CSE 403

Software Engineering

Spring 2023

#23: Debugging

Logistics

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WEEK 8

05/15    L: Code Review

05/16    T: R2                                    DUE: R2!!!

                                                  Release Peer-Review
05/17    L: Debugging                             (RPR)

05/18    P: RPR

05/19    LX: Debbuging
```
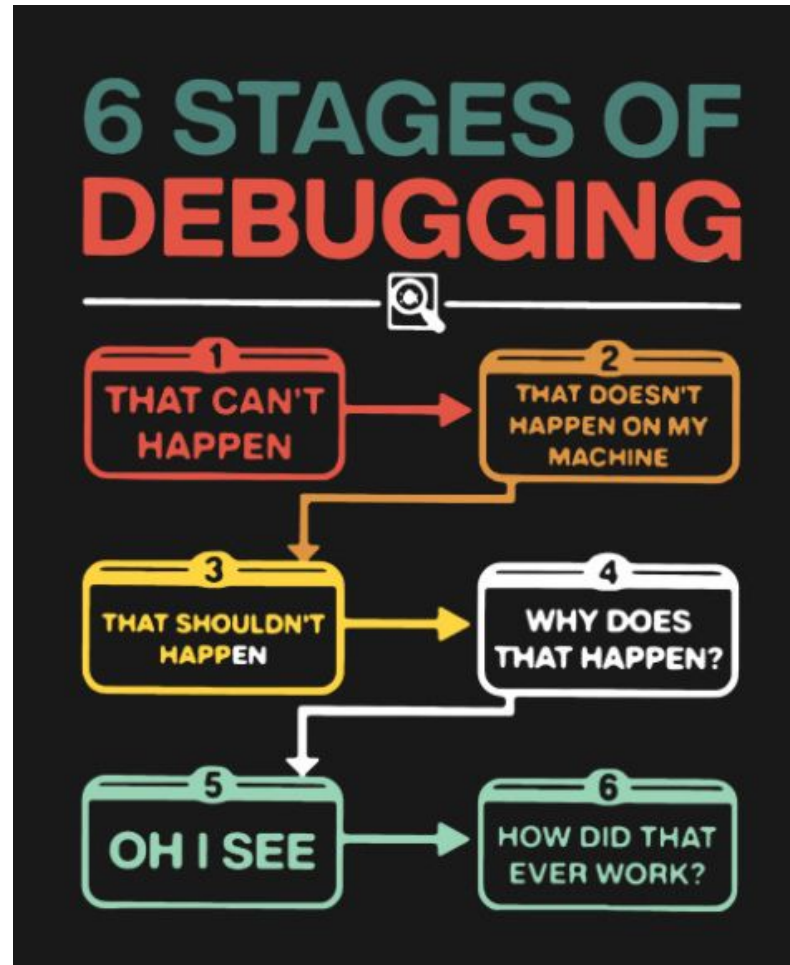
Debugging: What?

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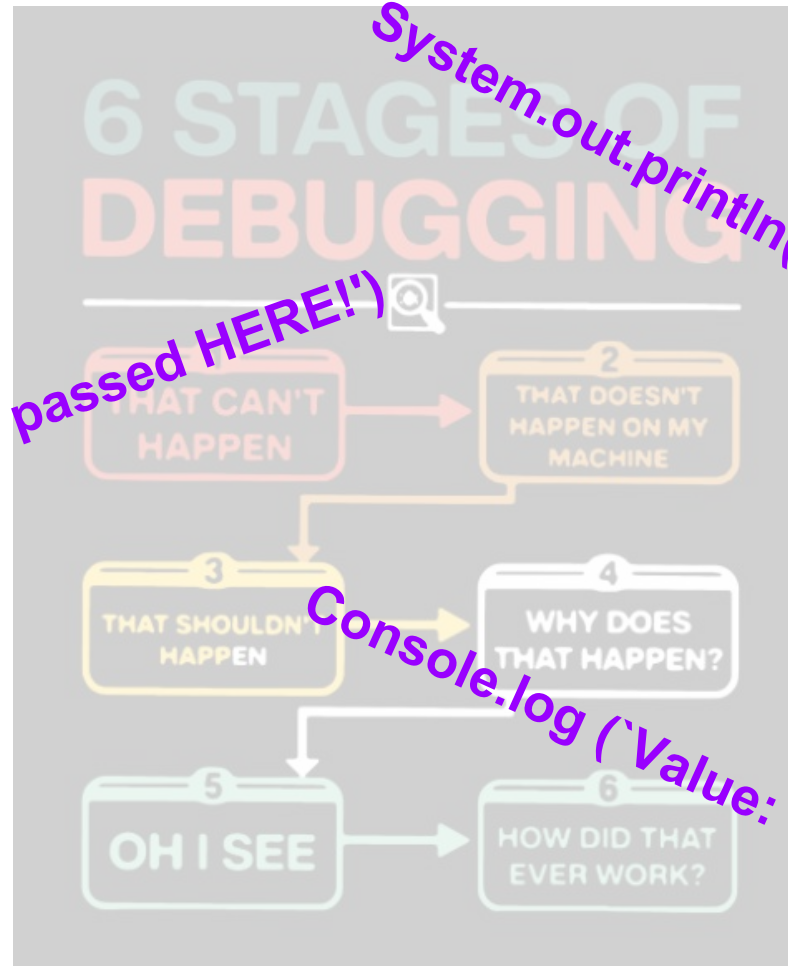*A bug is an **error of flaw** in a program or system that produces incorrect or **unexpected results**.*

*Debugging is the process to **identify** and **resolve** bugs.*

Reference: Dr. Chris Bourke @ University of Nebraska Lincoln [video]

Debugging: A process

Debugging: ~~A process~~ Nah! I got this!

Debugging: A process (a suggestion)

0. Identify & Document

1. Understand & Document

2. Reproduce & Document

3. Investigate & Capture

4. Fix it & Document

Live Example

https://github.com/nigini/SWEng/pulls

0. Identify & Document

Step 1: What the heck?

Step 2: This is broken, yall! (i.e., issue report)

Step 3: Feel like a hero!

1. Understanding (& improve documentation)

How is the program failing?

What are the assumptions to justify this error?

What inputs or conditions are causing the error?
(focus of next in-class activity!)

Is this an error in our understanding?

Is this really a bug in the code?

2. Reproduce (& improve documentation)

Can one replicate the bug?

Can I rule out other issues? (i.e., config, code synch, etc.)

Can I pinpoint a version of the code?

Can I refine the assumptions and conditions?

3. Investigate & Capture

What are my hypotheses about what is wrong?

What are the components involved in this?

Can I narrow down to a Class, method, line?

How can I test my hypothesis?
(print vs debugger vs tests)

How can I CAPTURE the but?
(create an automated way/test to trap this damn bug in the future!)

4. Fix it!

Have I really trapped the bug?

What change will fix the bug?

Remember TDD?
- Trap with a test (red bar)
- Change the code
- Test pass!!!

Logistics

WEEK 8

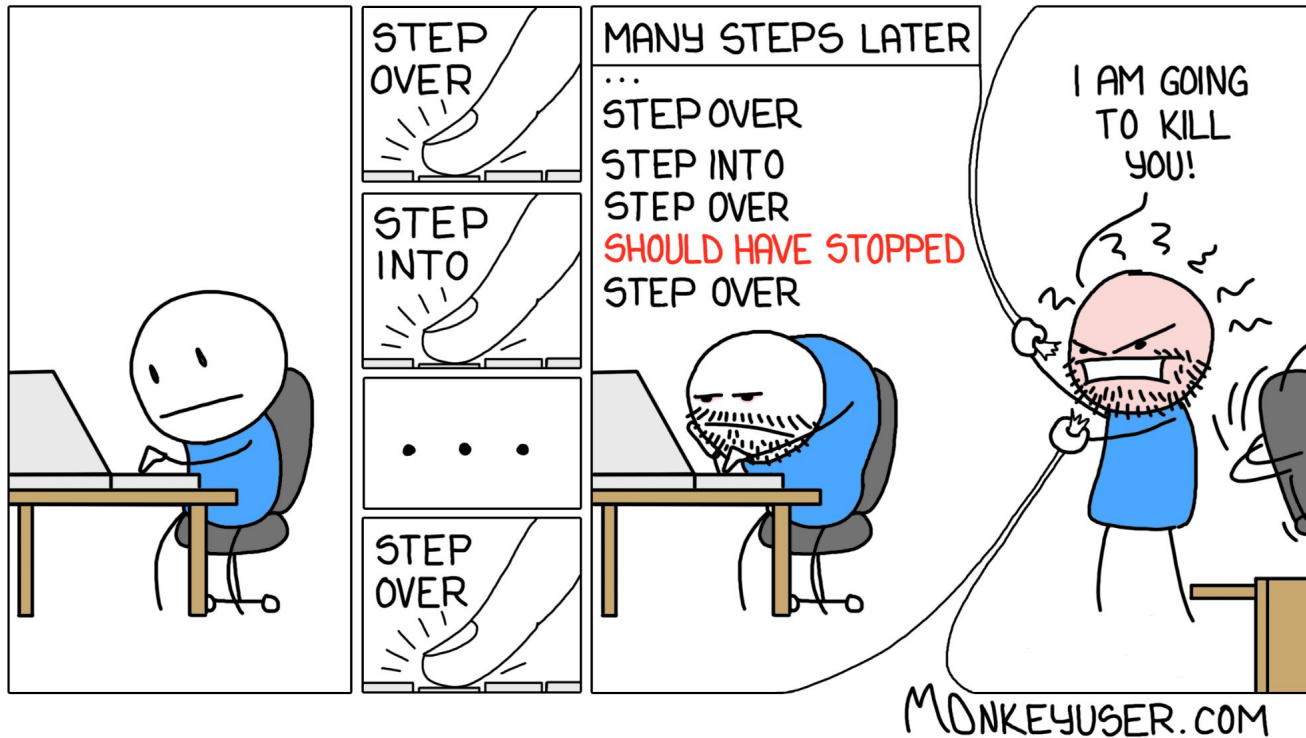|		
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Delta Debugging: finding a minimal set of conditions that expose the bug in complex cases. [VIDEO]

Debugging…

Questions, please!