Object Oriented Programming

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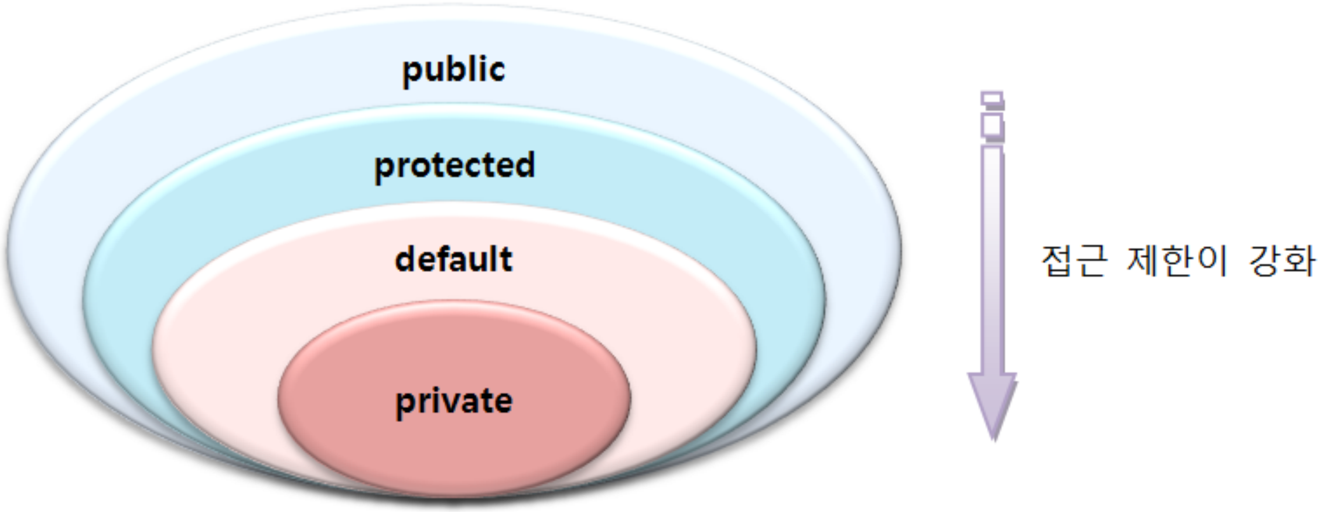
Java Class Type (Roughly)

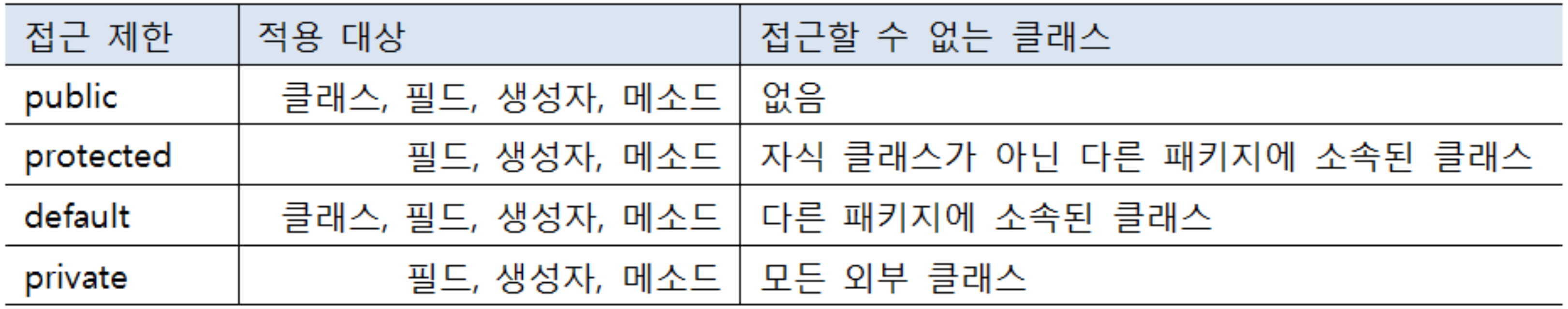
- Application Program Interface (API)/Library class
  - A class generally used to create an instance from the class definition
  - EX: Class Car
- Execution class
  - It provides a program starting point (main)
  - It has multiple other objects that are going to be utilized during execution

Access Modifiers of Class Members

- An object created from a class declaration is to be used by other objects (methods) : library
- When an object is being used by other objects, we can specify how fields/methods can be accessed
  - Some fields value need to be private so that other object cannot read and/or write
  - Some methods might be modifiable and/or callable
- Access modifiers of Java
  - public, protected, default, private

Access Modifiers in a Picture





접근 제한	적용 대상	접근할 수 없는 클래스
public	클래스, 필드, 생성자, 메소드	없음
protected	필드, 생성자, 메소드	자식 클래스가 아닌 다른 패키지에 소속된 클래스
default	클래스, 필드, 생성자, 메소드	다른 패키지에 소속된 클래스
private	필드, 생성자, 메소드	모든 외부 클래스

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Access Modifier for Fields and Methods

- For fields/methods in a class, we have to decide
    - They can be accessed only within the class (instance members)
    - They can be used only within a same package
        - Note that a package is a logical set (superset) of classes
    - They can be accessed by any classes
- Declaring a field with access modifiers
    - ACCESS_MODIFIER VARIABLE_TYPE VARIABLE_NAME
    - EX: private int age;
- Declaring a method with access modifiers
    - ACCESS_MODIFIER RETURN_TYPE METHOD_NAME
    - EX: public void startEngine();

Access Ranges

- public
  - All fields and methods can be utilized from any other classes
- protected
  - All fields and methods in a same package can use it
  - All child class can use parent class's members
- default
  - Similar to protected, but a child class from a different package of a parent class cannot access it
- private
  - The fields/methods can be accessed only within the class

Best Practice for Setting Access Modifier

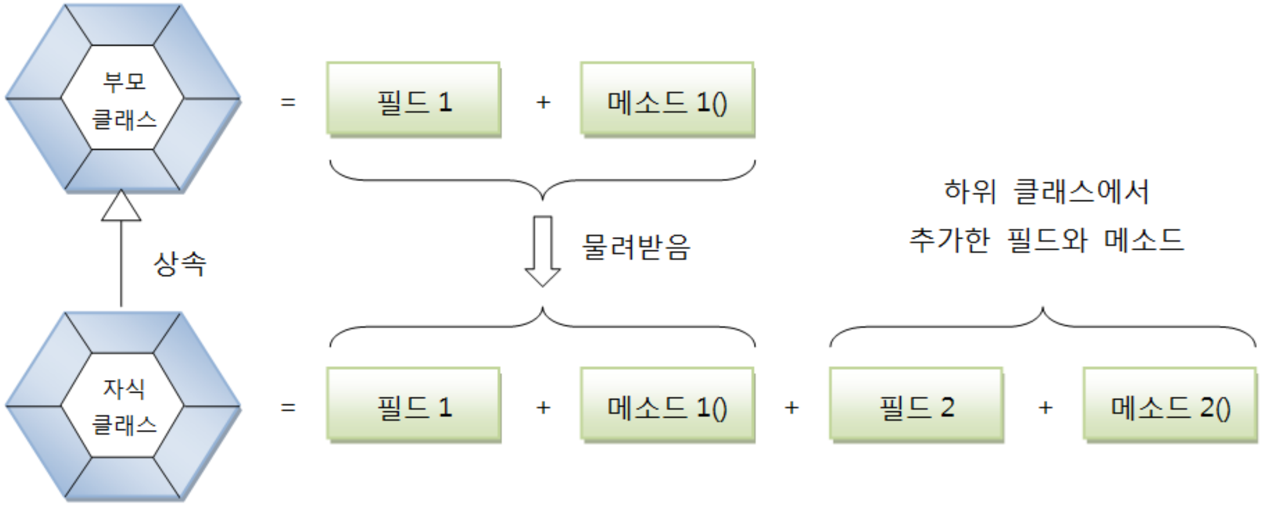
- If methods need to be accessed from another class object
  - Declare it as public
- If methods do not need to be accessed externally
  - Declare it as private
- Same principle applies to fields
  - However, it is highly recommended to set fields as private variable and provide a public method to access the field
  - Constant value field can be set public member

Getter and Setter Method for Fields

- Why setting fields as private and provide public method
  - To guarantee integrity of field value
  - Imagine what happens an external object sets a field (age) as negative? We can avoid such scenario (by sanity checking)
- Getter method
  - Allows an external method to read a private field
  - By convention, getter name starts with ″is″ (boolean) or “get″ (except boolean)
- Setter method
  - Allows an external method to set a private field
  - Performs sanity check
  - By convention, setter name start with “set″

Inheritance

- In reality, inheritance means handing in legacies from parent to children
- In OOP, it lets fields and methods of parent class to be used in a child class
  - A child class can inherit from a parent class



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Advantages of Inheritance

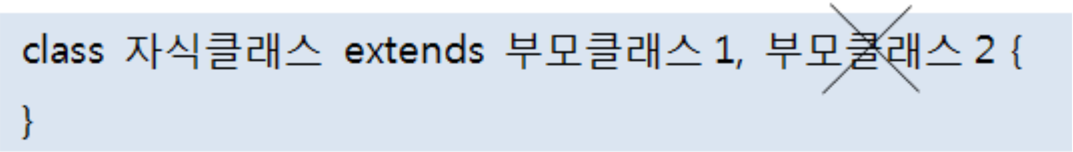
- A child class reuses methods/fields declared by the parent class
- Avoid code duplication
  - Code reuse
- Good for maintenance
  - Fixing a method from a parent class can be reflected to child classes automatically
- Polymorphism
  - Same signature but different code body

Access Modifier in Inheritance

- Remember private access modifier
  - A child class cannot access private fields/methods
  - If a parent class is located in another package, default access modifier fields/methods cannot be accessed
- Remember that protected access modifier should be used to allow child classes to access parent class's fields/methods

Class Inheritance – How To

- Keyword – extends
- Syntax
  - ACCESS_MODIFIER CLASS_NAME extends PARENT_CLASS_NAME
  - EX: public ChildClass extends ParentClass {}
- A child class chooses from which parent class to inherit
- No multiple inheritance
  - A child class cannot inherit from multiple parent classes – only one parent class
- Exercise
  - CellPhone and SmartPhone



class 자식클래스 extends 부모클래스 1, ~~부모클래스~~ 2 {

}

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