

What is a computer bug?

- In 1947 Harvard University was the first to build a large-scale computer called the Mark II
 - mechanical relays
 - glowing vacuum tubes
 - technicians program the computer by reconfiguring it
 - Technicians had to change the occasional vacuum tube.
- A moth flew into the computer and was zapped by the high voltage when it landed on a relay.
- Hence, the first computer bug!
 - I am not making this up :-)



Bugs a.k.a. ...

- Defect
- Fault
- Problem
- Error
- Incident
- Anomaly
- Variance
- Failure
- Inconsistency
- Product Anomaly
- Product Incidence
- Feature :-)

Defective Software

- We develop programs that contain defects
 - How many? What kind?
- Hard to predict the future, however...
it is highly likely, that the software we (including you!) will develop in the future will not be significantly better.

Sources of Problems

- **Requirements Definition:** Erroneous, incomplete, inconsistent requirements.
- **Design:** Fundamental design flaws in the software.
- **Implementation:** Mistakes in chip fabrication, wiring, programming faults, malicious code.
- **Support Systems:** Poor programming languages, faulty compilers and debuggers, misleading development tools.

Sources of Problems (Cont'd)

- **Inadequate Testing of Software:** Incomplete testing, poor verification, mistakes in debugging.
- **Evolution:** Sloppy redevelopment or maintenance, introduction of new flaws in attempts to fix old flaws, incremental escalation to inordinate complexity.