Software Design Patterns

Lecture 0

Introduction to the Course

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18 September 2025

Introduction to Design Patterns

- **Design Pattern: Typical**, **general** and **reusable** solution to **commonly occurring problems** in software design, like pre-made blueprints
- Creational patterns, structural patterns, and behavioral patterns
- The concept of patterns firstly described in **"A Pattern Language: Towns, Buildings, Construction"** authored by Christopher Alexander, Sara Ishikawa and Murray Silverstein, 1977
- **"Design Patterns: Elements of Reusable Object-Oriented Software"** authored by Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides (Gang of Four, **GoF**), 1994

Contents

- **Part A: Preparation**
  - Object-oriented programming, UML class diagram
- **Part B: Software Design Principles**
  - General design principles, SOLID principles
- **Part C: Classic Design Patterns**
  - Creational patterns, structural patterns, behavioral patterns
- **Part D: Advanced Topics**
  - More design patterns, combination of design patterns, refactoring

Assessment Components

a) Attendance and participation (10%)

b) Written examination (30%)

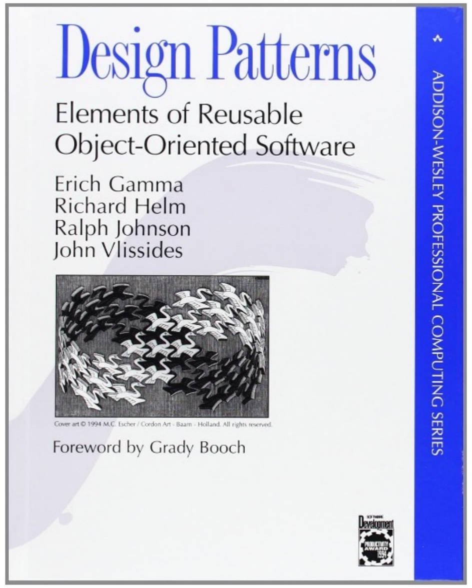
c) Final project (60%)

- Team-based: at most 5 members in each team
- A project that deeply involves the application of design patterns
- Source code, documents, and presentation

Recommended Learning Materials

- **Refactoring.Guru**
  https://refactoring.guru
- **Dive Into Design Patterns** by Alexander Shvets
- **Design Patterns: Elements of Reusable Object-Oriented Software** by Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides (GoF)
- **Head First Design Patterns, 2nd Edition** by Eric Freeman and Elisabeth Robson

Dive Into
DESIGN PATTERNS
Alexander Shvets


Design Patterns
Elements of Reusable Object-Oriented Software
Erich Gamma
Richard Helm
Ralph Johnson
John Vlissides
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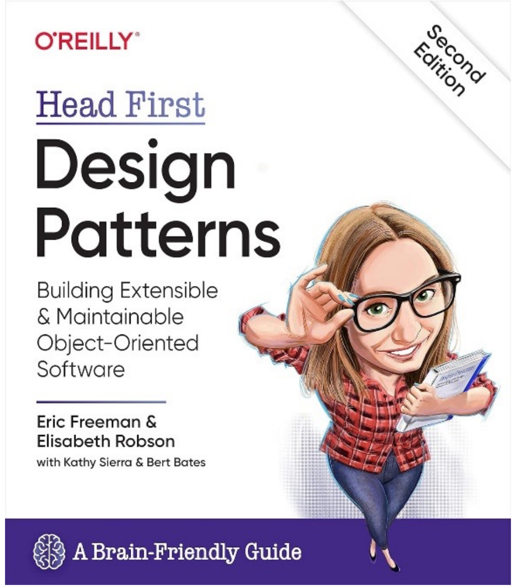
Foreword by Grady Booch
ADDISON-WESLEY PROFESSIONAL COMPUTING SERIES


O'REILLY
Second Edition
Head First
Design Patterns
Building Extensible & Maintainable Object-Oriented Software
Eric Freeman & Elisabeth Robson
with Kathy Sierra & Bert Bates
A Brain-Friendly Guide