Agenda

- static
- Association
- ~~Inheritance~~

static Keyword

- In OOP, static means "shared" i.e. static members belong to the class (not object) and shared by all objects of the class.
- Static members are called as "class members"; whereas non-static members are called as "instance memebers".
    - 1. static fields
    - 2. static methods
    - 3. static block
    - 4. static import
- Note that, static local variables cannot be created in Java.

1. static Fields

- Copies of non-static/instance fields are created one for each object.
- Single copy of the static/class field is created (in method area) and is shared by all objects of the class.
- Can be initialized by static field initializer or static block.
- Accessible in static as well as non-static methods of the class.
- Can be accessed by class name or object name outside the class (if not private). However, accessing via object name is misleading (avoid it).
- eg :
    - Integer.SIZE
- Similar to field initializer, static fields can be initialized at declaration.

2. Static methods

- These Methods can be called from outside the class (if not private) using class name or object name. However, accessing via object name is misleading (avoid it).
- When we need to call a method without creating object, then make such methods as static.
- Since static methods are designed to be called on class name, they do not have "this" reference. Hence, they cannot access non-static members in the static method (directly), However, we can access them on an object reference if created inside them.
- eg:
    - Integer.valueOf(10);
    - Factory Methods -> to cretae object of the class

static Field Initializer

- Similar to field initializer, static fields can be initialized at declaration.

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```
static double roi = 5000.0;
// static final field -- constant
static final double PI = 3.142;
```

static Initializer Block

- Like Object/Instance initializer block, a class can have any number of static initialization blocks, and they can appear anywhere in the class body.
- Static initialization blocks are executed in the order their declaration in the class.
- A static block is executed only once when a class is loaded in JVM.

static import

- To access static members of a class in the same class, the "ClassName." is optional.
- To access static members of another class, the "ClassName." is mandetory.
- If need to access static members of other class frequently, use "import static" so that we can access static members of other class direcly (without ClassName.).

Singleton Design Pattern

- Singleton is a design pattern.
- Singleton class is a class whose single object is created throughout the application.
- To make a singleton class in Java
- step 1: Write a class with desired fields and methods.
- step 2: Make constructor(s) private.
- step 3: Add a private static field to hold instance of the class.
- step 4: Initialize the field to single object using static field initializer or static block.
- step 5: Add a public static method to return the object.

Association

- If "has-a" relationship exist between the types, then use association.
- To implement association, we should declare instance/collection of inner class as a field inside another class.
- There are two types of associations
    - 1. Composition
    - 2. Aggregation

Composition

- Represents part-of relation i.e. tight coupling between the objects.
- The inner object is essential part of outer object.
- Heart is part of Human.
- Engine is part of Car.
- Wall is part of Room.
- joining date is a part of employee

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Aggegration

- Represents has-a relation i.e. loose coupling between the objects.
- The inner object can be added, removed, or replaced easily in outer object.
- Car has a Driver.
- Company has Employees.
- Room has a window
- Employee has a vehicle

Assignment

- Create an employee class and provide the funtunalities
    1. accept
    2. display
    3. display all emps
    4. find emp by id
- creata an array of emps and provide a mebu driven code for the same requirement. Refer the Day06_images file for the same

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