

# High School Programming

Lecture: 20

# WELCOME TO








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# Recap Previous Lecture

-  Access Modifiers in C#
-  Types of Access Modifiers in C#
-  Example of Access Modifiers in C#
-  Encapsulation in C#
-  Example of Encapsulation in C#

# Agenda

-  Inheritance in C#
-  Types of Inheritance in C#
-  Example of Inheritance
-  Abstraction in C#
-  Example of Abstraction

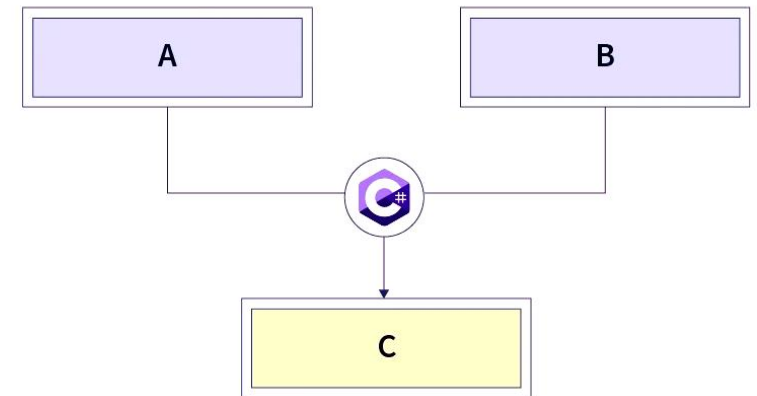
# Inheritance in C#

-- Inheritance in C# is a mechanism of consuming the members that are defined in one class from another class. See, we are aware that a class is a collection of members. The members defined in one class can be consumed by another class by establishing a parent/child relationship between the classes.

**We can group the "inheritance concept" into two categories:**

- **Derived Class (child)** - the class that inherits from another class
- **Base Class (parent)** - the class being inherited from

## Inheritance in C#



# Example of Inheritance in C#

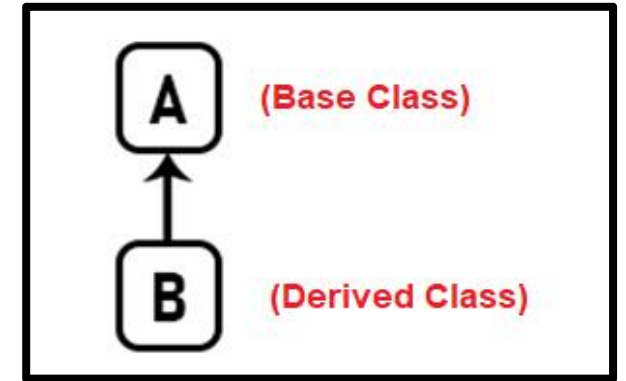
## Example:

```
class Vehicle
{
    public string brand = "Ford";
    public void honk() => Console.WriteLine("Tuut, tuut!");
}
class Car : Vehicle
{
    public string modelName = "Mustang";
}
class Program
{
    static void Main(string[] args)
    {
        Car myCar = new Car();
        myCar.honk();
        Console.WriteLine(myCar.brand + " " + myCar.modelName);
    }
}
```

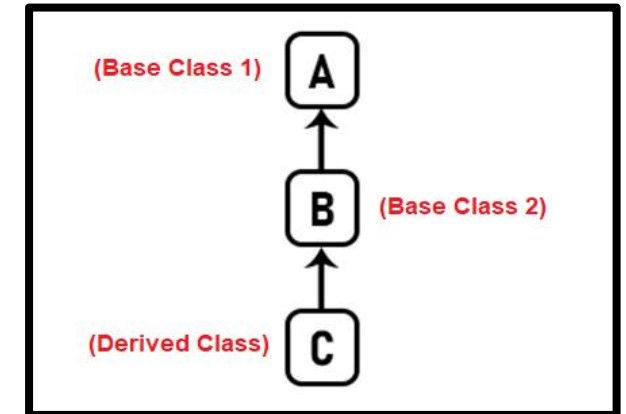
# Types of Inheritance in C#

-- There are five different types of Inheritances:

**1. Single Inheritance:** When a class is inherited from a single base class then the inheritance is called single inheritance.

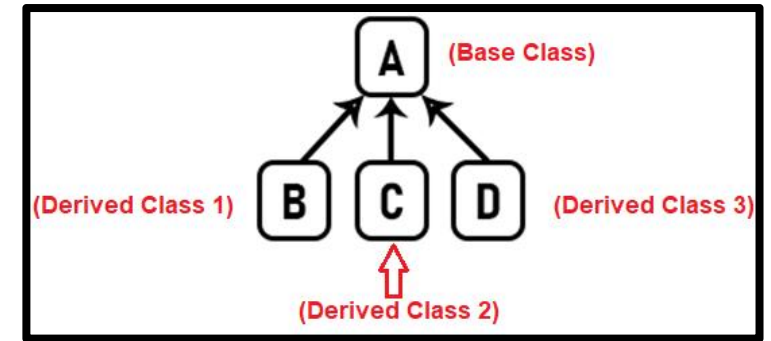


**2. Multilevel Inheritance:** When a derived class is created from another derived class, then such a type of inheritance is called Multilevel Inheritance.

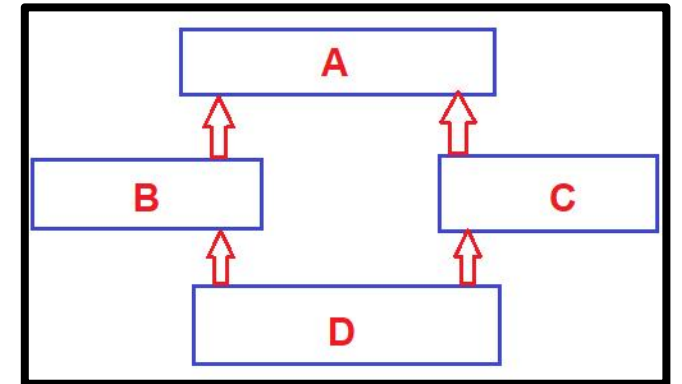


# Types of Inheritance in C#

**3. Hierarchical Inheritance:** When more than one derived class is created from a single base class then it is called Hierarchical inheritance.



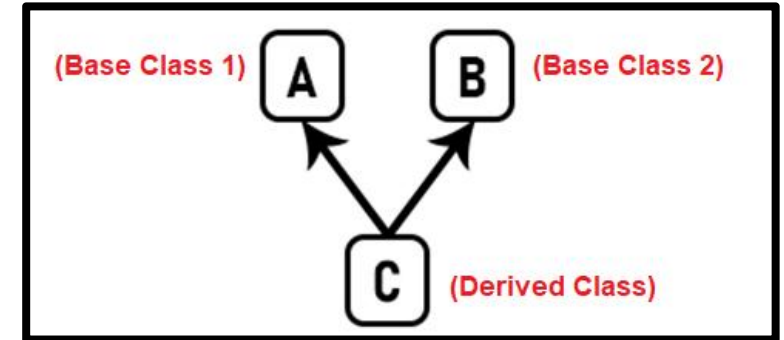
**4. Hybrid Inheritance:** Hybrid Inheritance is the inheritance that is the combination of any Single, Hierarchical, and Multilevel inheritances.





# Types of Inheritance in C#

**5. Multiple Inheritance:** When a derived class is created from more than one base class then such type of inheritance is called multiple inheritances.



# Abstraction in C#

-- The process of representing the essential features without including the background details is called Abstraction. In simple words, it is a process of defining a class by providing the necessary details to call the object operations (i.e., methods) by hiding its implementation details. It is called abstraction in C#.

**The abstract keyword is used for classes and methods:**

- **Abstract class:** It is a restricted class that cannot be used to create objects (to access it, it must be inherited from another class).
- **Abstract method:** It can only be used in an abstract class, and it does not have a body. The body is provided by the derived class (inherited from).

# Example of Abstraction in C#

## Example:

```
abstract class Animal
{
    public abstract void animalSound(); // Abstract method
    public void sleep() => Console.WriteLine("Zzz"); // Regular method
}
class Pig : Animal
{
    public override void animalSound() => Console.WriteLine("The pig says: wee wee");
}
class Program
{
    static void Main(string[] args)
    {
        Pig myPig = new Pig();
        myPig.animalSound();
        myPig.sleep();
    }
}
```

# Useful Resource



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**Thank You**