Lecture 16: Design Patterns

Viewing problems and solutions in context

Thinking of Solutions

Thinking of Problems

An Architectural Pattern

Design Patterns Defined

“Each pattern describes a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same way twice”

**Pattern Principles**

+ Encapsulate variance
+ Abstract the invariant
+ Favor composition

**Design Patterns Designed**

+ Pattern Name
+ Intent
+ Problem/Motivation
+ Solution
+ Participants & Collaborators
+ Consequences
+ Implementation

**Strategy**

+ **Intent:** Encapsulate each of a family of behaviors such that the use of the behaviors varies independently of the client.
+ **Motivation:** Remember the animals...

**Null Object**

+ **Intent:** Provide an object as a surrogate for the lack of an object of a given type.
+ **Motivation:** Sometimes the correct behavior is to do nothing. However, collaborators should be able to treat “non-behaviors” and behaviors uniformly.
Command

+ **Intent**: Encapsulate a request or action as an object.

+ **Motivation**: Sometimes we need to issue commands without knowledge of the specifics of any command – a menu is a good example.