

# 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

### **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: professional practice)**

- Which issues of professional ethics arise during the development of open source software?
- What legal liability issues arise during the development of open source software?
- How important are social skills for a software engineer?

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