

Chapter 9

■ Software Testing Strategies

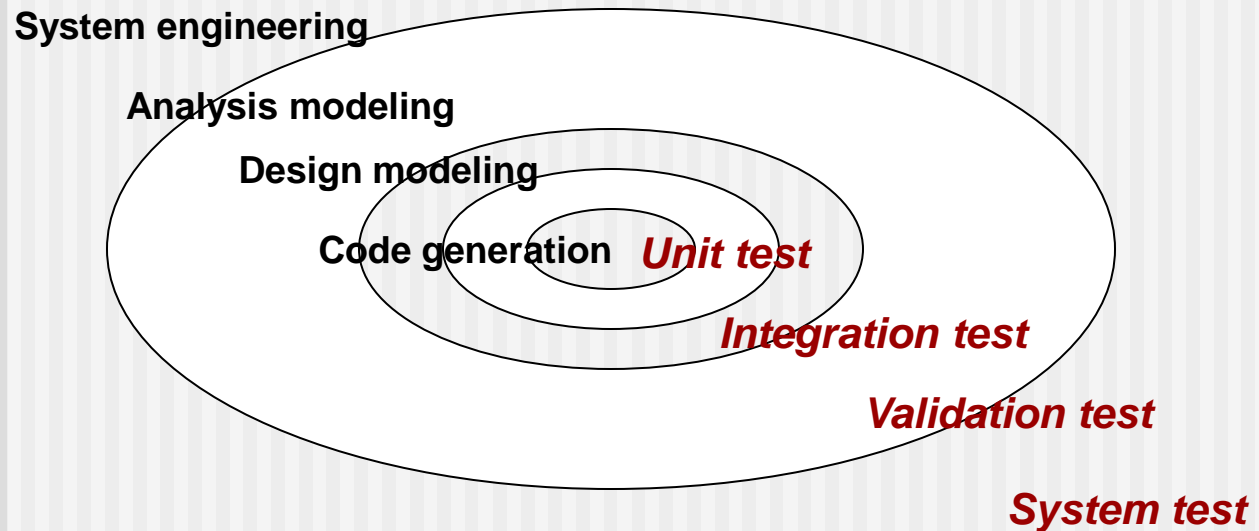
Software Testing

Testing is the process of exercising a program with the specific intent of finding errors prior to delivery to the end user.

Strategic Approach

- To perform effective testing, you should conduct effective technical reviews. By doing this, many errors will be eliminated before testing commences.
- Testing begins at the component level and works "outward" toward the integration of the entire computer-based system.
- Different testing techniques are appropriate for different software engineering approaches and at different points in time.
- Testing is conducted by the developer of the software and (for large projects) an independent test group.
- Testing and debugging are different activities, but debugging must be accommodated in any testing strategy.

Testing Strategy



High Order Testing

- **Validation testing**
 - Focus is on software requirements
- **System testing**
 - Focus is on system integration
- **Alpha/Beta testing**
 - Focus is on customer usage
- **Recovery testing**
 - forces the software to fail in a variety of ways and verifies that recovery is properly performed
- **Security testing**
 - verifies that protection mechanisms built into a system will, in fact, protect it from improper penetration
- **Stress testing**
 - executes a system in a manner that demands resources in abnormal quantity, frequency, or volume
- **Performance Testing**
 - test the run-time performance of software within the context of an integrated system

Debugging: A Diagnostic Process



Debugging Techniques

- **brute force / testing**
- **backtracking**
- **induction**
- **deduction**

Correcting the Error

- *Is the cause of the bug reproduced in another part of the program?* In many situations, a program defect is caused by an erroneous pattern of logic that may be reproduced elsewhere.
- *What "next bug" might be introduced by the fix I'm about to make?* Before the correction is made, the source code (or, better, the design) should be evaluated to assess coupling of logic and data structures.
- *What could we have done to prevent this bug in the first place?* This question is the first step toward establishing a statistical software quality assurance approach. If you correct the process as well as the product, the bug will be removed from the current program and may be eliminated from all future programs.

Questions

- 1、 What are the software testing strategies?
- 2、 What are the strategies of the integration testing?