Reviews, etc.

- Reviews, walkthroughs, and inspections are all in a family of activities where an artifact (specification, code, etc.) is studied by a peer group to improve the artifact’s quality.
- There is a large and increasing literature that demonstrates the effectiveness (although not always the cost-effectiveness) of these approaches.

Reviews, etc.

- N-heads are better than one
- Intended to
  - identify defects
  - identify needed improvements
  - encourage uniformity and conformance to standards
  - enforce subjective rules

Walkthrough

- A formal activity
- A programmer (designer) presents a program (design)
- Values of sample data are traced
- Peers evaluate technical aspects of the design

Inspections [Sommerville]

- Formal approach to code review
- Intended explicitly for defect detection (not correction)
- Defects include logical errors, anomalies in the code (such as uninitialized variables), non-compliance with standards, etc.
Inspection requirements

- A precise specification must be available
- Peers must be knowledgeable about organizational standards
- Code should be syntactically correct and basic tests passed
- Error checklist must be provided

Inspection process

- Plan
- Overview
- Individual preparation
  - Code, documentation distributed in advance
- Meeting
- Rework
- Follow-up

Inspection teams

- Four or more members
- Author of code
- Reader of code (reads to team)
- Inspector of code
- Moderator chairs meeting, takes notes, etc.

Inspection checklists

- Checklist of common errors drives inspection
- Checklist dependent on programming language
  - Weaker type systems usually imply longer checklists
- Examples
  - Initialization, loop termination, array bounds, ...

Inspection rate

- 500 statements/hour during overview
- 125 statements/hour during individual prep
- 90-125 statements/hour during review
- Inspecting 500 statements can take 40 person-hours
  - For 1MLOC, this would be about 40 person-years of effort

Issues in inspections

- Can groupware technology significantly improve inspections?
- Can you have inspections without meetings?
  - Since meetings are expensive to hold and schedule
  - Since the preparation may catch more defects than the meetings
Software quality assurance

- What are we assuring?
- Why are we assuring it?
- How do we assure it?
- How do we know we have assured it?

What are we assuring?

- Validation: building right system?
- Verification: building system right?
- Presence of good properties?
- Absence of bad properties?
- Identifying errors?
- Confidence in the absence of errors?

Why are we assuring it?

- Business reasons
- Ethical reasons
- Professional reasons
- Personal satisfaction
- Legal reasons
- Social reasons
- Economic reasons
- ...

How do we assure it?

Midterm: the course web sez

- Both examinations will consist entirely of questions that will require you to bring together information from the lectures, from the readings (not including optional ones), and (to a much lesser degree) from your projects. ...
- They are open-book and open-note, but closed-any-other-sentient-being; all material not produced directly by you must be appropriately cited.
- To allow you to type the answers (which allows me to read the answers more easily), these exams will be handed out at 2:30PM in the classroom on the two examination days. See email to sign up for your two hour slot via a Catalyst "quiz". You may work on the exams anywhere you wish.
- They are due electronically (details to be announced), four hours later at 6:30PM on the same day; two hours after your starting time into the dropbox (which marks the time submitted).
- I will need significant notice in advance if either of these four hour periods are infeasible for you. [too late for significant advance notice]
Expectations

• One hour of work in two hours of time
• Read the required readings
• Review the lecture materials
• Expect questions such as
  – "No Silver Bullet" preceded the development of agile methods by over a decade. What do you think Brooks' reaction to the Agile Manifesto would be, based on specific content in his paper?
  – Briefly discuss how Michael Jackson might react to a proof of correctness, using Hoare triples, of a priority queue assignment in CSE326.
• Answers that are short-and-sweet are much preferred to long-and-rambling responses for which you hope to get partial credit because you said something that is true even if it doesn't relate to the question.