INHERITANCE-EXTENDING CLASSES

WHAT IS INHERITANCE

The capability of a class to derive properties and characteristics from another class is called Inheritance.

Inheritance is one of the most important feature of Object Oriented Programming.

Sub Class: The class that inherits properties from another class is called Sub class or Derived Class.

Super Class:The class whose properties are inherited by sub class is called Base Class or Super class.

SYNTAX

```
class subclass_name : access_mode base_class_name
{
  //body of subclass
};
```

VISIBILITY OF BASE CLASS MEMBERS IN DERIVED CLASS

When a class (derived) inherits from another (base) class, the visibility of the members of the base class in the derived class is as follows.

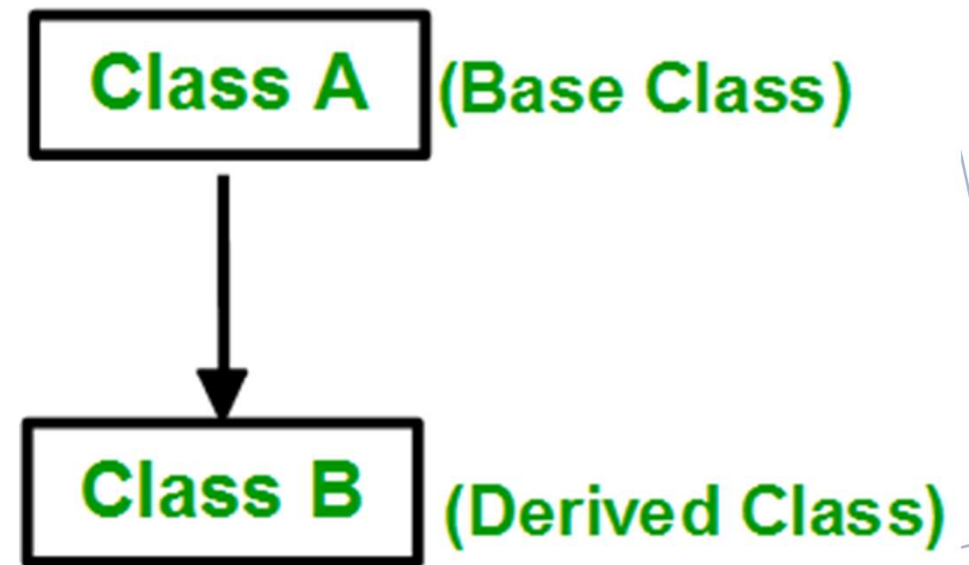Member visibility in derived class

Type of Inheritance

Member access specifier in base class	Private	Protected	Public
Private	Not Inherited	Not Inherited	Not Inherited
Protected	Private	Protected	Protected
Public	Private	Protected	Public

TYPES OF INHERITANCE

1. Single Inheritance: In single inheritance, a class is allowed to inherit from only one class. i.e. one sub class is inherited by one base class only.
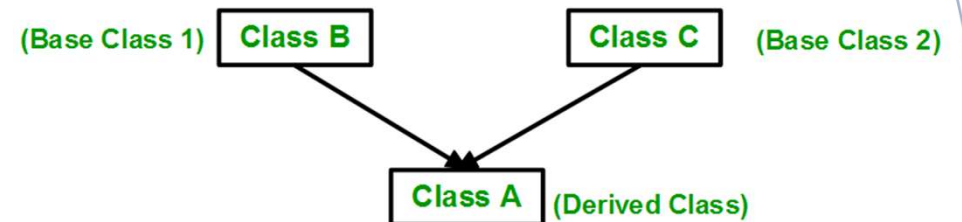
```
class subclass_name : access_mode base_class
{
  //body of subclass
};
```

Class A (Base Class)
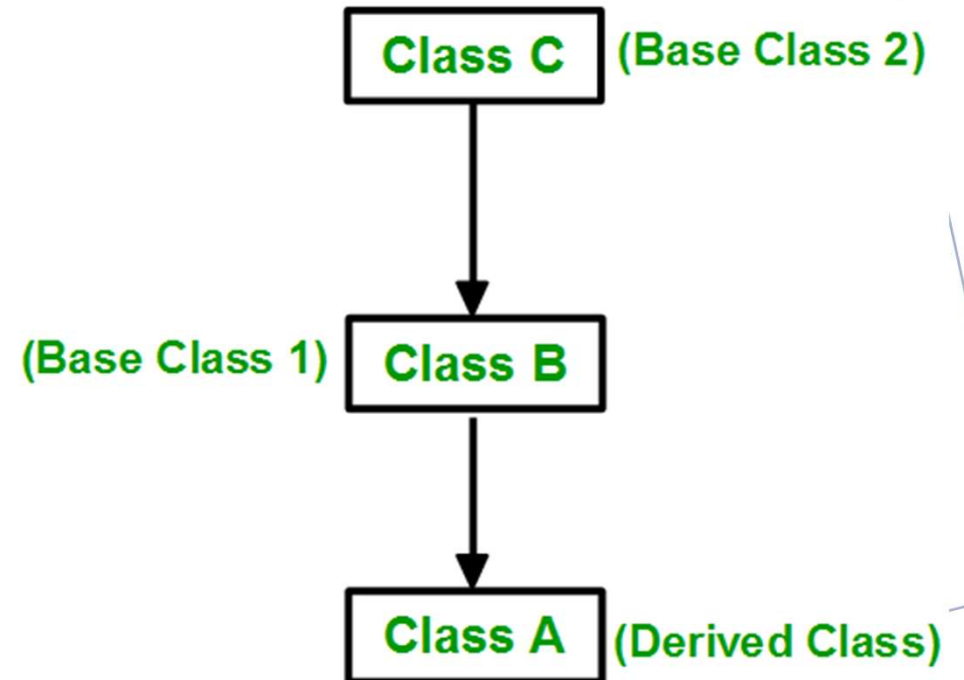
Class B (Derived Class)

TYPES OF INHERITANCE CONT.

2. **Multiple Inheritance**: Multiple Inheritance is a feature of C++ where a class can inherit from more than one classes. i.e one sub class is inherited from more than one base classes.

```
class subclass_name : access_mode
base_class1, access_mode
base_class2, ....
{
  //body of subclass
};
```
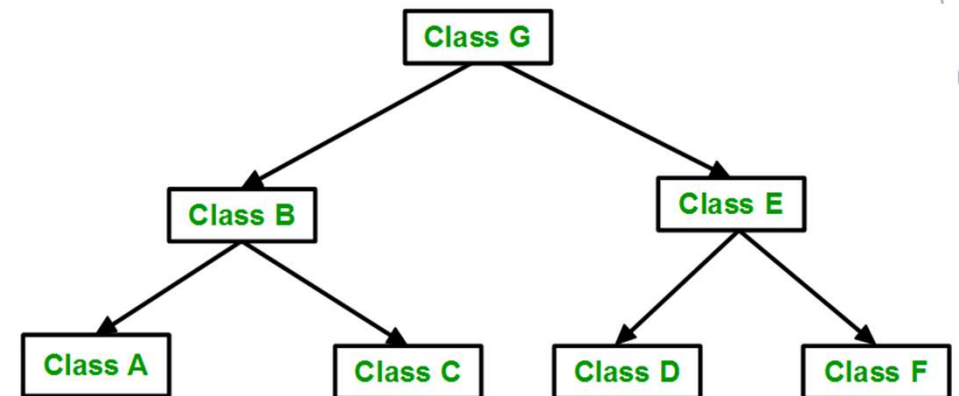
(Base Class 1) Class B   Class C (Base Class 2)

Class A (Derived Class)

TYPES OF INHERITANCE CONT.

- 3. **Multilevel Inheritance**: In this type of inheritance, a derived class is created from another derived class.

Class C (Base Class 2)

(Base Class 1) Class B
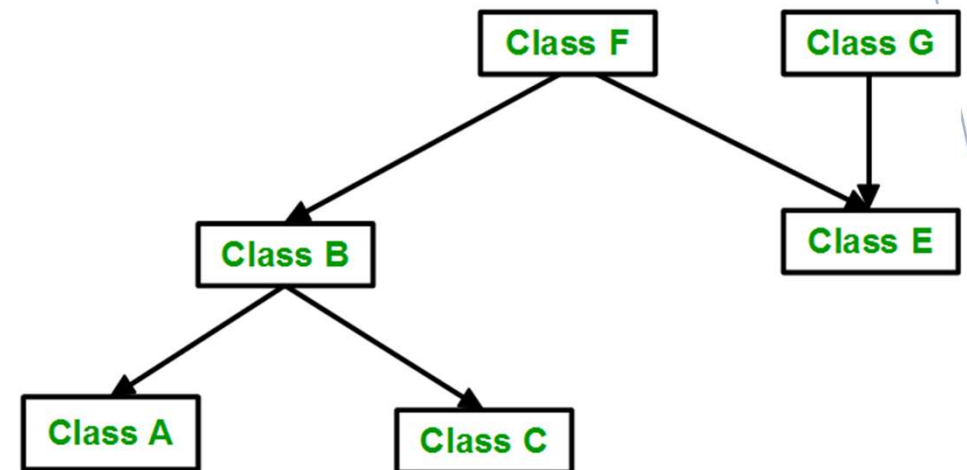
Class A (Derived Class)

TYPES OF INHERITANCE CONT.

Hierarchical Inheritance: In this type of inheritance, more than one sub class is inherited from a single base class. i.e. more than one derived class is created from a single base class.
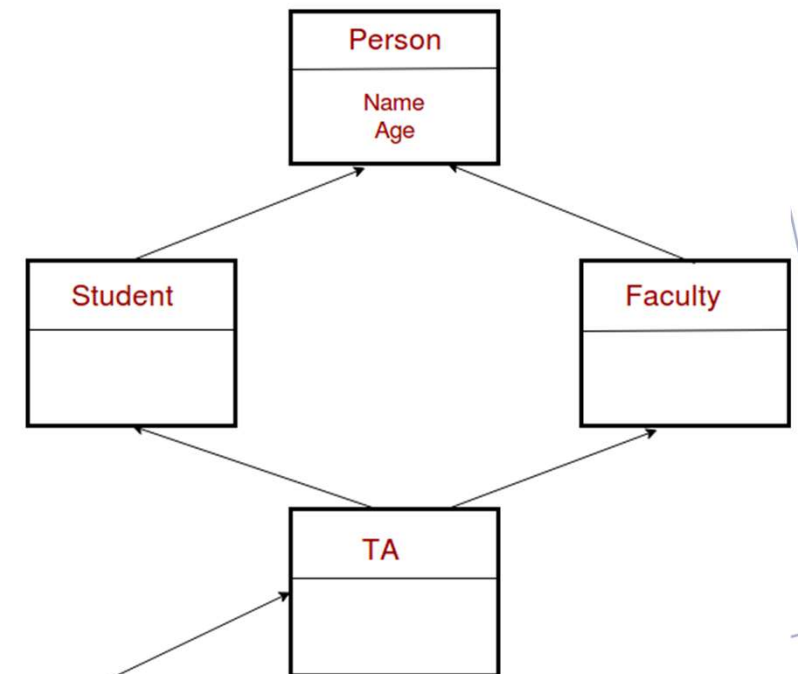
TYPES OF INHERITANCE CONT.

Hybrid (Virtual) Inheritance: Hybrid Inheritance is implemented by combining more than one type of inheritance. For example: Combining Hierarchical inheritance and Multiple Inheritance.

TYPES OF INHERITANCE CONT.

- A special case of hybrid inheritance : Multipath inheritance:
A derived class with two base classes and these two base classes have one common base class is called multipath inheritance. An ambiguity can arrise in this type of inheritance.