“There are two ways of constructing a software design: one way is to make it so simple that there are obviously no deficiencies; the other is to make it so complicated that there are no obvious deficiencies.”

-- C.A.R. Hoare (1985)
Readings

• “Code Complete (2nd ed.)”, chapter 5, by Steve McConnell (handout and on class web, Resources link)

References:
• “On the Criteria to be Used in Decomposing Systems into Modules”, by David Parnas (a classic)

• “Design Patterns Explained – A New Perspective on Object-Oriented Design”, by Alan Shalloway and James Trott

• Net Objectives “Emergent Design” presentation, by Scott Bain
Outline

- Where does design fit?
- What are desirable characteristics of a design?
- How do we attack the design process?
Where does design fit?

- Requirements
- Architecture – high level design
- Low level design
- Code
Architecture is design!

- Architecture, high level design, focuses on system components and their connections.

- Low level design is a step closer to code. It looks at objects, classes, algorithms, variables, ...

- The boundary between high and low level design is blurry. Many of the same principles apply!
Good design quotes

The driving force behind design is managing complexity

The goal of all software design techniques is to break a complicated problem into simple pieces

The key to performance is elegance, not battalions of special cases.

Bentley, McIlroy
What do we want in a design?

Top 7 desirable characteristics:

1. Minimal complexity
2. Loose coupling
3. Strong cohesion
4. Extensibility
5. Reusability
6. Maintainability
7. Leanness

Breakout session!

Identify how your system low level design addresses 3 of these characteristics. *Be specific!*

Prepare to share your answer with the class.