Topics for this Lecture

- Code reviews / software inspections

What is a Code Review or software Inspection?

- Having other people read the code

- Why do that?
  - Because, in many studies, it is the single most effective way to find and fix bugs
  - Human beings are **pretty smart**

  - Open source theory "**many eyes make for shallow bugs**"

What Kind of Review?

- There are a many of kinds of peer reviews.

  - **Ad hoc**, where I say “Hey, look at this code. I dont get what's going on here”
  - **Peer desk-check**, where you pass around where you send people your code and ask for their comments.
  - **Pair programming** is when you work close with someone else and you are always looking at each other’s code.

  - **Walk through**, **Team Review**, or **Formal Inspection** are very well designed process, paperwork, roles assigned to people that differ and have certain rules about who can take them on.

Formal Reviews

- A ***formal review*** can range from a simple meeting between two programmers to a detailed, rigorous of the software's design or its code.
- There are fours essential elements to a formal review:
  - **Identify Problems**. The goal of the review is to find problems with the software – not just items that are wrong, but missing items as well. All criticism should be directed at the design or code, not the person who created
  - **Follow Rules**. A fixed set of rules should be followed. For example, the amount of code to be reviewed, how much time will be spent, and so on.
  - **Prepare**. Each participant is expected to prepare for and contribute.
  - **Write a Report**. The review group must produce a written report summarizing the results of the review and make that report available to the rest of the product development team.

Peer Reviews

- The easiest way to get team members together and doing their first formal review of the software is through ***peer review***.
- ***Peer reviews*** are often held with just the programmers who designed the architecture or wrote the code and one or two other programmers or testers acting as reviewers.
- To assure the review is highly effective all the participants make sure that the **four key elements of a formal review** are in place (look for problems, follow rules, prepare for the review, and write a report).
- Peer reviews are informal, these elements scaled back.

Walkthroughs

- In a ***walk through***, the programmer who wrote the code formally presents it to a small group of five or so other programmers and testers.
- The reviewers should receive copies of the software in advance of the review so they can examine it an write comments and questions that they want to ask the at the review.
- The presenters reads through the code line by line, function by function, explaining what the code dies and why.
- It is very important that after the review the presents writ a report telling what was found and any plans to address any bugs discovered.

Inspections

- ***Inspections*** are the most formal type of reviews.
  - They are highly structured and require training for each participant.
  - The **presenter or reader** is not the original programmer.
  - The other participants are called **inspectors**. Each is tasked with reviewing the code from different prospective, such as a *user*, a *tester*, or a *product support person*.

- ***Inspections*** have proven to be very effective in finding bugs in any software deliverable, especially *design documents* and *code*.

Participants of an Inspection

- **Moderator** – Coordinates the inspection and leads the discussion
- **Producer** – Responsible for the work being inspected
- **Reader** – Paraphrases the work inspected
- **Inspector** – Inspects the product
- **Recorder** – Records problems discussed
- **Manager** – Supervises the producer

Benefits of Inspections

- Finding bugs early. The cost of fixing a defect rises dramatically the later it is found in the development lifecycle of the program.

- Inspections shorten delivery time by reducing the time spent in the integration and system test/debug phases, since a cleaner product is passed into those late-stage quality filters.

- All participants can learn something from every inspection. Group inspections provide an opportunity to see how other team members do things.

References:

Software Testing (2nd Edition) 2nd Edition by Ron Patton (Author) Ch.6
http://classes.engr.oregonstate.edu/eecs/summer2015/cs362-002/Lecture15.pdf