- **Name of Teacher:** Miss Nita N. Bargale
- **Class:** B.Sc. Computer Science (Entire)- III
- **Course Title:** Java programming

Inheritance

What is Inheritance?

Inheritance is a mechanism in which one class acquires the property of another class.

Or

The process by which one class acquires the properties(data members) and functionalities(methods) of another class is called **inheritance**.

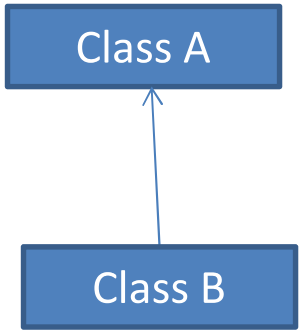
- The aim of inheritance is to provide the reusability of code so that a class has to write only the unique features and rest of the common properties and functionalities can be extended from the another class.
- **Child Class:**
  The class that extends the features of another class is known as child class, sub class or derived class.
- **Parent Class:**
  The class whose properties and functionalities are used(inherited) by another class is known as parent class, super class or Base class.
- Inheritance represents the **IS-A relationship** which is also known as a *parent-child* relationship.

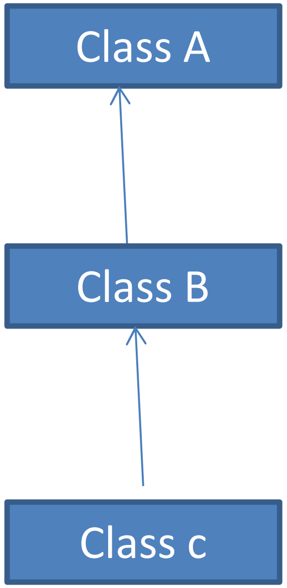
- To inherit a class we use extends keyword
- **Syntax:**
- **class** Subclass-name **extends** Superclass-name
- {
-    //methods and fields
- }
- E.g.
- class B extends A
- {
- body of class
- }
- Here class B is child class and class A is parent class.

Types of inheritance in java

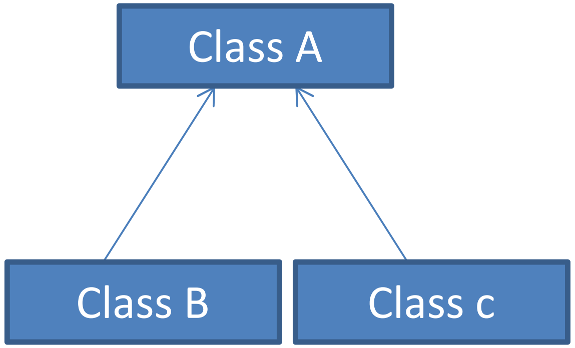
- On the basis of class, there can be three types of inheritance in java: single, multilevel and hierarchical.

1)Single





2)MULTILEVEL



3) Hierarchical.

1) **Single Inheritance:** When a derived class inherits from only one base class then it is single inheritance.

Syntax

```
    class Parent
     {
    // methods // fields // ……
    }
     class Child extends Parent
    {
     // body of class
}
```

```
class add1
{
 int add(int a , int b)
 {
return a+b;
 }
 }
public class sub1 extends add1
{
int sub(int a , int b)
 {
return a-b;
 }
}
```

```
class calulator
{
public static void main(String args[])
{
sub1 cal= new sub1();
System.out.println(cal.add(1,2));
System.out.println(cal.sub(1,2));
}
}
```

2) Multilevel Inheritance:

When a class extends to another class that also extends some other class forms a multilevel inheritance

Syntax

```
classA
{
//body  of class
}
class B extends A
{
// body of class
}
class C extends B
{
// class body of class
}
```

```
class show
{
int add(int a,int b)
{
return a+b;
}
}
class display extends show
{
int  sub(int a,int b)
{
return a-b;
}
}
```

```
class result extends display
{
int mul (int a ,int b)
{
return a*b;
}
}
class calulator
{
public static void main(String args[])
{
result  res=new result();
System.out.println(res.add(20,30) );
System.out.println(res.sub(40,30) );
System.out.println(res.mul(10,3) );
}
}
```

3) **Hierarchical Inheritance-**

When a class is extended by two or more classes, it forms hierarchical inheritance

OR

when two or more classes inherits a single class ,it is known as hierarchical inheritance syntax

```
 class parent
{
//body of class
}
class child extends parent
{
//body of class

}
class child1 extends parent
{
 //body of class
}
```

```
class show
{
int add(int a,int b)
{
return a+b;
}
}
class display extends show
{
int  sub(int a,int b)
{
return a-b;
}
```

```
class result extends show
{
int mul (int a ,int b)
{
return a*b;
}
}
class calulator
{
public static void main(String args[])
{
result  res=new result();
display  d=new display()
System.out.println(res.add(20,30) );
System.out.println(res.mul(10,3) );

System.out.println(d.add(20,20) );
System.out.println(d.sub(40,30) );
}
```