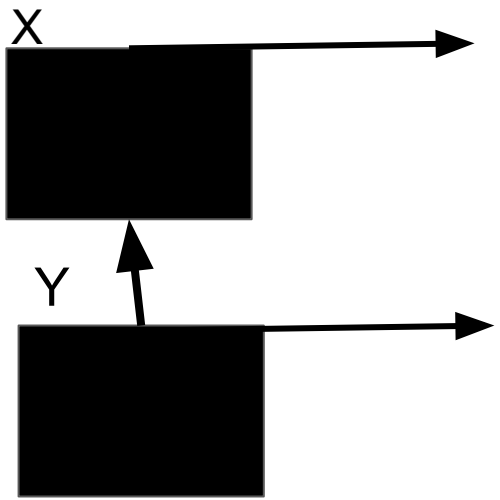
Inheritance

INHERITANCE

- It is a process of obtaining all the properties of one object into another object.
- The object which is receiving the properties is termed as child/sub/derived objects(classes).
- The object which is providing the properties is known as parent/super/base objects(classes).



Parent/Super/Base class
Declared members=1
Inherited Members=0

Total members =1

Child/Sub/Derived class
Declared members=1
Inherited Members=1

Total members =2

We can achieve Inheritance in Java with the help of the following Keywords:-

1. extends
2. implements

extends:-

a) extends is a Keyword.
b) It is used to achieve inheritance between two classes or between two interfaces.

USING extends FOR TWO CLASSES

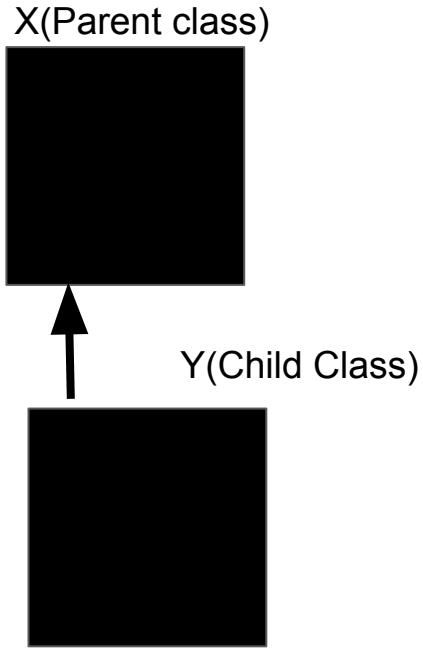
extends keyword can be used only with the child class.

SYNTAX TO ACHIEVE INHERITANCE BETWEEN TWO CLASSES

class ChildClassName extends ParentClassName

Eg;

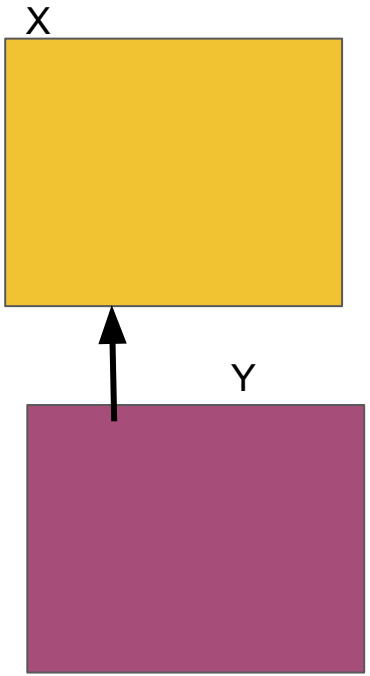
```
  class X
{
    int i;
}
class  Y extends X
{
   int j;
}
```



- Except private members and initializers of a class every member is inherited
- With the help of object reference variable we can access member of same class and its parent’s class but we cannot access members of its child class.
- With the help of sub class name we can use all the static members of subclass and its parents/super class.
- With the help of subclass object reference variable we can use both static and non static members of subclass as well as static and non static members of parent/superclass.
- With the help of the superclass reference type we cannot use member of its child or subclass.

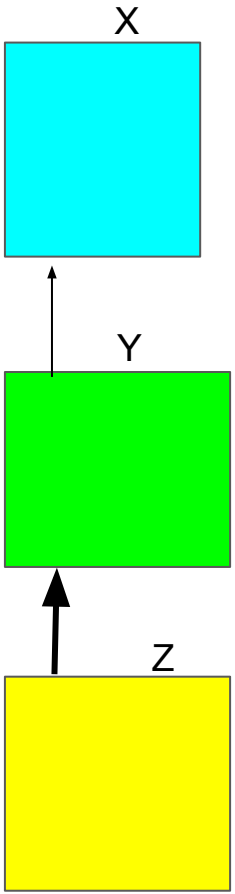
TYPES OF INHERITANCE

1.SINGLE LEVEL INHERITANCE :- Inheritance of only one level is known as single level inheritance.



Y Inherits X

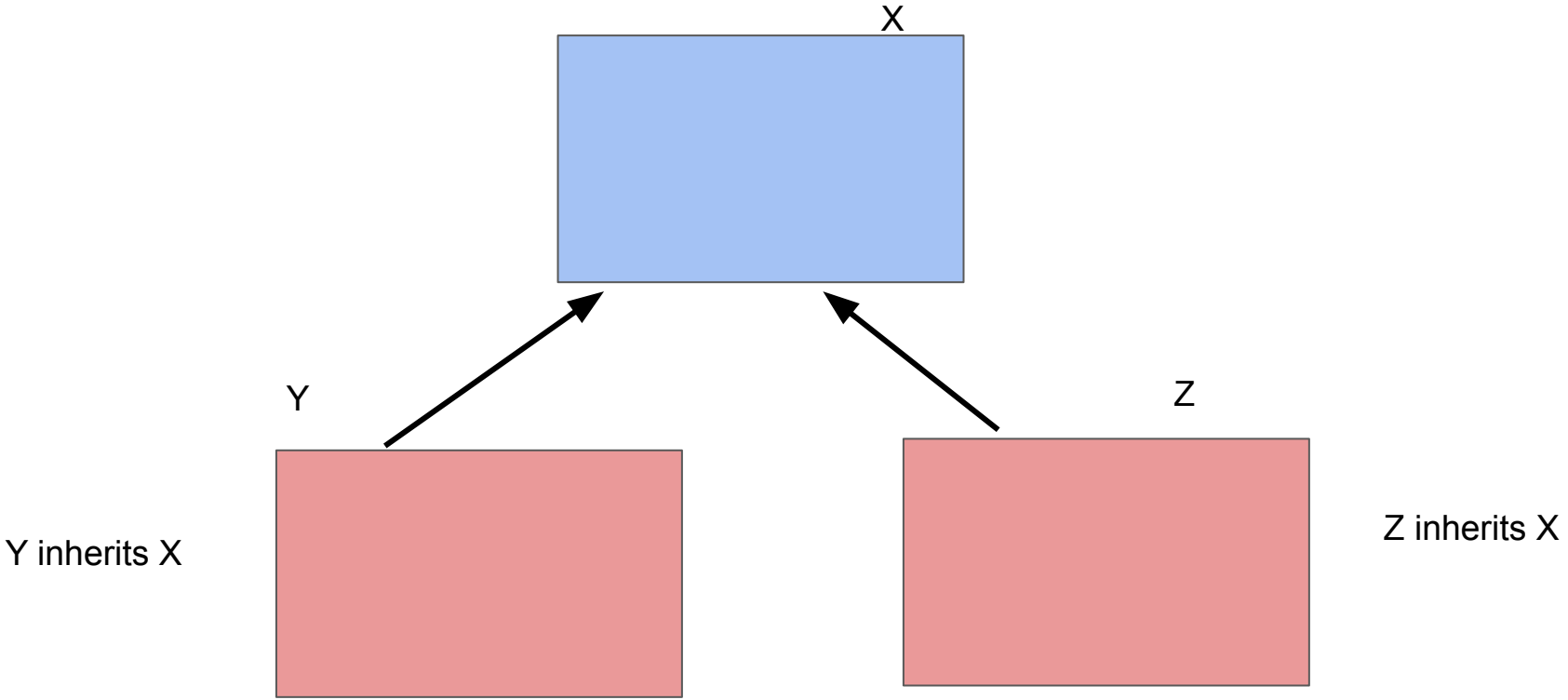
2. MULTI LEVEL INHERITANCE :- Inheritance of more than one level is known as multi level inheritance.



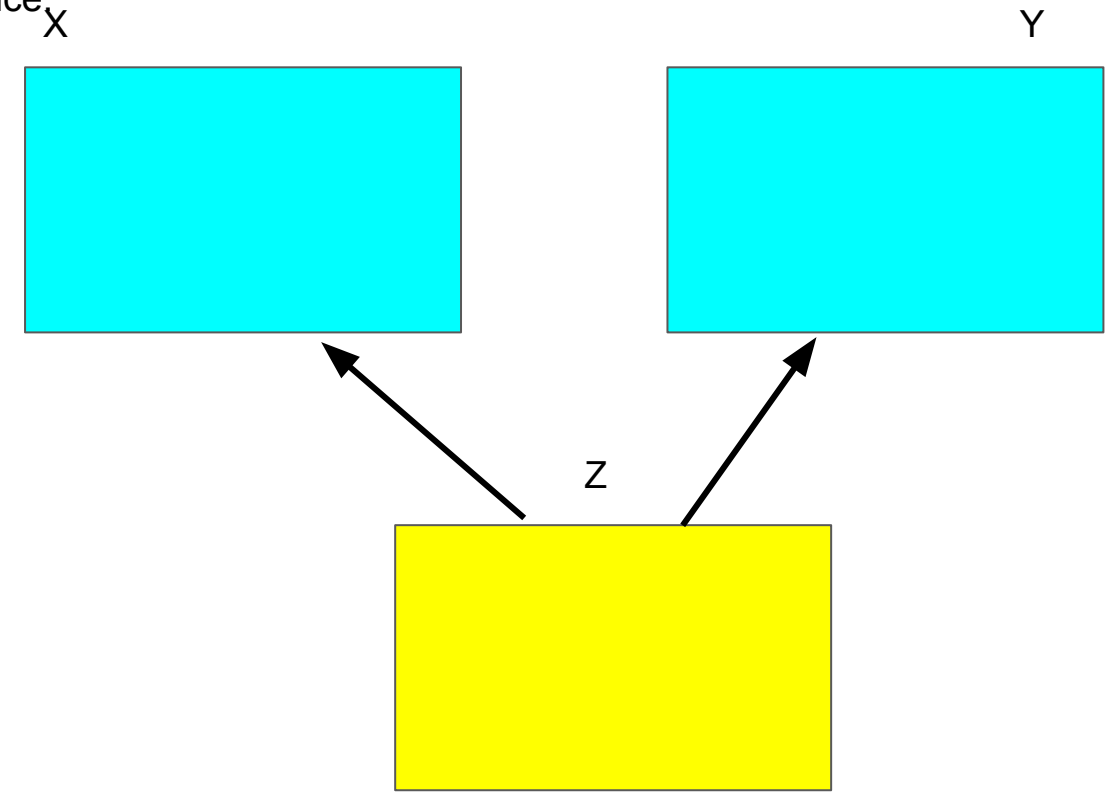
Y inherits X

Z inherits Y and X

3. HIERARCHICAL INHERITANCE :- If a parent (super class) has more than one child (subclass) in the same level then it is known as hierarchical inheritance.



MULTIPLE INHERITANCE :- If a subclass (child) has more than one parent (Super class) then it is known as multiple inheritance.

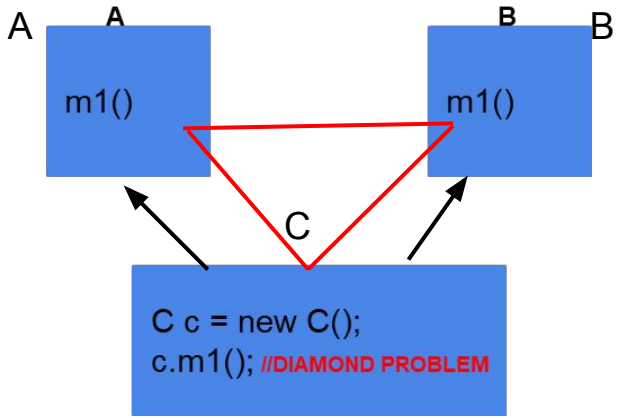


NOTE :

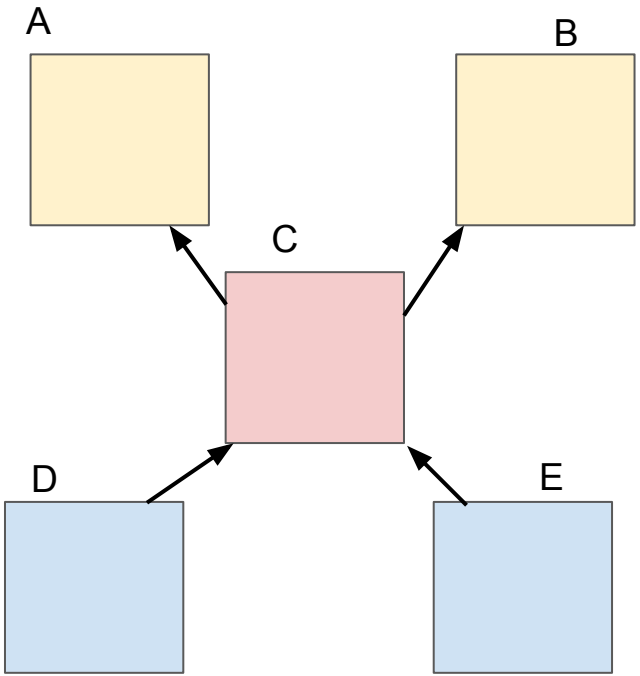
- Multiple inheritance has a problem known as diamond problem.
- Because of diamond problem , we can't achieve multiple inheritance only with the help of class.
- In java we can achieve multiple inheritance with the help of an interface.

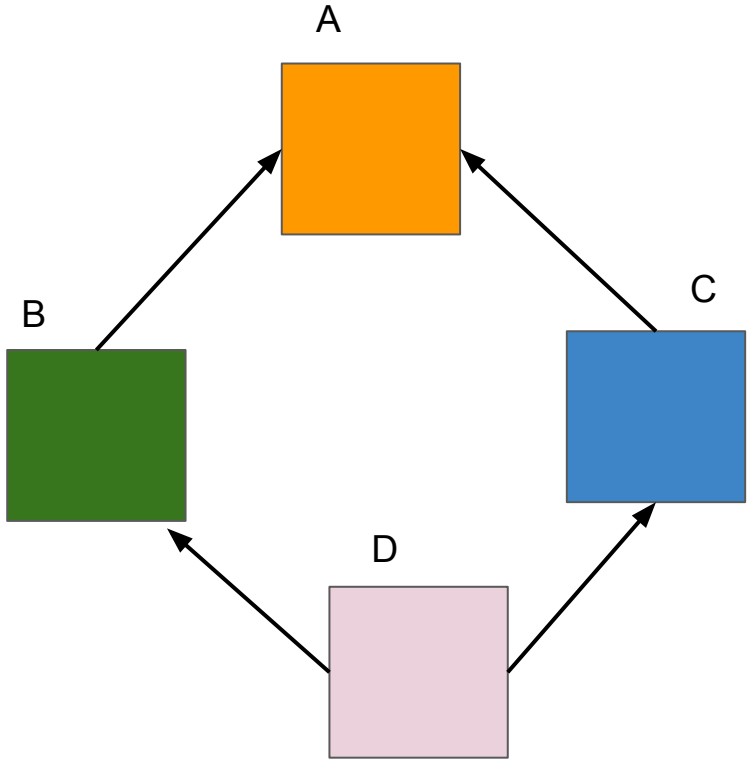
DIAMOND PROBLEM :

Assume that two classes A and B having the method with same name with same signature. If class C inherits A and B then these two methods are inherited to C (both are having a method with same signature). Whenever we create a object for c and tries to call that inherited method then which method will get executed ? This problem is known as diamond problem.



HYBRID INHERITANCE :- The combination of multiple inheritance and hierarchical inheritance is known as hybrid inheritance.





super() CALL STATEMENT :

●super is a keyword, it is used to access the members of super class.

●super() call statement is used to call the constructor of parent class from the child class constructor.

PURPOSE OF SUPER() STATEMENT :

●When the object is created, super call statement helps to load the non static members of the parent class into the child object.

●We can also use the super() call statement to pass the data from subclass to parent class.

RULE TO USE SUPER() STATEMENT

●super() call statement should always be first instruction in the constructor call.

●If a programmer doesn't use the super() call statement, then the compiler will have no argument super call statement into the constructor body.

Difference between this() and super() statements

1) this() is used to call the constructor of the same class whereas super() is used to call the constructor of the parent class(Super class).
2) this() is used to represent the instance of child class whereas super() is used to represent the instance of parent class.