Goals

- Review material from Chapter 9 of Pilone & Miles
  - Ending an Iteration
    - System Testing
    - Bug Reports
    - Iteration Review
Ending an Iteration

- Following the agile practices we’ve covered each iteration will have
  - customer-driven functionality (user stories; feedback)
  - compiling code & monitored builds (continuous integration)
  - solid test coverage and continuously tested code (TDD)
  - reliable progress tracking (burn-down chart)
  - pacing that adapts to the team (iteration plan; velocity)
- and with this you may find yourself with spare time at the end of an iteration
What else can be done?

At the end of an iteration, you can reflect on things you’d like to add to daily work practice to provide additional benefits

Such as

- process improvements (what’s not working?)
- system testing (we’ve got unit tests and integration tests)
- refactoring of code based on lessons learned
- code cleanup and documentation updates
- design patterns
- environment updates, R&D, personal development time
Data in Burn Down

- One way to reflect on the iteration is to look at the burn-down chart
  - It can provide insight into the effectiveness of the team
- Were we ahead, were we always behind?
  - Are we good at adapting to change?
Unplanned Tasks

This burn-down chart shows the team getting burned with unplanned tasks and/or user stories.

The drop to zero at the end is NOT the result of some heroic effort on the part of the team; likely it is simply a result of scoping down.
This burn-down chart shows the team had bad estimates; everything took longer than planned.

Not getting to zero means the team needs to learn how to re-scope: delaying tasks and stories to subsequent iterations.
Integrating System Tests

- Our techniques do not provide time for system testing
  - A system test exercises the functionality of the system from “front to back” (UI to persistence layer) in real-world black-box scenarios
- Developers are too biased to do system testing, they know the code too well and do not necessarily have access to realistic test data
- Your end users should be the ones performing system tests on real data
  - If that’s not possible, you need a testing team!
Off by One

- In each iteration, the developers are concerned with the current set of user stories
  - They test constantly but those are unit/integration tests
- A test team, then, can perform system testing on system \( n-1 \) during iteration \( n \)
  - During iteration 1, the test team gets ready for iteration 2
    - Reviewing stories, writing tests, installing tools, etc.
- This leads to more being done in each iteration
  - and the book views them as separate iteration cycles
    - that is, more iterations
More iterations, more problems

- Running two iteration cycles means
  - LOTS more coordination which requires LOTS more communication
    - Will require “cross pollination” of standup meetings
  - Forces testing into a “box”: fixed time step
    - May not be able to cover all functionality within a single iteration
  - Bug fixing mixes in with new work
    - If the testing team is finding bugs, guess who has to fix them?
  - Tests are written against a moving target
More problems, more talk

- In order to deal with these problems, you just need
  - MORE communication to enable better coordination
    - and remember, in agile approaches, we value direct communication
  - We do have to worry about this on one level (Mythical Man Month) but remember that agile approaches avoid a lot of the documentation that slow traditional SE approaches down
Effective System Testing

- Good, frequent communication (devs., test team, customer)
- Known starting and ending state of system
- Document your test suites
- Establish clear success criteria (when can we go live?)
- Automate your tests
- Devs and test team work together (avoid fights!)
- Test team understands big picture view of system
- Accurate system documentation
Test results?

- We eventually want to see all tests pass
  - but before we do, the results of testing are bug reports
- Bug life cycle
  - Tester finds bug
  - Creates a bug report and submits it to issue tracking system
  - Developers create a story or task to fix the bug
    - Enters iteration plan and handled as normal
  - Developers fix the bug
  - Tester checks the fix and verifies the bug is gone
  - Tester updates the bug report (sets status to closed/resolved)
Bug Trackers

- Plenty of systems out there to do bug tracking
  - FogBugz, Bugzilla, Mantis, TestTrackPro, ClearQuest
- Important because they
  - let you prioritize bug reports
    - related to success criteria “go live when only priority 4 bugs remain”
  - let you keep track of everything related to a bug fix
  - let you generate important metrics related to life cycle quality
    - bug submission rate? location of bugs? bugs outstanding?
Bug Reports

- Good bug reports contain
  - A summary that describes the bug in 1-2 sentences
  - The steps needed to reproduce the bug (see it in action)
  - Expected Output vs. Actual Output
  - Configuration Information: Platform, version, etc.
  - Severity: how bad is the impact of this bug?
  - Priority: how quickly do we need to fix this bug?
  - Current Status
Iteration Review

- At the end of an iteration, take time to reflect and identify how the process can change to make things run smoothly.

- A good iteration review requires that you:
  - prepare ahead of time: bring a list of things to discuss
  - be forward-looking: what should we do to improve the next iteration?
  - calculate your metrics: velocity, burn-down rate, etc.
  - review a standard set of questions that helps the team look for opportunities to improve.
Review Questions

- Was the quality of our work acceptable?
- Was the pace acceptable?
- Are you comfortable with your current work assignments?
- Are our tools getting in the way? Are there new tools to consider?
- Was our process effective? Does something need to change?
- Performance problems? Bugs to discuss?
- Testing effective? “Bad smells” to get rid of
If you have extra time

- If you have “free” days at the end of an iteration
  - Fix bugs and/or refactor and/or update documentation
  - Tackle a user story from the next iteration
  - Prototype solutions needed in the next iteration
  - Training or Learning Time: Google’s “20% time” practice
Wrapping Up

- The end of an iteration is a time for reflection
  - What should we change to make the next iteration better?
- It is also a time for catching up or getting ahead
- Learn to use iterations well
  - Pay attention to burn-down rates and what they tell you about the team
  - Pace the iteration; if you have too much to do, scope the iteration down
- Review each iteration to continuously improve your process
Lecture 25: The Next Iteration
- Read Chapter 10 of Head First Software Development

Lecture 26: Alternate approaches to Concurrency
- No reading assignment
  - MapReduce
  - Agent model of Concurrency
    - Examples from Erlang and Scala