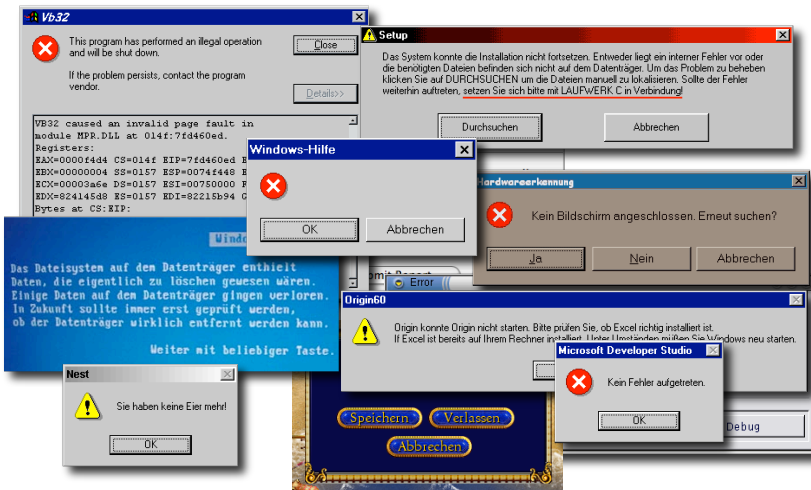


Testing and Debugging

Gordon Fraser and Andreas Zeller
Saarland University

1

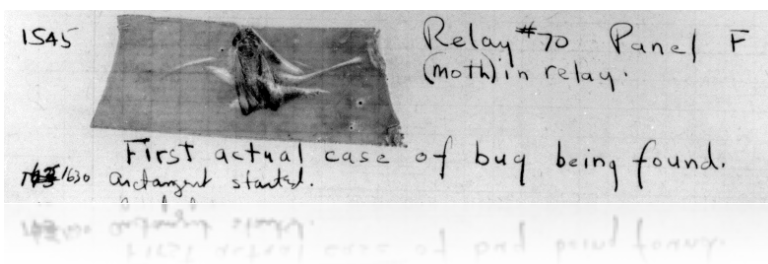
Some Bugs



2

The First Software Bug

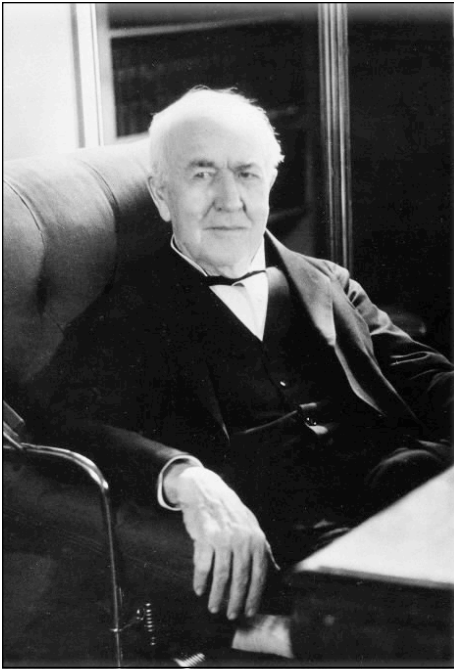
(September 9, 1947)



3

Retrieved by a technician from the Harvard Mark II machine on September 9, 1947.

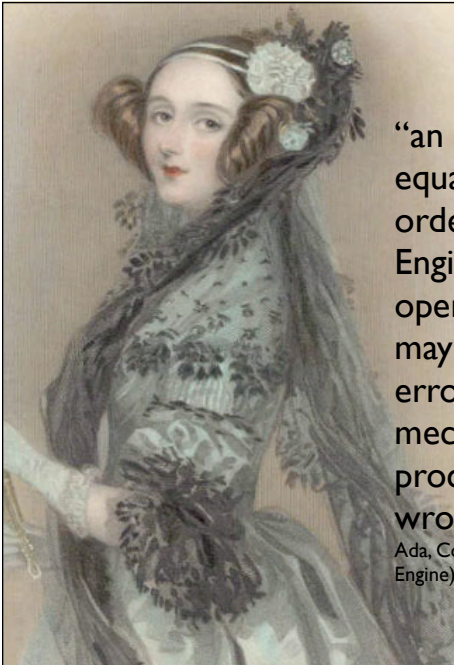
Now on display at the Smithsonian, Washington



“It has been just so in all of my inventions. The first step is an intuition, and comes with a burst, then difficulties arise—this thing gives out and [it is] then that 'Bugs'—as such little faults and difficulties are called—show themselves and months of intense watching, study and labor are requisite. . .”

Thomas Edison

4

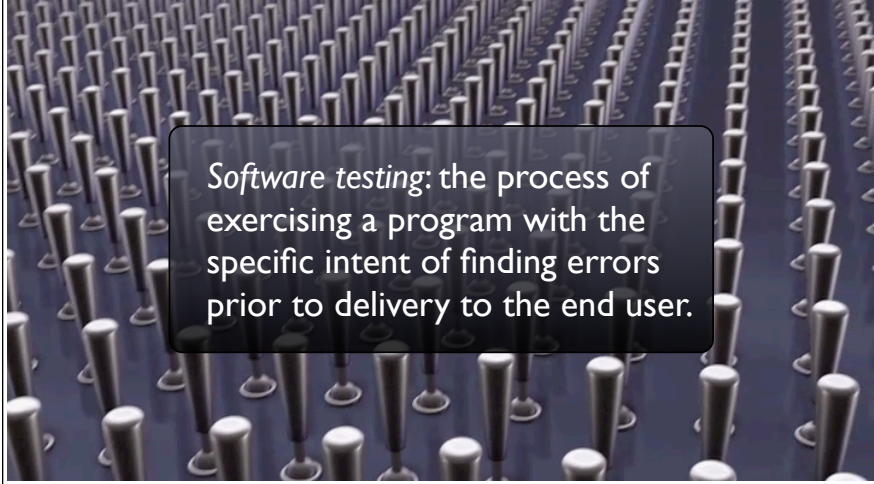


“an analyzing process must equally have been performed in order to furnish the Analytical Engine with the necessary operative data; and that herein may also lie a possible source of error. Granted that the actual mechanism is unerring in its processes, the cards may give it wrong orders. ”

Ada, Countess Lovelace (notes on Babbage's Analytical Engine)

5

Preventing Bugs

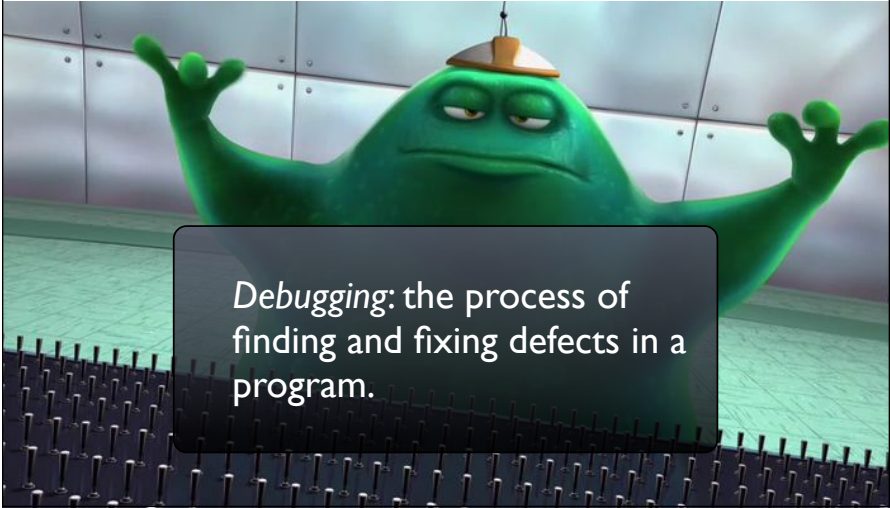


Software testing: the process of exercising a program with the specific intent of finding errors prior to delivery to the end user.

From Pressman, “Software Engineering – a practitioner’s approach”, Chapter 13

6

Curing Bugs



Debugging: the process of finding and fixing defects in a program.

7

Course Topics

8

Your Lecturers



- Andreas Zeller • Gordon Fraser
- Some Guests
- Lecture – Mon+Tue 16:15-17:45 [here](#)

9

Your Tutors

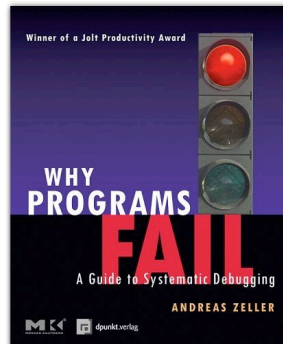
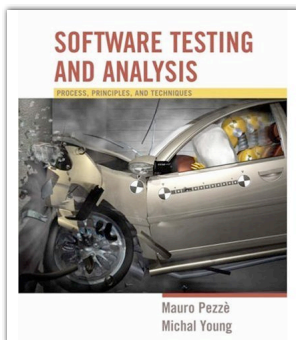
- David Schuler (coordinator)
- Kevin Streit



10

Course Material

<http://www.st.cs.uni-saarland.de/edu/testingdebugging10/>



11

Exams

- Final exam end of term (July 20)
- Extra exam beginning of term (Oct 2010)
- Can do extra exam to improve grade

12

Projects

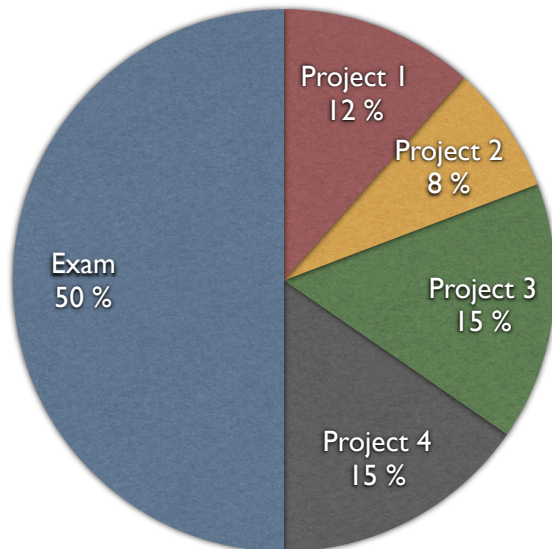
- Project 1: Code coverage + fault localization
- Project 2: Mutation testing
- Project 3: Randomized unit testing + DD
- Project 4: Search-based testing

13

Grading

To pass, you need

- 60% of exam points *and*
- 60% of project points



14

If you've already done Automated Debugging...

- You get 12 CP for both lectures (instead of 9 CP with just this one)
- No debugging lectures required
- No debugging questions in exam

15