Slide 1

Beta Release Retrospective

Sustain: **Improve:**

Slide 2

Lecture 16: Design Patterns

Viewing problems and solutions in context

Slide 3

Student
Submission

Thinking of Solutions

Slide 4

Student
Submission

Thinking of Problems

Slide 5

An Architectural Pattern

Slide 6

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"

– Alexander, et al., A Pattern Language. Oxford University Press, 1977

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.
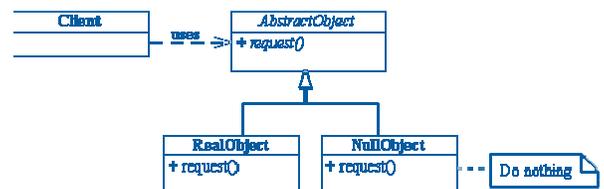+ **Motivation:** Remember the animals…

Strategy: Structure
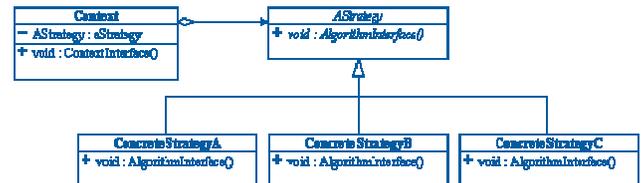
Null Object

+ **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.

Null Object: Structure

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.