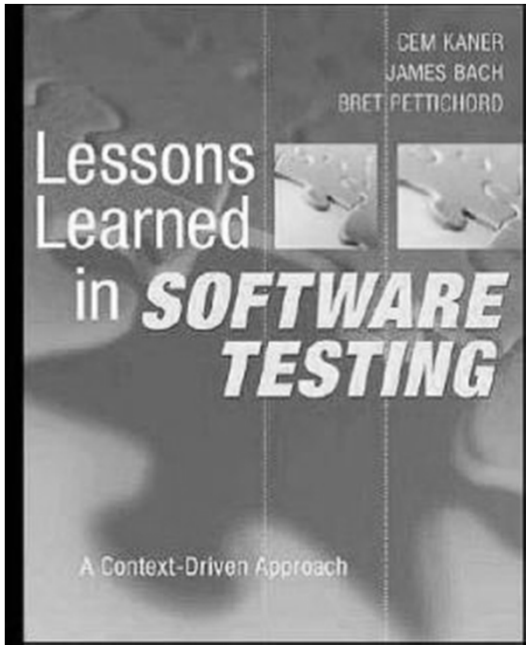
Lessons Learned in Software Testing

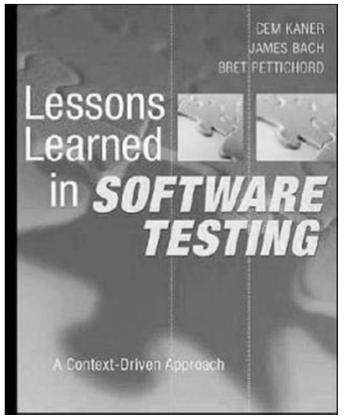


- An excellent book covering a range of testing topics
- Practical rather than academic
- In the next few lectures, we'll discuss some of the key "lessons" from this book, and how they apply to all testing efforts
  - Focus on the practicalities of testing, not the technical details: testing is more about a state of mind than a particular "kind of programming"

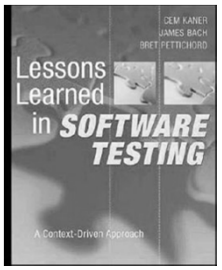
Testing: What, Not How

- The technical side of testing usually depends on what you are testing
  - To test a file system, you need to understand file systems
  - To test Java code, you probably want to know Java well
  - Test programs aren't "special" programs
    - Often just use a standard scripting language or the language of the program you are testing
- The big difference is the *goal*
  - In typical programming, you want to produce a program that, given input X produces output Y
  - In testing, there is no such simple goal
  - Many radically different solutions
    - You have to THINK *more* than in most coding

How to Test Software

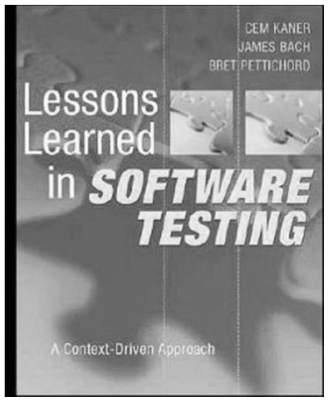


- Five major themes
  - **The testing role**
    - What does a tester *really* do?
  - **Thinking like a tester**
    - Are there differences between thinking like a programmer/developer and thinking like a tester?
  - **Testing techniques**
  - **Reporting bugs and working with others**
    - If a tree falls in the forest and no one hears it, can the bug possibly be fixed?
  - **Planning and strategy**



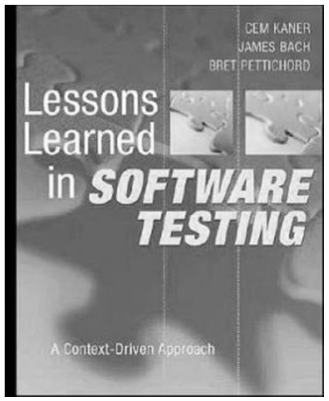
Theme 1:
The Testing Role

The Testing Role



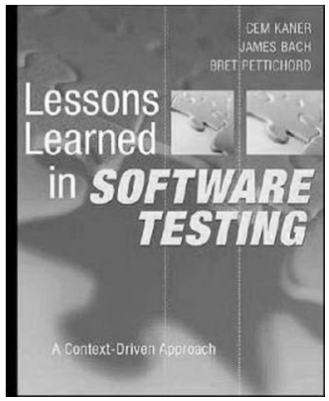
- Lesson 1: "You are the headlights of the project"
  - A software project is like driving off-road in rugged terrain, at night
  - The tester lights the way!
  - Testing is about *finding information*

The Testing Role



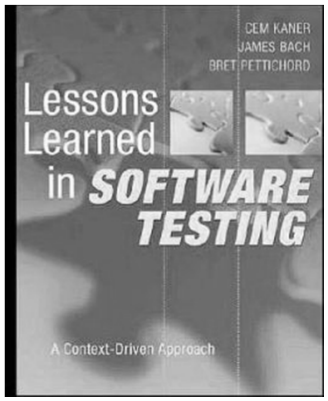
- Lesson 2: "Your mission drives everything you do"
  - Testing depends on the project
    - Goal could be "find every bug, at any cost"
    - Or "satisfy this FAA requirement"
    - Or "knock this into shape for beta release"
    - Or "keep costs minimal without making the initial version too embarrassing"
    - Or "find out if this program we're considering buying is worth paying for"
    - Or just "Satisfy the client"

The Testing Role



- Lesson 5: "Find important bugs fast"
  - In most cases, finding "killer" bugs is part of the tester's key mission
    - Test changed code before stable code
    - Test critical functions before rarely used things
    - Test for catastrophic problems before problems users can work around
    - **Test things someone will definitely care about before you test things you aren't sure anyone will care about at all**

The Testing Role

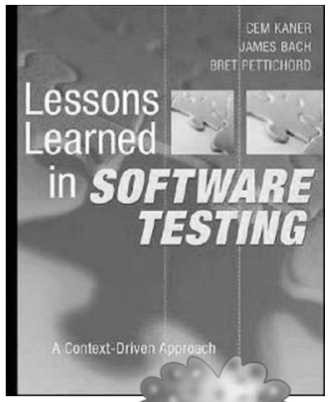


- Lesson 7: "Question everything, but not necessarily out loud"
  - Testing well requires *skepticism* and even a touch of *paranoia*
  - Being skeptical and paranoid all the time can put programmers and managers "on defense"
  - Be helpful, don't be a pest
  - Use things you keep to yourself to guide testing, though!

"Trust no one"

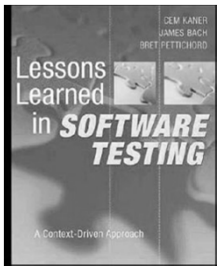
THE X-FILES

The Testing Role



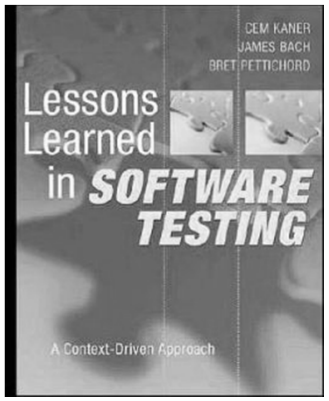
- Lesson 14: "Beware of becoming a process improvement group"
  - Tempting to say "I'm tired of finding bugs, let's make sure these clowns quit introducing so many bugs"
    - It would be nice if programmers worked more carefully, sure
    - But that's usually not your job
    - Even with management support, testing is seldom a good "home" for a development process criticism society

How testers see programmers



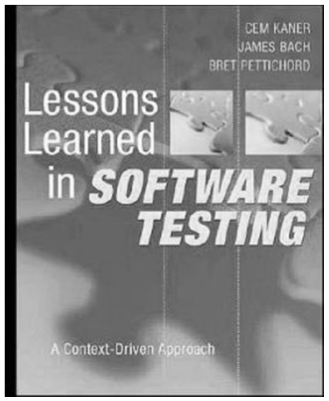
Theme 2: Thinking Like a Tester

Thinking Like a Tester

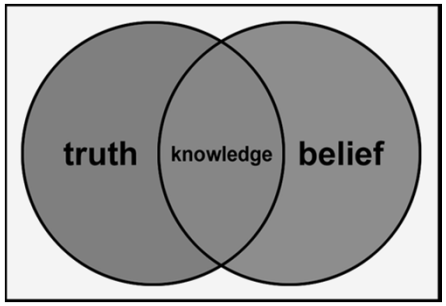


- Lesson 16: "Testing is applied epistemology"
  - What the heck is epistemology?
    - The branch of philosophy that covers *evidence and reasoning*
    - "*How* we know what we know"
  - The key questions of testing:
    - "*How* do you *know* the software is good enough?"
    - "*How* would you *know* if it wasn't good enough?"
    - "*How* do you *know* you've tested enough?"

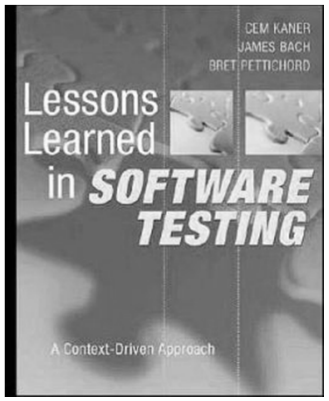
Thinking Like a Tester



- Lesson 17: "Studying epistemology helps you test better"
  - Key topics in epistemology:
    - Gathering/assessing evidence (tests!)
    - Making valid inferences (if this works, that probably also works)
    - Justification of beliefs:
      - How do you know Antarctica is there?
      - How do you know your brakes work?
    - Avoiding fallacies in informal reasoning
    - Using knowledge to make decisions



Thinking Like a Tester



- We'll continue with ways to "think like a tester" next time – in the meantime, it's worth considering this general question of the *mindset* of testing