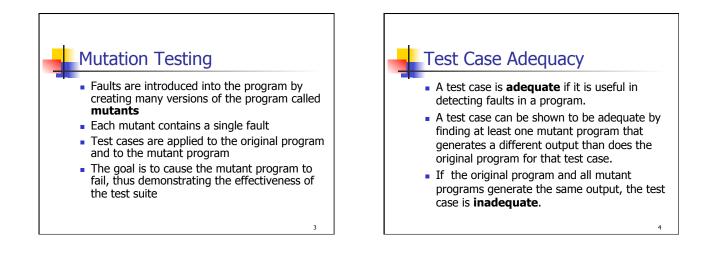
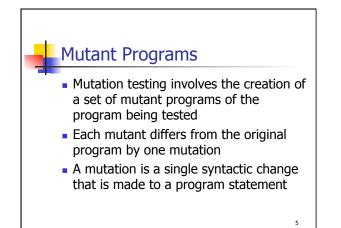
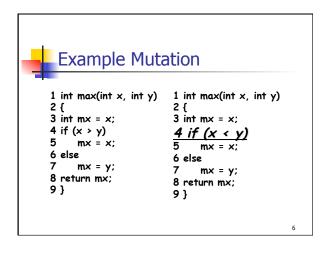


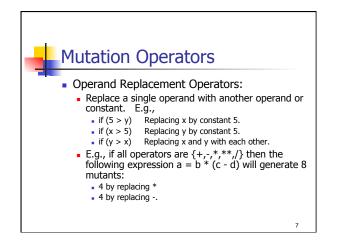


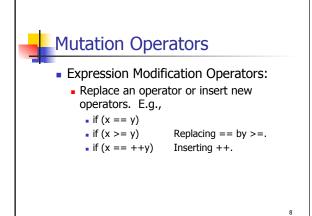
- Mutation Testing is a testing technique that focuses on measuring the adequacy of test cases
- Mutation Testing is NOT a testing strategy like Boundary Value or Data Flow Testing. It does not outline test data selection criteria
- Mutation Testing should be used in conjunction with traditional testing techniques, not instead of them

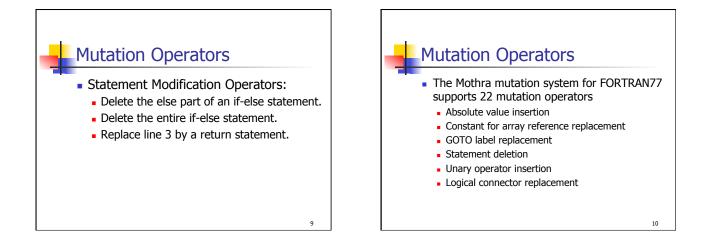












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Why Does Mutation Testing Work?

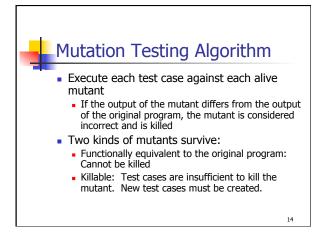
 The operators are limited to simple single syntactic changes on the basis of the competent programmer hypothesis

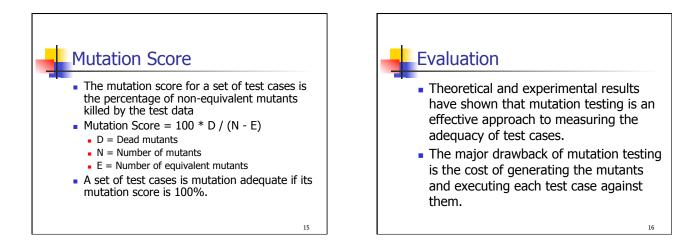
The Competent Programmer Hypothesis

- Programmers are generally very competent and do not create "random" programs.
- For a given problem, a programmer, if mistaken, will create a program that is very close to a correct program.
- An incorrect program can be created from a correct program by making some minor change to the correct program.

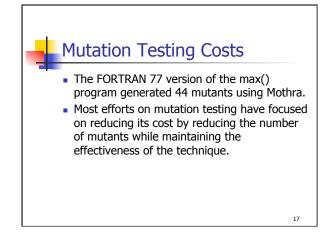


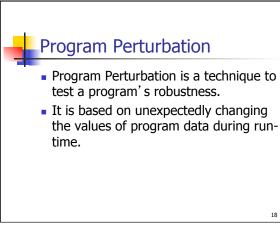
- Generate program test cases
- Run each test case against the original program
 - If the output is incorrect, the program must be modified and re-tested
 - If the output is correct go to the next step ...
- Construct mutants using a tool like Mothra

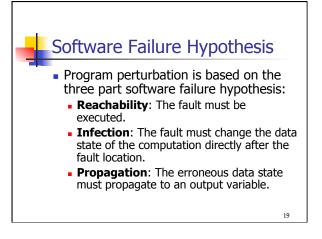


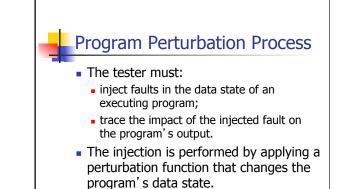


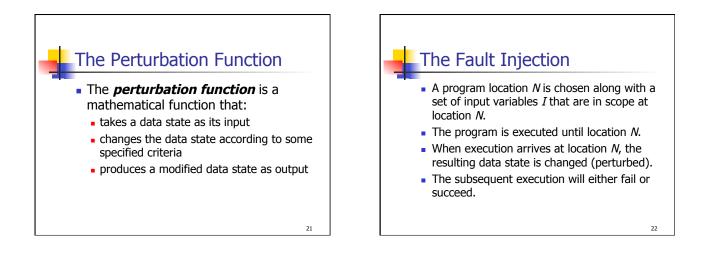
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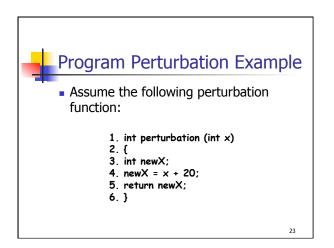


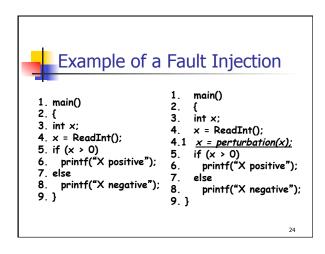












What Perturbation Testing is and is Not

- Perturbation testing is NOT a testing technique that outlines test selection and coverage criteria.
- Rather, perturbation testing is a technique that can be used to measure the reliability of the software (tolerance to faults).

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Evaluation

- The program is repeatedly executed and injected with faults during each execution.
- The ratio of the number of failures detected divided by the total number of executions is used to predict failure tolerance.