CSCI 253

Object Oriented Design:
Behavioral Patterns
George Blankenship

Overview

Creational Patterns
- Singleton
- Abstract factory
- Factory Method
- Prototype
- Builder

Structural Patterns
- Composite
- Façade
- Proxy
- Flyweight
- Adapter
- Bridge
- Decorator

Behavioral Patterns
- Chain of Respons.
- Command
- Interpreter
- Iterator
- Mediator
- Memento
- Observer
- State
- Strategy
- Template Method
- Visitor

The Elements of a Design Pattern

- A pattern name
- The problem that the pattern solves
  - Including conditions for the pattern to be applicable
- The solution to the problem brought by the pattern
  - The elements (classes-objects) involved, their roles, responsibilities, relationships and collaborations
  - Not a particular concrete design or implementation
- The consequences of applying the pattern
  - Time and space trade off
  - Language and implementation issues
  - Effects on flexibility, extensibility, portability

Behavioral Patterns

- The **Observer** pattern defines the way a number of classes can be notified of a change,
- The **Mediator** defines how communication between classes can be simplified by using another class to keep all classes from having to know about each other.
- The **Chain of Responsibility** allows an even further decoupling between classes, by passing a request between classes until it is recognized.
- The **Template** pattern provides an abstract definition of an algorithm, and
- The **Interpreter** provides a definition of how to include language elements in a program.
- The **Strategy** pattern encapsulates an algorithm inside a class,
- The **Visitor** pattern adds function to a class,
- The **State** pattern provides a memory for a class's instance variables.
- The **Command** pattern provides a simple way to separate execution of a command from the interface environment that produced it, and
- The **Iterator** pattern formalizes the way we move through a list of data within a class.

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Problems

- Download Cooper's examples (http://www.patterndepot.com/put/8/JavaPatterns.ZIP)
- Select one of the patterns
  - **Observer** pattern, **Mediator** pattern, **Chain of Responsibility** pattern, **Template** pattern, **Interpreter** pattern, **Strategy** pattern, **Visitor** pattern, **State** pattern, **Command** pattern, and **Iterator** pattern
  - Explain the example supplied by Cooper

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