

# Regression Testing and Test Quality

Venkatesh-Prasad Ranganath  
Kansas State University

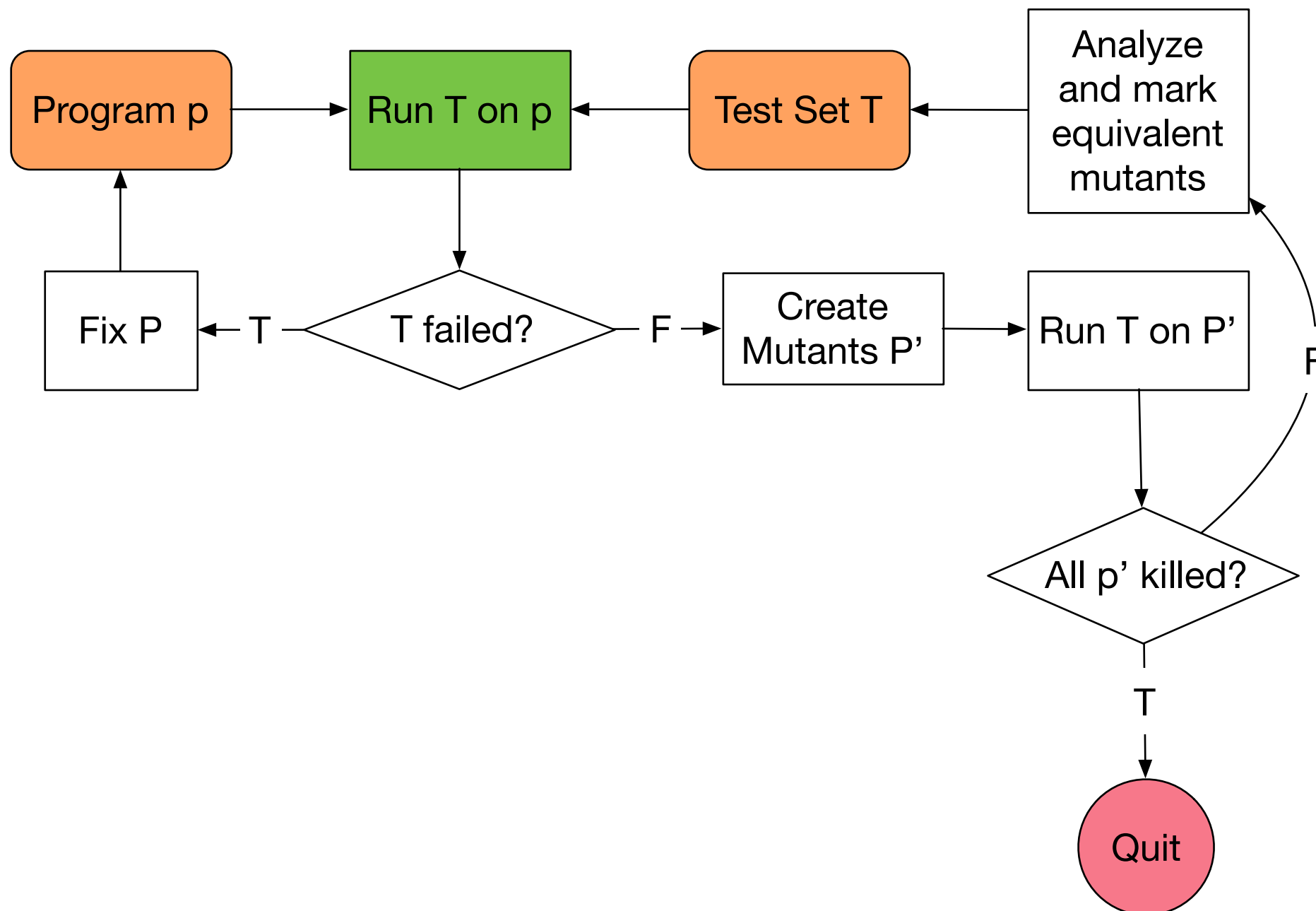
# Regression Testing

- What is it?
  - Testing to ensure that features that worked correctly in the previous build/version still work with the newly added code.
  - In contrast, progression testing tests new functionality.
- How does it help?
  - Ensuring existing unmodified features remain unchanged.
- What sort of tests (aspects of software) qualify for regression testing?
  - Pretty much all sorts of tests

# Is there a good measure of test quality?

- Correctness
- Performance
- SLA
- Safety
- Security
- ...

# Mutation Testing



# Mutation Testing

- Competent Program Hypothesis (CPH)
  - Programmers are competent, which implies that they tend to develop programs close to the correct version
- Coupling Effect Hypothesis
  - Test data that distinguishes all programs differing from a correct one by only simple errors is so sensitive that it also implicitly distinguishes more complex errors
  - Complex faults are coupled to simple faults in such a way that a test data set that detects all simple faults in a program will detect a high percentage of the complex faults
  - Complex mutants are coupled to simple mutants in such a way that a test data set that detects all simple mutants in a program will also detect a large percentage of the complex mutants