CSE 403: Software Engineering, Fall 2016

courses.cs.washington.edu/courses/cse403/16au/

Conclusion

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Outline

- Final release and demo
- A brief recap of CSE 403
- Beyond CSE 403

final release and demo

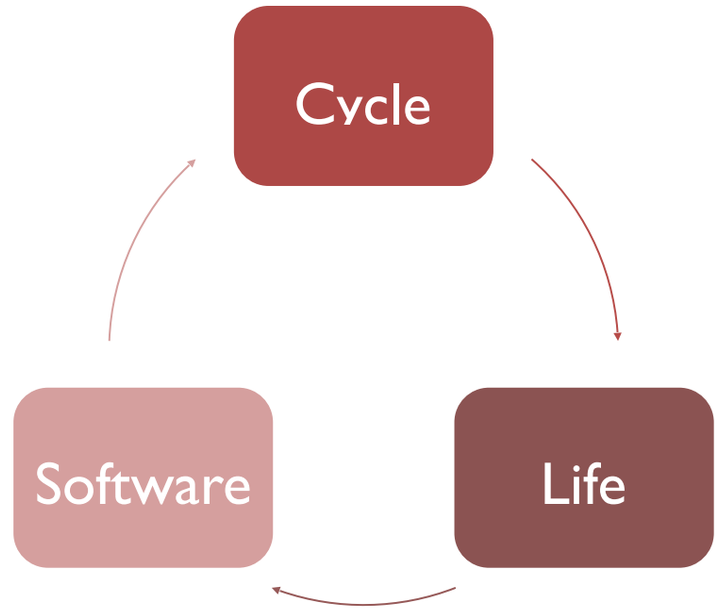
Logistics and dates for the final release & demos

- Final release on **Tuesday, Dec 06**, at 11pm
    - Final version of your product!
    - SRS revision
    - Requirements & schedule postmortem
- Final product demos on **Wednesday, Dec 07, and Friday, Dec 09, in class**
    - Must include all team members who have not presented yet
- Individual reflections on **Friday, Dec 09, at 11pm**

a brief recap of CSE 403

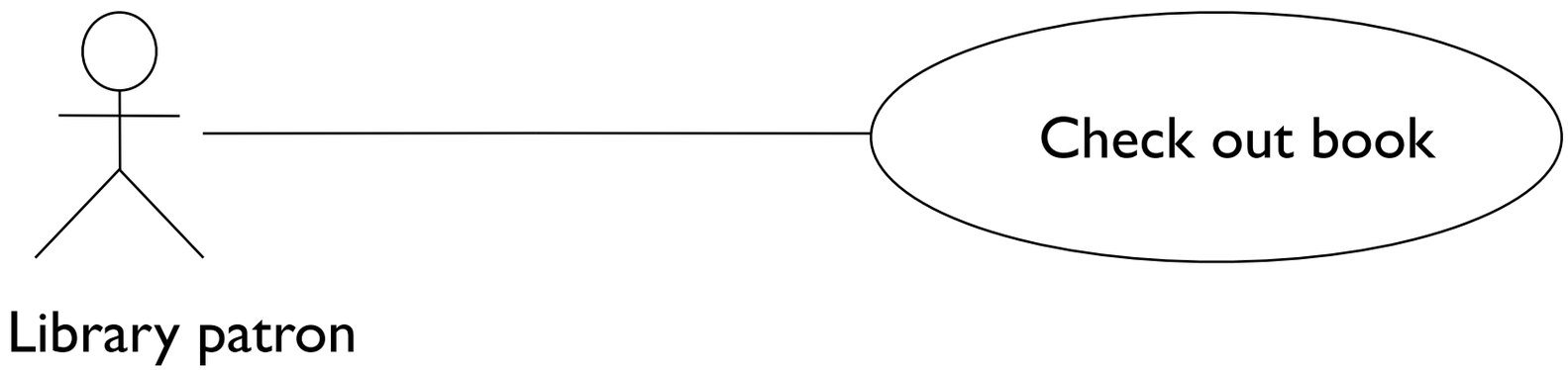
Software lifecycle

- Determines the order for Requirements, Design, Implementation, Testing, and Maintenance.
- Goal: Perform work as early as practical
    - Costly to discover bugs or make changes late
    - Costly to make decisions too early
    - Costly to do tasks multiple times
- In CSE 403, we followed an iterative process



Requirements

- "What" not "how."
- Reflects user rather than developer view of the system.
- A common technique for expressing requirements: use cases.
- Get feedback early (example: paper prototype).

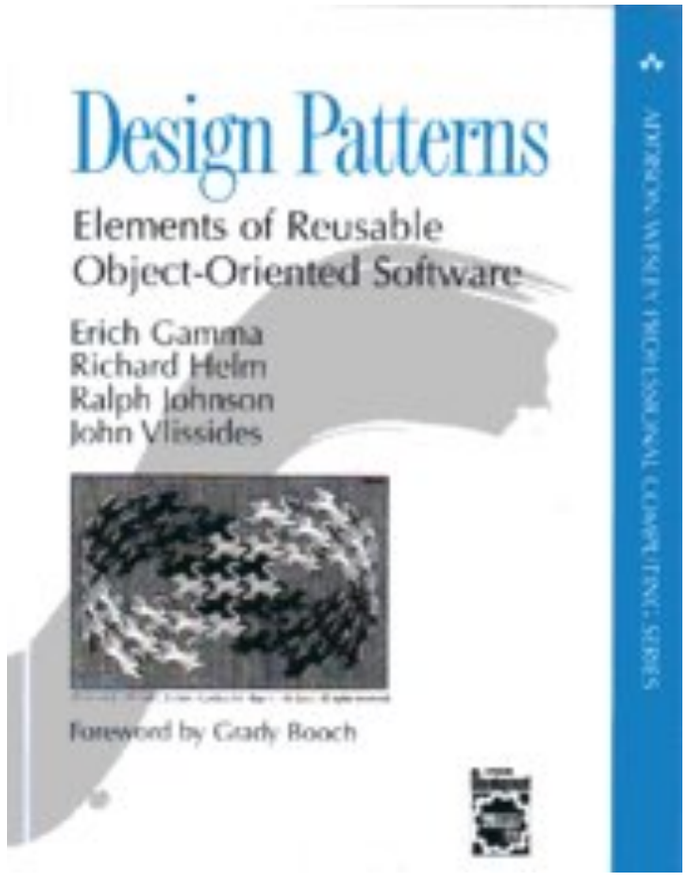


Architecture

- Provides a high-level framework to build and evolve a software system.
- Modules for logical units of computation
    - Minimize coupling, maximize cohesion.
- Draw it as a UML class or sequence diagram
    - Key purpose: to communicate to others
- Interactions are part of the architecture

Design patterns

- Vocabulary of program development:
    - A known solution to a known problem.
    - Don’t reinvent the wheel!
- Many kinds of design patterns:
    - Creational
    - Structural
    - Behavioral
    - Concurrency
    - …



Focus on modularity, abstraction, and specs

- No one person can understand all of a realistic system.
- Modularity permits focusing on just one part.
- Abstraction enables ignoring detail.
- Specifications and documentation formally describe behavior.
- Modularity, abstraction, and specifications help to understand/fix errors
    - Or to avoid them in the first place!

Process

- Needed to keep your project under control:
  - Specification
  - Schedule
  - Source control
  - Automated builds and test
  - Bug database
  - Bug fixes before features
  - Hallway usability testing

Testing, static analysis, and symbolic execution

- Increase software quality.
- Testing techniques
    - Unit and system testing
    - Black and white box testing
    - Integration and performance testing
- Static analysis
    - Soundness vs Completeness
    - Abstract values
    - Transfer functions
- Symbolic execution
    - Symbolic values
    - Path conditions
    - Tools

Code reviews and refactoring

- Code reviews improve code quality, teamwork, knowledge, and skills.
- Code reviews can also help identify opportunities for refactoring.
- Refactoring improves software's design
    - to make it more extensible, flexible, understandable, performant, …
    - but every improvement has costs (and risks)

beyond CSE 403

future

What you have learned and will learn

- Compare your skills today to the beginning of the term
    - Bottom line: Your project would be **easy** for you
- Your next project can be much more ambitious
- You will continue to learn
    - Building interesting systems is never easy, like anything worth doing.
    - Practice is a good teacher
        - Requires thoughtful introspection
        - Don’t learn **only** by trial and error!

Tell us what you think!

- Please complete the course evaluation form
  - Useful to future students
  - Useful to course staff
  - Useful to the department

Build amazing things!

- Building systems is fun!
    - It's even more fun when you build them successfully.
- Pay attention to what matters
    - Use techniques and tools of CSE 403 effectively.
    - Above all, use good taste and engineering judgement.