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SOFTWARE ENGINEERING PROCESS AND QUALITY MANAGEMENT

Lecture 1 – Introduction to Software Testing

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What is Software Quality?

Quality is conformance to requirements (Producer View)
- Philip Crosby

Quality is fit for use (Customer View)
- Joseph Juran & Edwards Deming

What is Software Testing?

- Software testing is the process of evaluating a software application to identify defects and ensure it meets quality standards.

Importance of Software Testing for Quality

- Helps detect defects early
- Ensures software meets business and user needs
- Improves reliability, security, and maintainability
- Reduces post-release failures and maintenance costs

What happens when software testing is not done properly?

- Windows 10 Update Deletes User Files (2018) – Read More

- Knight Capital Trading Glitch (2012) – $440 Million Loss in 45 Minutes –Read More

- NASA's Mars Climate Orbiter (1999) – $327 Million Lost – Read More

Quiz 1

How is Software Testing Done?

- Manual Testing: Performed without automation tools
- Automated Testing: Uses scripts and tools
- Static Testing: Reviews and inspections
- Dynamic Testing: Executing test cases

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Quiz 2

Basic Terminology in Software Testing

- Bug/Defect: A flaw causing incorrect results
- Test Case: Set of conditions for testing
- Test Plan: Strategy for testing
- Validation: Ensures software meets user needs
- Verification: Ensures software meets requirements

Types of Software Testing

- 1. Functional Testing:

- - Unit Testing

- - Integration Testing

- - System Testing

- - User Acceptance Testing (UAT)

Types of Software Testing

2. Non-Functional Testing:

- Performance Testing

- Security Testing

- Usability Testing

- Compatibility Testing

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Quiz 3

Software Testing Principles

- Testing shows presence of defects, not absence
- Exhaustive testing is impossible
- Early testing saves time & cost
- Defect clustering
- Pesticide paradox
- Testing is context-dependent
- Absence of errors is a fallacy

Software Testing Process

- Requirement Analysis

- Test Planning

- Test Case Development

- Test Execution

- Defect Reporting

- Test Closure

Common Challenges in Software Testing

- Changing requirements
- Time constraints
- Complexity in large software systems
- Defect leakage
- Need for skilled testers

Quiz 4

Conclusion

- Software testing is critical for ensuring quality, reliability, and security. Understanding principles, types, and processes helps teams build better software.

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Feedback