Chapter 9–
Implementation

Software Engineering

Characteristics of Good Implementations

Good implementation:

- Readability
- Maintainability
- Performance
- Traceability
- Correctness
- Completeness

Coding Standards

Coding standards typically include conventions for:

- Naming
- Indentation
- Commenting style
- Error messages
- Banning certain language features

Naming Conventions

Naming conventions:

- Names of classes, methods, variables and other programming entities (directory and file naming conventions)
- Guideline – long names for global identifiers, short names for local
- Consistency – ID , Id
- Separating

    C: do_something, Java: doSomething

Comments

2 problems with comments:

1. May distract from the code and make program harder to read
2. May be wrong

Types of Comments

6 types of comments:

1. Repeat of the code (avoid)
2. Explanation of the code (maybe rewrite code)
3. Marker in the code (incomplete, opportunities for change, who changed – use version control instead)
4. Summarizing the code (maybe abstract to own function and name correctly)
5. Description of code intent (most useful)
6. External references (“Implements function xyz described ….)

Coding Standards

Proposed:
\repo_standards
endpoint_docs.md
general.md
go.md
js.md
php.md
…

Coding Standards

https://golang.org/doc/effective_go.html

https://github.com/jamescooke/restapidocs/tree/master/examples

Debugging

4 phases of debugging:

1. Stabilization/reproduction (output is minimal test case that causes error, don't need to look at code)
2. Localization (find in code)
3. Correction
4. Verification

Guideline for locating errors

Code that tends to have more errors:

1. Routines with >1 error
2. Newly created code

Defensive Programming

Assertions can be used for defensive programming

Most modern programming languages support assertions (page 199)

Refactoring Code

Refactoring – improving your code style without altering its behavior

Remove "bad smells" (Fowler, 1999)

- duplicated code
- Long methods
- Large classes
- Switch statements
- Feature envy
- Inappropriate intimacy