

Software Engineering

(CSE 355)

Lecture 10

(Software Testing)

Software Quality Assurance (SQA)

- ❑ Is an all **encompassing** activity
- ❑ Requires a **supportive culture**
- ❑ Starts from the requirement analysis and continue for the lifetime of the product
- ❑ Testing is a component of SQA.

Types of Testing

- Functional Testing
- Non-functional Testing
- Unit Testing
- Integration Testing
- System Testing
- Black Box Testing
- White/Glass Box Testing
- Alpha Testing
- Beta Testing
- Acceptance Testing
- Regression Testing

Types of Testing

- ❑ Functional and non-functional testing are from **functional point of view**
- ❑ Unit, Integration and System testing from **code perspective**.
- ❑ Black box and White box testing are from **knowledge perspective**
- ❑ Alpha, Beta, Acceptance testing are from **release perspective**
- ❑ Regression testing is for **change**.

Functional Testing

- ❑ Based on required functionality (**SRS**)
- ❑ Tests are created/documented based on the requirements
- ❑ Test scenarios are written and executed
- ❑ Comparison with actual and expected results
- ❑ Can be automated

Non-Functional Testing

- Load Testing
- Latency issues
- Bottleneck discovery
- Scalability
- Stress testing (abnormal situations)
- Usability testing (as opposed to interface testing)

Unit Testing

- ☐ Should be automated
- ☐ Testing on individual units of code. May need to generate mock objects.
- ☐ Test data used is not the same as those used by a dedicated testing team.
- ☐ Unit Testing is to test that the method works according to the specification, or also according to the specification for abnormal value i.e. checking for i/p of good and also for bad input.
- ☐ It is actually developer activity not the product quality activity
- ☐ Try to expose a hidden bias

Integration and System Testing

- Integration Testing
 - Bottom up
 - Top down
- System Testing

White Box and Black Box Testing

White/Glass Box Testing	Black Box Testing
Tester can see the code	Tester can't see the code
Ideal for algorithm testing	Not suitable for algorithm testing
Can introduce unintended bias	Sounds harder but can produce very useful test cases

Alpha and Beta Testing

❑ Alpha Testing

- Done by testers
- Usually when the product is deemed almost ready
- Usually at development site
- A pre-cursor of Beta

❑ Beta Testing

- Done by selected group of real users
- Done at client site
- The idea is to get real users' feedbacks

System and Regression Testing

❑ System Testing

- Sometimes called User Acceptance Testing (UAT)
- Tests whether the system is acceptable to users

❑ Regression Testing

- Test part of or the entire system after some change in code/environment/configuration etc.