

AUTOMATED TESTING PATTERNS AND PRACTICES

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BACKGROUND

- PRINCIPAL SOFTWARE ENGINEER @ THE NERDERY
- MCS, THE UNIVERSITY OF IOWA, SOFTWARE ENGINEERING TRACK
- “FULL STACK” - C#/NET, MVC, JAVASCRIPT, MSSQL
- TESTING PROPOSER – TDD PREFERRED
- TWITTER: @TVANFOSSON
- WEB: [HTTP://FARM-FRESH-CODE.BLOGSPOT.COM](http://FARM-FRESH-CODE.BLOGSPOT.COM)



AUDIENCE

- PRIMARILY BACKEND DEVELOPERS
 - NO UI TESTING
- SOME EXPERIENCE WITH AUTOMATED TESTS
- TEST DRIVEN DEVELOPMENT
- INTERACTION PREFERRED – LET'S LEARN TOGETHER

RATIONALE

- TEST MAINTENANCE
 - VELOCITY (KIND OF HATE THAT WORD)
 - ABANDONMENT
- DIFFICULTY
 - DIFFICULT TO TEST: RANDOMNESS
 - CROSS-CUTTING CONCERNS: ATTRIBUTES, AUTHENTICATION, MODEL BINDING
 - HIGH NUMBER OF DEPENDENCIES

ROADMAP

- APPROACH
- TEST MAINTENANCE/REFACTORING
 - TEST CONTEXT
 - MOCKING
 - TEST DATA
- HARD TO TEST SCENARIOS
 - ASPECTS/CROSS-CUTTING BEHAVIOR
 - UN-MOCKABLE CLASSES – DAPPER, HTTPCLIENT
 - EXCEPTIONS
 - DISTRIBUTIONS – RANDOMNESS

APPROACH

- TREAT YOUR TEST CODE AS A FIRST CLASS CITIZEN
 - CLEAN
 - DRY
- DON'T TEST THE FRAMEWORK
- ELIMINATE REDUNDANT TESTS
 - TEST BOUNDARIES, NOT RANGES
 - WHITE BOX, NOT BLACK BOX
- LOOK FOR SMELLS
 - MULTIPLE HAPPY PATHS?
 - TESTS FOR MANY EFFECTS?
- USE ALL THE TOOLS IN THE TOOLBOX

TEST CONTEXT

- PROVIDES CONTEXT TO SET UP AND VALIDATE YOUR TESTS
- ISOLATES TESTS FROM SETUP
- REFACTOR TO SHARE COMMON CODE
 - DEPENDENCY SET UP
 - DATA GENERATION
 - VALIDATION HELPERS



EXAMPLES

MOCKING

- WHEN TO MOCK
 - LIMIT MOCKS TO BOUNDARIES
 - ADD MOCKS TO AVOID COMPLICATED SET UP
 - SAY "WHAT," NOT "HOW"
- HOW TO MOCK
 - FRAMEWORKS – FAKEITEASY, MoQ
 - HAND MOCKS – AVOID THE RABBIT HOLE
 - DON'T – SELF-CONTAINED, FAST, WITHIN SUBSYSTEM
- SET UP
 - AVOID SPECIFYING ARGUMENTS WHEN USING TO GET DATA
 - BE SMART ABOUT VALIDATING ARGUMENTS WHEN VERIFYING

What's the difference between faking, mocking, and stubbing?

Faking: "No those pants don't make you look fat".
Mocking: "It's not the pants". Stubbing: "Ow! Who left this box of books in the bathroom in front of the door?"

- Steven A. Lowe

TEST DATA

- MECHANISMS
 - CONSTANTS
 - JSON
 - DATABASE SCRIPTS/SEEDING (INTEGRATION TESTS)
- CONCERNS
 - EFFICIENCY – CACHED
 - MAINTAINABILITY
 - REUSE – READ-ONLY OR DON'T CACHE

EXAMPLES

ASPECTS

- TYPES
 - ATTRIBUTES
 - HANDLERS
 - MODEL BINDERS
- TECHNIQUES
 - ISOLATED
 - IN-MEMORY SERVER



EXAMPLES

UN-MOCKABLE CLASSES

- DIFFICULT CLASSES
 - STATIC
 - EXTENSION METHODS – SPECIAL CASE OF STATIC, BE CAREFUL
 - SEALED
- APPROACHES
 - REFACTOR TO NON-STATIC
 - INTRODUCE WRAPPERS
 - QUASI-INTEGRATION TESTS (DAPPER)



EXAMPLES

DISTRIBUTIONS - RANDOMNESS

- AS A DEPENDENCY? MOCK!
- NON-DETERMINISTIC
- TEST QUALITIES, NOT SPECIFIC RESULTS



EXAMPLES

QUESTIONS?

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