

COMP 504: Graduate Object-Oriented Programming and Design

Lecture 9: Singleton Design Pattern and Design Review

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<https://www.clear.rice.edu/comp504>



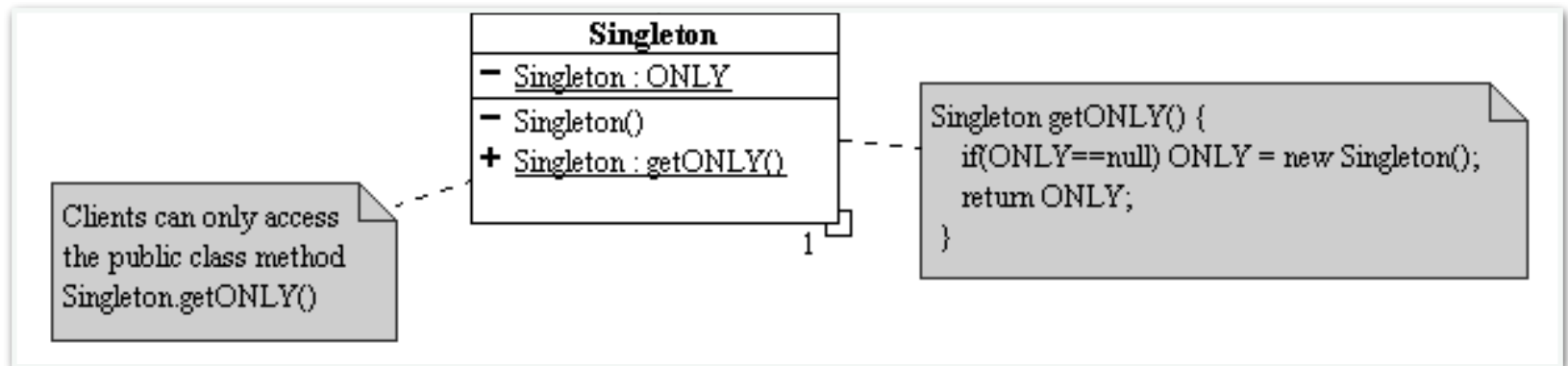
<select>

- Dropdown box instead of a button
- Allows user the ability select option(s)
 - By default, user can select one option
 - Has attribute *multiple* to select multiple options.
- Use *<option>* tag inside *<select>* to specify choices
- To get the values: `$("#slt-id").val()`



Singleton Design Pattern

- The *singleton* design pattern is used when only 1 instance of the class is needed
- The constructor is made *private* to prevent users from creating more than 1 instance
 - use public static method (e.g. `getONLY`) to access instance
- Static field `ONLY` is not automatically initialized



Why would it be beneficial to have only 1 instance of a class?



Singleton Design Pattern Principles

- Only create 1 instance of some class if needed
 - represents null or empty
 - centralized objects (global accumulator)
 - objects with no state (fields)
- Restrict users from creating multiple instances
 - constructor must be private
- Use public method to provide access to single instance
 - needs to be static since users are restricted from creating a class instance



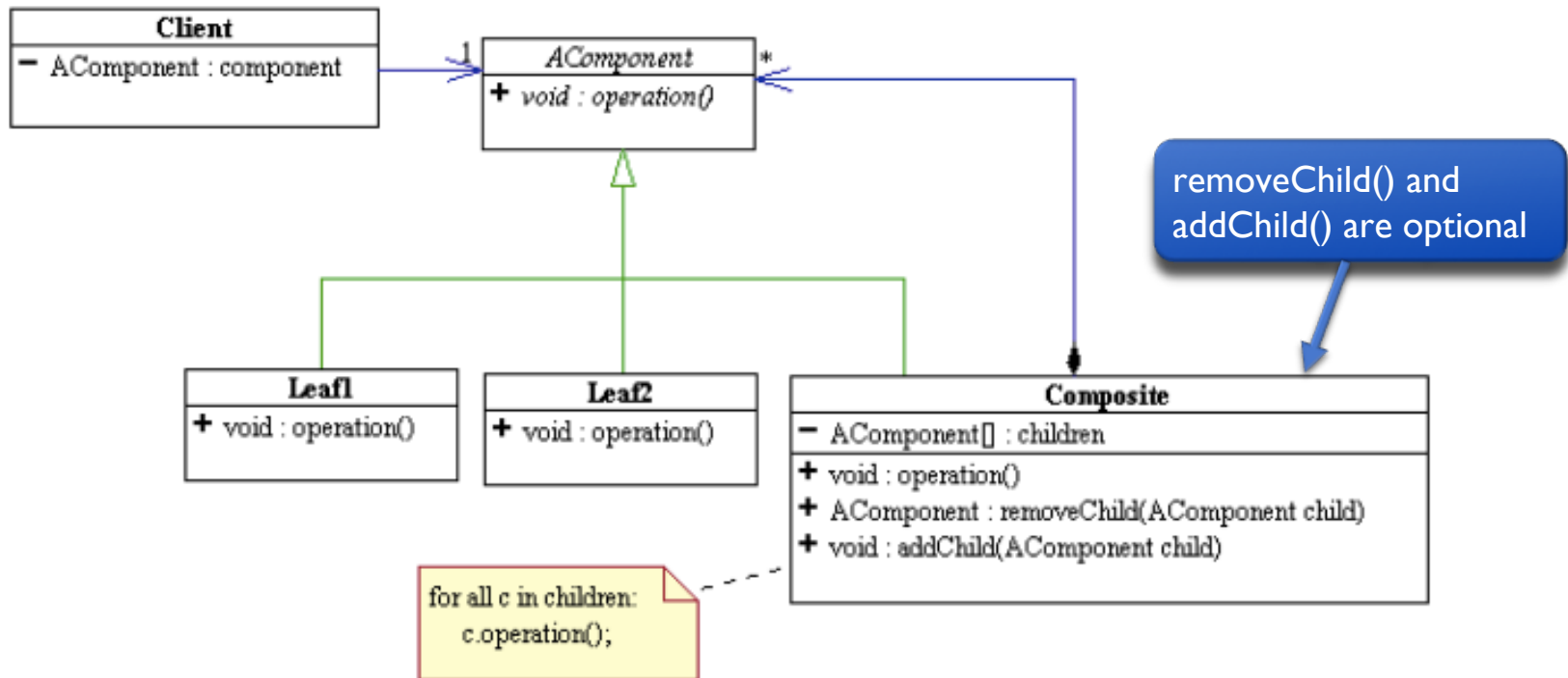
Strategy Design Pattern

How would you change the ball class(es) to use the strategy design pattern?



Composite Design Pattern (Strategy)

- Composite has a collection of leaf objects extending abstract class
- Composite *operation* is a function that *only* iterates through each child operation



Use Cases

- A use case is an example of how a user might interact with an application
- Design and develop an application by collecting as many use cases as possible
- Use case set informs developer what interfaces are needed to build system



Worksheet #6: Strategy Ball World View Design

Design Specification:

- Make balls with strategies
- Switch strategies
- Some balls may not switch strategies (not switchable)



Announcements & Reminders

- HW #2 due Friday, Sept 18th at 11:59pm
- Quiz #2 available Wednesday, due Wednesday, Sept 23 at 11:59pm

