CS3500: Object-Oriented Design
Fall 2013

Class 15
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Assignment 6 Updates
Code Quality

Good
- shorter
- easier to read
- elegant
- clean
- modular

Bad
- longer
- harder to read
- less elegant
- tangled
- less modular (different levels of abstraction mixed up in code)
Control Flow Diagram

- Pictorial description of the flow of program control
- Diamonds: decisions
- Rectangles: program statements
- Break apart compound conditionals
- While loops have one decision (the continuation test)
  - Unless the while loop has compound conditional tests – those should be broken up
Control Flow Templates

- **for** and **while** Loops
- **do-while** Loops
- **if** Statements
- **Nested if/else/if** Statements
- **Sequential if** Statements
Compound Predicates
Control Flow Templates

predicate1 && predicate2

predicate1 || predicate2
Cyclomatic Complexity (CC)  

[McC76]

- CC = Edges – Nodes + 2
- CC = Predicate Nodes + 1

Using null as a legitimate value
Using null as a legitimate value

Why usually a bad idea:

- You will end up with lots of check for null, since you won’t be making calls to methods for an instance of the class
- You will lose the idea of the class having multiple types.
- Makes programs harder to read
- May be harder to interpret.
- More difficult if add subclasses later
Code Review
Code Inspections
Software Reviews

Process where software artifacts are reviewed by developers, managers, and/or customers for comment or approval [IEEE 1990]

- Detect errors/inconsistencies
- Clear intention
- Design/software meets requirements
- Developed in uniform manner using standards
Review Benefits

• Learn about system and teammates programming techniques
• Reduce “truck-factor”
• More likely to produce high quality, clear work
Inspection Roles

• **Author**: Person who developed artifact
• **Inspectors**: Inspect artifact. Everyone except the author.
• **Moderator**: Member of the quality assurance team
• **Scribe**: Takes notes during inspection of issues of interest
• **Reader**: Person who interprets artifact for inspectors
Inspection (Fagan-style)

Inspection Preparation

Inspection Meeting

Individual Review

Defect Correction

Substantial Changes?

Yes

Correction Verification

No
Information Preparation

- Author prepares artifact and gives to moderator
- Moderator obtains inspection checklists
- Moderator distributes materials to inspectors
Individual Review

• Each inspector looks over artifact before inspection meeting
• Review from check list and own knowledge of the system and requirements
• Record faults found
• Record time invested (no more than 2 hours)
• Reader should prepare to explain their interpretation of the artifact

S. Heckman & J. D. Young, 2009-2010, based on L. Williams, 2007
Inspection Meeting

- Moderator calls meeting to order
- Reader interprets artifact in sections
- Inspectors note problems or ask questions
- Author answers questions
- Scribes record issues
Inspection Guidelines

• Do NOT correct defects, instead give a course of action
• Author answers questions and does NOT justify decisions
• No personal attacks on authors
• Focus on important issues, less on style issues
• Inspection is no longer than 2 hours in one session
Common Defects

• Infinite loops
• Missing or incorrect conditions
• Variable names
• Forgot a case
• Uninitialized variables
References


• Based on Laurie Williams slides and discussion found at: http://www.realsearchgroup.org/ShortLectures/Inspections/Inspections.html