Understanding Inheritance

- Inheritance is the ability of a class inheriting data and behaviors from another class.

- It is also called "Is-A" relation.

- The main advantage of inheritance is code reusability.

- By using "extends" keyword we can implement IS-A relationship.

- After inheriting the complete functionality of super class Sub class can access the super class methods with its reference object.

Common Terminology:

Parent class   –   Child class

Base class   -   Derived class

Super class   -   Sub class

- All the data and methods which were present in parent class is by default available to child class, but the reverse is not applicable.

- Hence by using child class reference we can call both parent and child class methods.

- But by using parent reference we can call only methods available in the parent class and we can't call child class specific methods.

- Parent class reference can be used to hold child class object, but Child class reference cannot be used to hold parent class object.

- For all the java classes including predefined and user defined classes Object class acts as the super class to be precise **java.lang.Object** class is superclass of all classes.

- When a class extends another class, the subclass inherits all the public and protected members of the super class. The default members are inherited only in the same package.

- Constructors are not inherited in to the sub class during inheritance, we can call the constructors of super class by invoking super class object.

Types Of Inheritance:

- Java supports '3' types of inheritance.

  1. Single Inheritance

  2. Multi-Level Inheritance
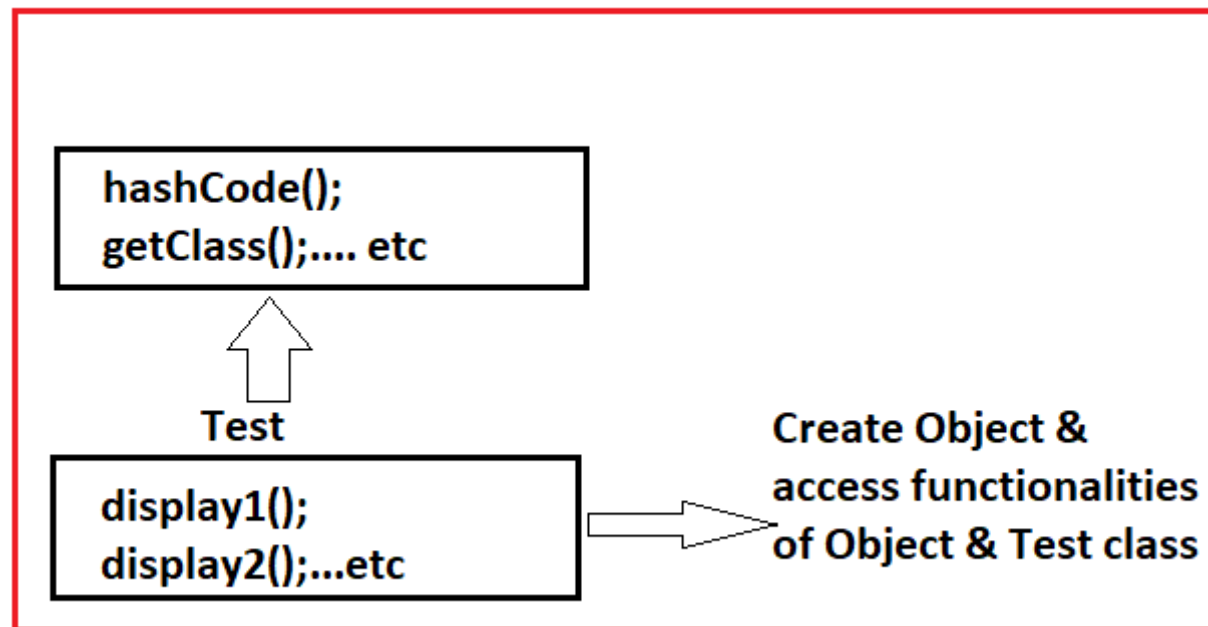
  3. Hierarchal Inheritance

Single Inheritance

- Every java class by default inherits from "java.lang.Object" class.

- By this extension only, every user object gets the behavior of real Object.

- Hence every java class exhibits by default "Single Inheritance".

- Single Inheritance enables a derived class(Sub class) to inherit properties and behavior from a single parent class
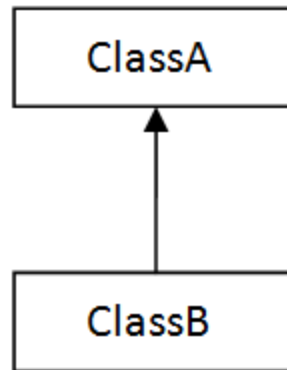
Multi-Level Inheritance

- Accessing the functionality of objects in more than one level is called "Multi-Level Inheritance".
- Child class accessing the functionality of grand parent.

```
hashCode();
getClass();.... etc
```

↑ Test

```
display1();
display2();...etc
```

→ **Create Object & access functionalities of Object & Test class**

Hierarchal Inheritance

- Sharing the properties of object to multiple child objects is called "Hierarchal Inheritance".