Section 8 Handout

Sharing

- **Singleton** : Only one object exists at runtime
  - Use private constructor to prevent others from creating more objects
  - Implementation:
    1. Eager Initialization: creates the instance when the class is loaded to guarantee availability
    2. Lazy Initialization: only creates the instance once it's needed to avoid unnecessary creation

- **Interning** : Only one object **with a particular abstract value** exists at runtime
  - Saves memory by compacting multiple copies

Factories: Enable program to return a subtype of the class they belong to

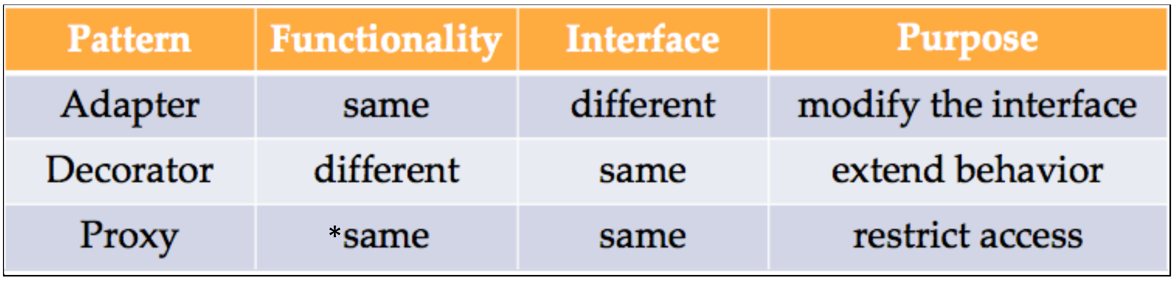
- **Factory Method**
  - A method that creates and returns objects
  - Method defines object interface, subclass instantiate
- **Factory Object**
  - Abstract superclass defines what can be customized
  - Concrete subclass completes and returns appropriate subclass

Builder

- The class uses the Builder from inner class instead of the constructor
- Useful when you have many constructor parameters and want to allow optional parameters

Structural Patterns

- **Adapter**: Turn different types of input and interface to the same functionality.
- **Decorator**: Adds (sometimes remove) existing functionalities
- **Proxy**: Providing the same functionality while adding additional features on accessing.



Pattern	Functionality	Interface	Purpose
Adapter	same	different	modify the interface
Decorator	different	same	extend behavior
Proxy	*same	same	restrict access

*Functionality is same from user perspective but different inside