# Object Oriented Programming

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# Announcements

- A short survey about the exam in English
  - https://goo.gl/forms/ClbWERqrhBn61hIj1
- The second live coding test is scheduled on the week 10 Wednesday – Nov. 1st
  - The third one going to happen on the week 13
- The fourth homework
  - https://classroom.github.com/a/MyNSWTFz
  - Due: Nov. 5th

# Method Overloading

- Overloading
  - Multiple methods with a same name can be defined with different arguments
  - One of argument types, the number of arguments, the order should be different
  - Return type does not matter
  - It allows reusing a method name with different types

```java
int plus(int x, int y) {
    int result = x + y;
    System.out.println("Two int variables sum");
    return result;
}

double plus(double x, double y) {
    double result = x + y;
    System.out.println("Two double variables sum");
    return result;
}
```

```java
int sum1 = calculator.plus(3, 10);
double sum2 = calculator.plus(2.5, 5.1);
```

# Class Constructor

- A constructor is executed when a "new" keyword is called
- It is responsible for initialization of an object
  - Field value initialization
  - Calling methods to create another object
- Upon successful execution of constructor, an object is created in a heap region and the address is stored in a stack region
- Default constructor
  - If a constructor is not declared, a default constructor (empty body with no arguments) is executed by default

# Constructor Overloading

- Similar to method overloading (having multiple methods with a same name but with different arguments), class constructor can also be overloaded
  - Either number of arguments, variable types, or order of variable types should be different

# This Keyword Example

```java
public class InstanceThis {
    String model;
    int speed;

    InstanceThis(String model) {
        this.model = model;
    }

    void setSpeed(int speed) {
        this.speed = speed;
    }
}
```

# Java Package

- In reality, a Java application is composed of 100s ~ 1000s of classes that is really hard to manage well in the unit of class
- As we use folder (directory) to better manage multiple files, we use package to manage multiple classes
- Directory is managed in hierarchy
  - Package is also managed in hierarchy
- A same file name can exist in different directories
  - A same class name can exist in different packages

# Static Member

- Meaning of static
  - Not changing (정적)
  - Antonym of dynamic
- In Java, static members belongs to a class, but they can be used without creating an object
- Static field and static method
- Object fields are stored in Heap
- Static fields are stored in the method area
  - Stack, Heap, Method area

# Final Keyword in Class

- final keyword
  - As "final" implies, the keyword indicates the final value of a field
  - A field that is declared with final keyword should be initialized in the constructor or declaration
  - The value cannot be changed afterwards
  - A variable that cannot be changed should be declared the final keyword
    - EX: Person class's birth year

# Having Constant

- Constant
  - A variable that does not change its value in a program
  - As the value does not change, it is recommended to use final keyword
  - In general, constant is sharable among different objects – use static keyword
  - By convention, constant name should be written in CAPITAL where different words are separated by underscore _

# References

- 이것이 자바다 – 한빛미디어 2015