Today

- Quiz 3
- Process models Ccont.)

Homework

- Proj 2.2 due Tues.
- Proj 3 due Tues.
- HW 1 due Thurs. (extended)

Reading

- Evolutionary System Development handout
The Spiral Model

Start

Determine Objectives, Alternatives, and Constraints

Identify and Resolve Risks

Commit to Approach for Next Iteration

Evaluate Alternatives

Plan Next Iteration

Develop Iteration Deliverables, Verify Correctness

Release

Notes:

- Breaks project into smaller mini-projects
- Each mini-project addresses one or more “risks”
- Risks are interpreted broadly
  - poorly understood requirements
  - poorly understood architecture
  - performance problems
  - important missing features
Spiral Model Advantages and Disadvantages

Waterfall is like a “cruise”

Spiral is like a “road trip”

Q: What are the advantages?

• high-risk, not well understood projects
• ultimate “flexibility”
  – the model of all models
  – number of iterations, tasks in each iteration
• as costs increase, risks decrease
  – early iterations are often the cheapest
  – emphasis on risks
• management control as in waterfall
  – checkpoints and planning after each iteration

Q: What are the disadvantages?

• ultimate “flexibility”
• it is complicated
  – need dedicated, focused, informed management
  – have to define what to do before each iteration
  – have to know when you are done

Hopefully projects are not so high-risk and are fairly well understood
Staged Delivery (Incremental Development)

Requirements Analysis

Architectural Design

Stage 1: Detailed design, code, debug, test, and deliver

Stage 2: Detailed design, code, debug, test, and deliver

Stage n: Detailed design, code, debug, test, and deliver

Waterfall steps

Deliver product in increments

Notes:

• “traditional” requirements and architecture design phases

• show (deliver) software to customer in successively refined stages
  – partition system into subsystems in the beginning
  – add/refine subsystem and deliver result
  – performed one subsystem at a time
  – each increment (stage) is a traditional waterfall approach

• known what needs to be built before each increment (stage) starts
Incremental Development Advantages and Disadvantages

Q: What are the advantages?

- feedback on product earlier (instead of at end)
- if important subsystems developed early, users can use right away
- tangible signs of progress (after each increment)

Q: What are the disadvantages?

- requires careful planning (which stages, details of stage)
- can be hard to build subsystems independently
- increments should be meaningful to customer (which can be hard)