Java Constructors

A constructor in Java is a **special method** that is used to initialize objects. The constructor is called when an object of a class is created. It can be used to set initial values for object attributes:

```
// Create a MyClass class

public class MyClass {

  int x;  // Create a class attribute


  // Create a class constructor for the MyClass class

  public MyClass() {

    x = 5;  // Set the initial value for the class attribute x

  }


  public static void main(String[] args) {

    MyClass myObj = new MyClass(); // Create an object of class MyClass
(This will call the constructor)

    System.out.println(myObj.x); // Print the value of x

  }

}
```

Constructor Parameters

Constructors can also take parameters, which is used to initialize attributes.

The following example adds an `int y` parameter to the constructor. Inside the constructor we set x to y (x=y). When we call the constructor, we pass a parameter to the constructor (5), which will set the value of x to 5:

```
public class MyClass {
  int x;

  public MyClass(int y) {
    x = y;
  }

  public static void main(String[] args) {
    MyClass myObj = new MyClass(5);
    System.out.println(myObj.x);
  }
}

// Outputs 5
```

Java Inheritance (Subclass and Superclass)

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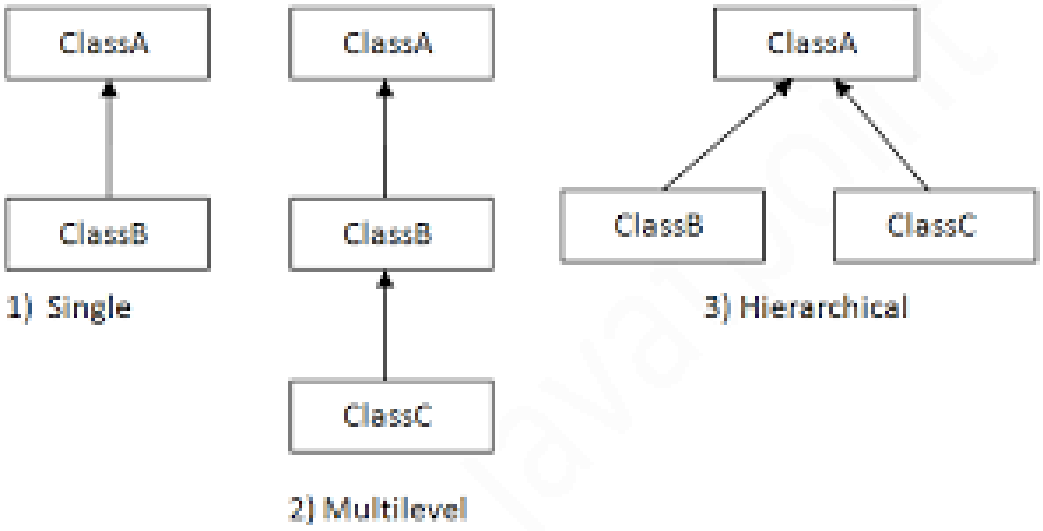
In Java, it is possible to inherit attributes and methods from one class to another. We group the "inheritance concept" into two categories:

- **subclass** (child) - the class that inherits from another class
- **superclass** (parent) - the class being inherited from



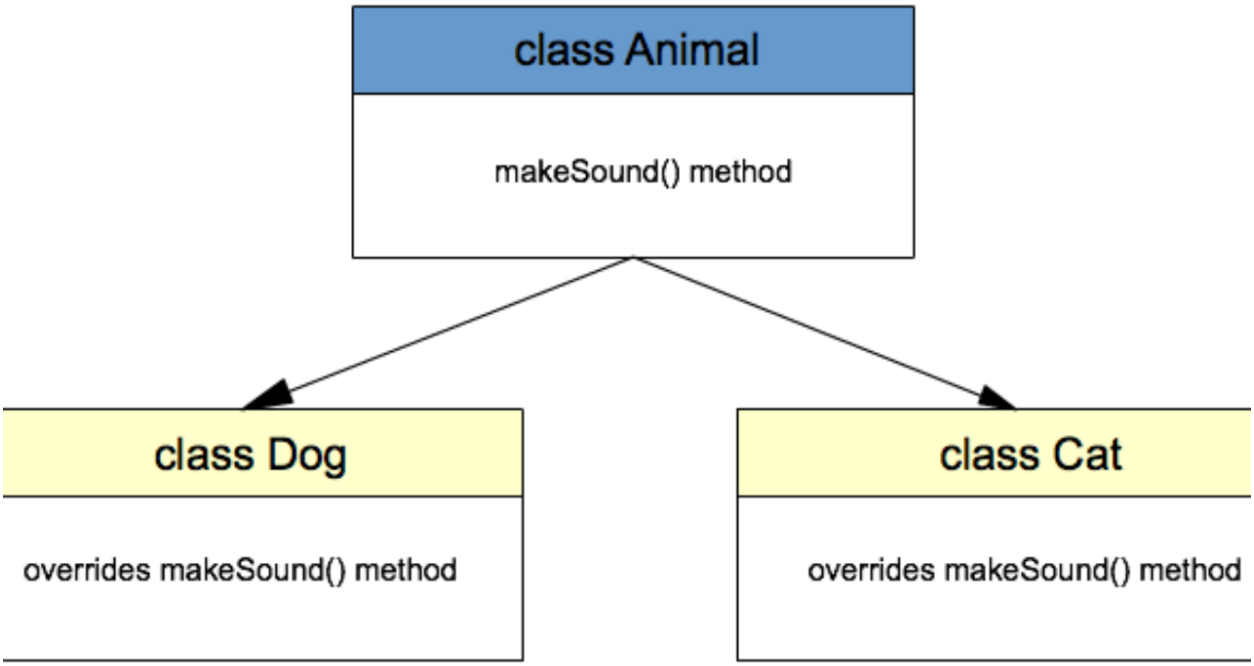
To inherit from a class, use the `extends` keyword.

```
class Vehicle {
  protected String brand = "Ford";         // Vehicle attribute
  public void honk() {                     // Vehicle method
    System.out.println("Tuut, tuut!");
  }
}

class Car extends Vehicle {
  private String modelName = "Mustang";    // Car attribute
  public static void main(String[] args) {

    // Create a myCar object
    Car myCar = new Car();

    // Call the honk() method (from the Vehicle class) on the myCar object
```

```
    myCar.honk();


    // Display the value of the brand attribute (from the Vehicle class)
and the value of the modelName from the Car class

    System.out.println(myCar.brand + " " + myCar.modelName);

  }

}




final class Vehicle {

  ...

}


class Car extends Vehicle {

  ...

}
```

Java Polymorphism

Polymorphism means "many forms", and it occurs when we have many classes that are related to each other by inheritance.



Like we specified in the previous chapter; **Inheritance** lets us inherit attributes and methods from another class. **Polymorphism** uses those methods to perform different tasks. This allows us to perform a single action in different ways.

For example, think of a superclass called `Animal` that has a method called `animalSound()`. Subclasses of Animals could be Pigs, Cats, Dogs, Birds - And they also have their own implementation of an animal sound (the pig oinks, and the cat meows, etc.):

```
class Animal {

  public void animalSound() {

    System.out.println("The animal makes a sound");
```

```
  }
}

class Pig extends Animal {
  public void animalSound() {
    System.out.println("The pig says: wee wee");
  }
}

class Dog extends Animal {
  public void animalSound() {
    System.out.println("The dog says: bow wow");
  }
}

class MyMainClass {
  public static void main(String[] args) {
    Animal myAnimal = new Animal();  // Create a Animal object
    Animal myPig = new Pig();  // Create a Pig object
    Animal myDog = new Dog();  // Create a Dog object
    myAnimal.animalSound();
    myPig.animalSound();
    myDog.animalSound();
  }
}
```