog extends Animal{
void bark(){System.out.println("barking...");}
}
class Cat extends Animal{
void meow(){System.out.println("meowing...");}
}
public class TestInheritance3 {

    public static void main(String[] args) {
        Cat c=new Cat();
        c.meow();
        c.eat();
        //c.bark();//C.T.Error

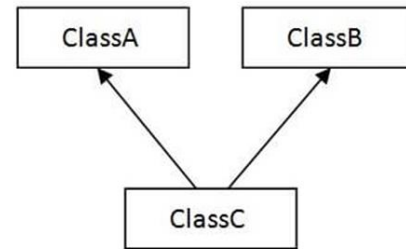
    }

}
```



Why multiple inheritance is not supported in java?

- Multiple Inheritance is a feature of object oriented concept, where a class can inherit properties of more than one parent class.
- The problem occurs when there exist methods with same signature in both the super classes and subclass.
- On calling the method, the compiler cannot determine which class method to be called and even on calling which class method gets the priority.



4) Multiple

```
1 package typesinheritance;
2 //First Parent class
3 class Parent1
4 {
5     void fun()
6     {
7         System.out.println("Parent1");
8     }
9 }
10
11 //Second Parent Class
12 class Parent2
13 {
14     void fun()
15     {
16         System.out.println("Parent2");
17     }
18 }
19
20 //Error : Test is inheriting from multiple
21 //classes
22 class Test extends Parent1, Parent2
23 {
24     public static void main(String args[])
25     {
26         Test t = new Test();
27         t.fun();
28     }
29 }
30
```

Output: Compilation Error



Namah Shivaya

