## Chapter 1 & 2 Highlights The Fault, Error, & Failure Model

Brittany Johnson SWE 437

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.

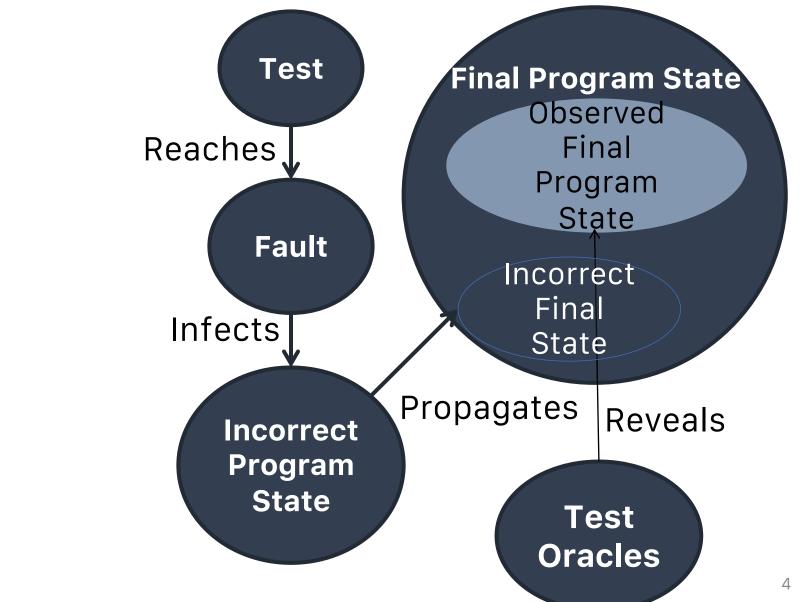
Faults in software are analogous to design mistakes in hardware. Software <u>does not</u> degrade.

## 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.

## **RIPR Model**



- Reachability
- Infection
- Propagation
- Revealability