Inheritance

It is one of the Oops principle where one class acquires properties of
another class with the help of 'extends' keywords is called Inheritance.
The class from where properties are acquiring/inheriting is called super/base/parent class.
The class too where properties are inherited/delivered is called sub/child class.

Inheritance takes place between 2 or more than 2 classes.

Inheritance is classified into 4 types:
        1. Singlelevel Inheritance
        2. Multilevel Inheritance
        3. Multiple Inheritance
        4. hirarchicle

1. Singlelevel Inheritance:
It is a operation where inheritance takes place between only 2 classes.
To perform singlelevel inheritance only 2 classes are mandatory.

2. Multilevel Inheritance:
Multilevel Inheritance takes place between 3 or more than 3 classes.
In Multilevel Inheritance 1 sub class acquires properties of another super class &
that class acquires properties of its another super class & phenomenon continuous.

Object class: Predefined/Readymade class
Note: Object Class is super most class in java

3. Multiple Inheritance:
1 subclass acquiring properties of 2 super classes at the same time is known as Multiple Inheritance.
Java does not support Multiple Inheritance using class because of "diamond ambiguity" problem.

Note: object class is the super most class in java
By using interface, we can achieve Multiple Inheritance.

4. Hierarchical Inheritance:
multiple sub classes can acquire properties of 1 super class is known as hierarchical Inheritance.

```
package Inheritance;
//super / base/ parent class
public class Father
{
        public void car()
        {
                System.out.println("car: Kia Seltos");
        }

        public void money()
        {
                System.out.println("money: 1L");
        }

        public void home()
        {
                System.out.println("home: 2BHK");
        }
}


package Inheritance;
//sub/ child class
public class Son extends Father
{
        public void mobile()
        {
                System.out.println("Mobile: Samsung S20");
        }

//      public void car()
//      {
//              System.out.println("car: Kia Seltos");
//      }
//
```

```java
//          public void money()
//          {
//                      System.out.println("money: 1L");
//          }
//
//          public void home()
//          {
//                      System.out.println("home: 2BHK");
//          }
}
```

```java
package Inheritance;
public class Ex1_SingleLevelInheritance
{
            public static void main(String[] args)
            {
                        Son s=new Son();
                        s.mobile();
                        s.car();
                        s.money();
                        s.home();
            }
}
```

```java
package Inheritance;
//super class
public class WhatsAppV1
{

            public void txtMsg()
            {
                        System.out.println("txt msg");
            }
}
```

```java
package Inheritance;
//super & sub class
public class WhatsAppV2 extends WhatsAppV1
{

            public void audioCalling()
            {
                        System.out.println("audio calling");
            }


//          public void txtMsg()
//          {
//                      System.out.println("txt msg");
//          }
}
```

```java
package Inheritance;
//sub class
public class WhatsAppV3 extends WhatsAppV2
{
            public void videoCalling()
            {
                        System.out.println("video calling");
            }


//          public void audioCalling()
//          {
//                      System.out.println("audio calling");
//          }
//
//          public void txtMsg()
//          {
//                      System.out.println("txt msg");
//          }
}
```

```java
package Inheritance;
public class Ex2_MultiLevelInheritance
```

```java
{
        public static void main(String[] args)
        {
                WhatsAppV3 v3=new WhatsAppV3();
                v3.txtMsg();
                v3.audioCalling();
                v3.videoCalling();
        }
}




package Inheritance;
public class Ex4_HirarchicalInheritance
{
        public static void main(String[] args)
        {
                System.out.println("-----Features of Son1-------");
                Son1 s1=new Son1();
                s1.mobile();
                s1.car();
                s1.money();
                s1.home();

                System.out.println("-----Features of Son2-------");
                Son2 s2=new Son2();
                s2.laptop();
                s2.car();
                s2.money();
                s2.home();

                System.out.println("-----Features of Son3-------");
                Son3 s3=new Son3();
                s3.car();
                s3.money();
                s3.home();
        }
}




package Inheritance;
//sub class 1
public class Son1 extends Father
{
        public void mobile()
        {
                System.out.println("Mobile: Samsung s20");
        }

//      public void car()
//      {
//              System.out.println("car: Kia Seltos");
//      }
//
//      public void money()
//      {
//              System.out.println("money: 1L");
//      }
//
//      public void home()
//      {
//              System.out.println("home: 2BHK");
//      }

}

package Inheritance;
//sub class 2
public class Son2 extends Father
{
        public void laptop()
        {
                System.out.println("Laptop: Hp");
        }

//      public void car()
//      {
//              System.out.println("car: Kia Seltos");
//      }
```

```
//
//              public void money()
//              {
//                          System.out.println("money: 1L");
//              }
//
//              public void home()
//              {
//                          System.out.println("home: 2BHK");
//              }
}


package Inheritance;
//sub class 3
public class Son3 extends Father
{
//              public void car()
//              {
//                          System.out.println("car: Kia Seltos");
//              }
//
//              public void money()
//              {
//                          System.out.println("money: 1L");
//              }
//
//              public void home()
//              {
//                          System.out.println("home: 2BHK");
//              }
}


package Inheritance;
public class Ex4_HirarchicalInheritance
{
              public static void main(String[] args)
              {
                          System.out.println("-----Features of Son1------");
                          Son1 s1=new Son1();
                          s1.mobile();
                          s1.car();
                          s1.money();
                          s1.home();

                          System.out.println("-----Features of Son2------");
                          Son2 s2=new Son2();
                          s2.laptop();
                          s2.car();
                          s2.money();
                          s2.home();

                          System.out.println("-----Features of Son3------");
                          Son3 s3=new Son3();
                          s3.car();
                          s3.money();
                          s3.home();
              }
}
```
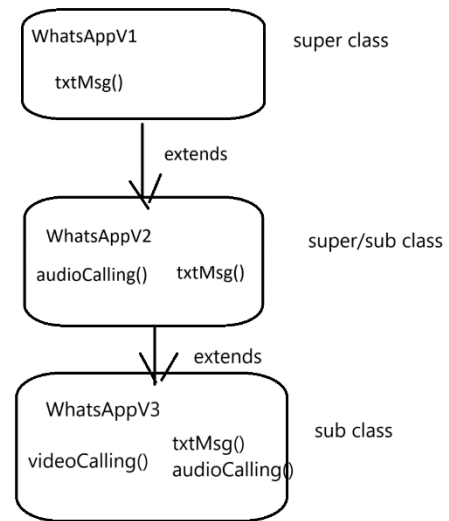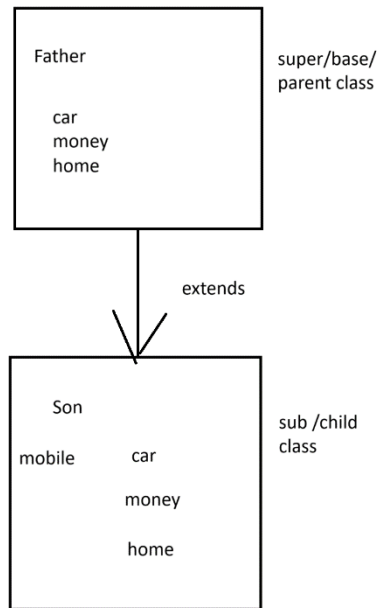
Father

super/base/
parent class

car
money
home

extends

Son

mobile   car

money

home

sub /child
class

1: Single Level Inheritance

WhatsAppV1

txtMsg()

super class

extends

WhatsAppV2

audioCalling()   txtMsg()

super/sub class

extends

WhatsAppV3

videoCalling()   txtMsg()
                   audioCalling()

sub class

super most class in java

class Object

extends

class Demo

Object

Diamond
Ambiguity
Problem

super class 2

super class 1

Sample1

m1()

Obj class
method

Sample2

m2()

obj class method

extends

sub class

Sample

3: Multiple Inheritance

super class

Father

extends

extends

Son1

Son2

Son3

sub class 1

2

3

4: Hierarchical
Inheritance