Chapter 10 - Inheritance

Inheritance is used to borrow properties & methods from an existing class

| Phone | → | SmartPhone |

| SuperClass | → | SubClass | Subclass extends SuperClass

Declaring Inheritance in Java

Inheritance in Java is declared using extends keyword

| Superclass |
↓
| Subclass | ⇒ Subclass extends the Superclass

More Examples

Vehicle   Animal   Animal   Vehicle
↓   ↓   ↓   ↓
Car   Dog   Cat   Truck

When a class inherits from a superclass, it inherits parts of superclass methods and fields.
Java doesn't support multiple inheritance ie two classes Cannot be super classes for a subclass.

Code Example

Inheritance in Java is declared using extends keyword

```
public class Dog extends Animal  {→ Inheriting Dog from
        // Code                      Animal Class!!
    }
```

Quick Quiz : Create a class Animal and Derive another class Dog from it.

Constructors in Inheritance

When a Derived class is extended from the Base class, the constructor of the Base class is executed first followed by the constructor of the derived class.

For the following Inheritance hierarchy, the constructors are executed in the order ① → ② → ③

C_1 → Parent

↓

C_2 → child

↓

C_3 → Grand child

↓ constructors execute in top to bottom order !

Constructors during Constructor Overloading

When there are multiple constructors in the parent class, the constructor without any parameters is called from the child class.

If we want to call the constructor with parameters from the parent class, we can use Super keyword

Super (a, b); → Calls the constructor from the parent class which takes 2 variables

this keyword

this is a way for us to reference an object of the class which is being created/referenced.

this.area = 2 → this is a reference to current object

Super Keyword

A reference variable used to refer immediate parent class object

→ Can be used to refer immediate parent class instance variable
→ Can be used to invoke parent class methods.
→ Can be used to invoke parent class constructors.
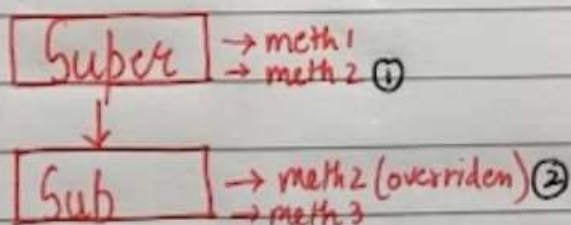
Method Overriding

If the child class implements the same method present in the parent class again, it is known as method overriding

↳ Redefining method of super class!
(in sub class)

When an object of subclass is created and the overrided method is called, the method which has been implemented in the subclass is called & its code is executed.

Dynamic method dispatch

Consider the following inheritance hierarchy

Super → meth1
→ meth2 ①

↓

Sub → meth2 (overriden) ②
→ meth3

Scenario 1 → Super obj = new Sub() → Allowed ⊘
obj. meth2() → ② is called (method of object)
obj. meth3() → Not Allowed ⊗

Scenario 2 → Sub obj = new Super() → Not Allowed ⊗