Chapter 1 & 2 Highlights

The Fault, Error, & Failure Model

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Adapted from slides by Paul Ammann & Jeff Offutt
Software faults, errors, & failures

**Software fault:** A static defect in software

**Software failure:** External, incorrect behavior with respect to the requirements or other description of the expected behavior

**Software error:** An incorrect internal state that is the manifestation of some fault.

Faults in software are analogous to design mistakes in hardware.

Software does not degrade.
Fault & Failure Model (RIPR)

Four conditions necessary for a failure to be observed

1. **Reachability**: The location or locations in the program that contain the fault must be reached.

2. **Infection**: The state of the program must be incorrect.

3. **Propagation**: The infected state must cause some output or final state of the program to be incorrect.

4. **Reveal**: The tester must observe part of the incorrect portion of the program state.
- Reachability
- Infection
- Propagation
- Revealability