Software Engineering in Practice
Software quality

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Assignment (Software quality)

Answer the following for a popular open source project:

- How do they perform quality assurance on the system under development?
- Which factors and quality characteristics are most important for the software quality requirements?
- How do they measure software quality?

Definition

"The capability of software product to satisfy stated and implied needs under specified conditions."

"The degree to which a software product meets established requirements; however, quality depends upon the degree to which those established requirements accurately represent stakeholder needs, wants, and expectations"

Value and costs of quality

- Prevention
- Appraising
  - Reviews
  - Tests
- Internal failures
- External failures

Basic terminology

- Models
  - (ISO/IEC 25010: 2011)
    * Product quality
    * Quality in use

- Process quality
- Software quality improvement
- Software safety
  - Standards in safety-critical software
  - Reducing the the risk of failure
    * Avoidance
    * Detection
    * Removal
    * Damage limitation
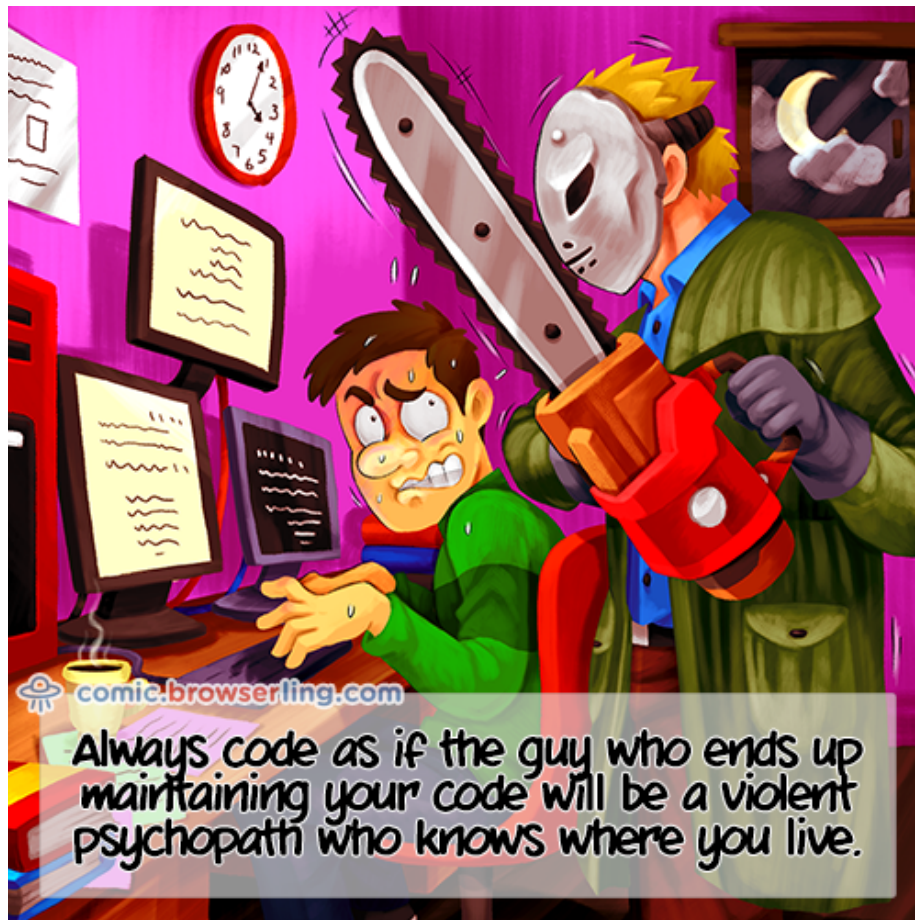

Figure 1: Always code as if the guy who ends up maintaining your code will be a violent psychopath who knows where you live.

https://comic.browserling.com/79

Product quality

- Functional suitability
- Reliability
- Operability
- Performance efficiency
- Security
- Compatibility
- Maintainability
- Transferability

Quality in use

- Effectiveness
- Efficiency (refers to the user experience)
- Satisfaction
- Safety
- Usability

Software quality management processes

- Software quality assurance
- Verification and validation
    - Am I building the software correctly?
    - Am i building the correct software?
- Reviews and audits
    - Management review
    - Technical review
    - Inspection
    - Walk-through
    - Process and product assurance audit

Problem characterization

- Computational error
- Human error
- Defect (includes hardware)
- Software fault / bug
- Failure

Quality measurements

- Fault density
- Failure intensity

Software quality management techniques

- Static
- Dynamic

Software quality tools

- Facilitate and automate reviews and inspections
- Safety hazard analysis
- Track software problems
- Automate testing
- Static and dynamic analysis
- Analyze data captures from software engineering environments

Reading material

- Maritime Software Quality Guidelines

Assignment (Software engineering operations and professional practice)

- For (probably two distinct) appropriate open source projects present the following.
  - How is the software supporting software engineering operations / SRE / production operations?
  - What issues of professional ethics arise from the project's development and use?
- Carefully select projects where you can provide interesting and insightful answers.