Lecture 09:
Software Architecture (Part I)

> "Good software architecture makes the rest of the project easy."
> -- Steve McConnell

Outline

- Standard notations for expressing architectural designs
  - Dataflow / state diagram
  - Class diagram (upcoming)
  - Sequence diagram (upcoming)

Resources

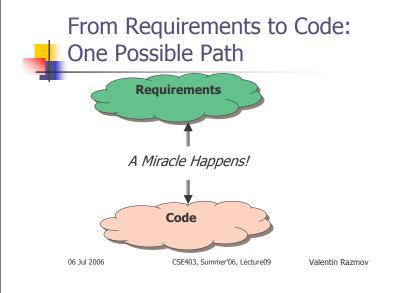- "Code Complete", 2nd ed., by Steve McConnell
  - Ch. 5: http://www.cc2e.com/docs/Chapter5-Design.pdf
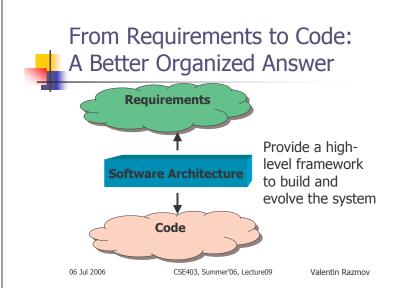- "Design Patterns Explained – A New Perspective on Object-Oriented Design", by Alan Shalloway and James Trott

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The Basic Problem: Getting from Requirements to Code

Requirements

? ? ?

Code

How do you bridge the gap between requirements and code?

From Requirements to Code: One Possible Path

Requirements

A Miracle Happens!

Code

From Requirements to Code: A Better Organized Answer

Requirements

Software Architecture

Code

Provide a high-level framework to build and evolve the system

An Architecture Helps with …

n System understanding — level of abstraction, vocabulary, constraints

n Reuse — of components, identifies commonalities

n Construction — partial blueprint

n Evolution — organization for change, separates "what" from "how"

n Analysis — of components and connections
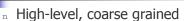
n Management — good milestone

n Communication — between stakeholders

Notations:
Dataflow / State Diagram

n High-level, coarse grained

n Used to describe interactions between the components of a system

n Example: