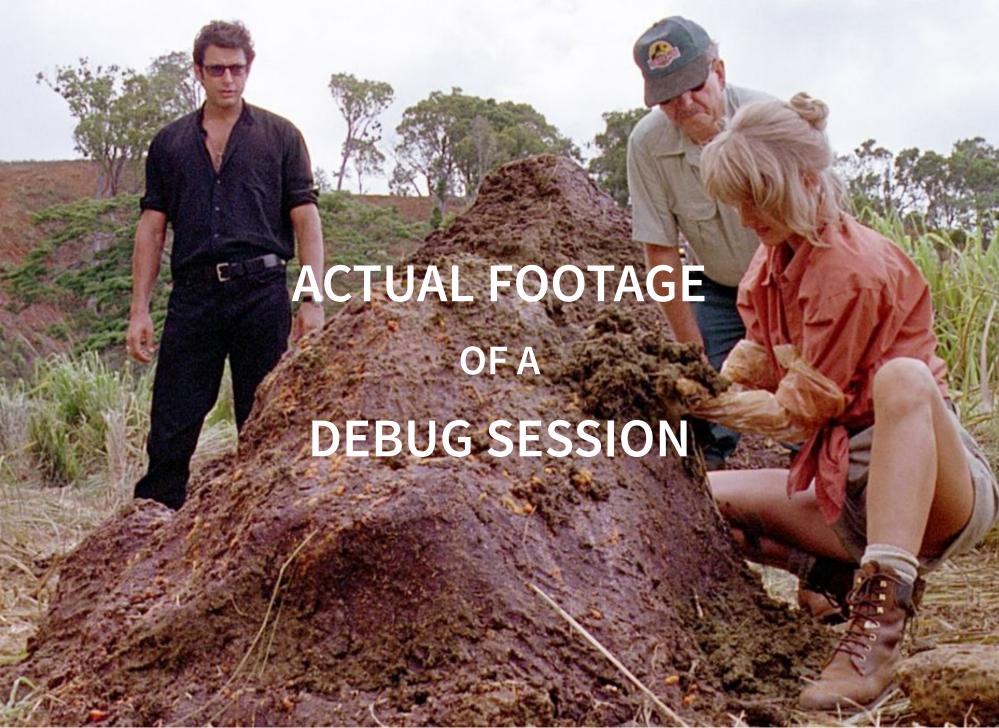# HACK YOUR EDUCATION

WHAT IS DEBUGGING?

Debugging is like being the detective in a crime movie where you are also the murderer.

—Filipe Fortes, Twitter, Nov. 2013

INTRODUCTION

- Debugging is the process of finding and resolving bugs
  - Bugs are defects or problems that prevent correct operation
- Running the application shows us the effects (or symptoms) of errors
  - Not the cause of errors
- It can be hard to identify and pin down problems
  - Remember the computer is only doing what it is told

ACTUAL FOOTAGE

OF A

DEBUG SESSION

FIZZBUZZ

REQUIREMENTS

- **FR1**—Any value divisible by three (3) shall be replaced with "fizz"
- **FR2**—Any value divisible by five (5) shall be replaced with "buzz"
- **FR3**—Any value divisible by fifteen (15) shall be replaced with "FizzBuzz"
- **FR4**—Output for each value shall be printed on a separate line
- **FR5**—Output shall be persisted in a file called "FizzBuzz.log"

EXERCISE 1

- Go to GitHub(https://github.com/bvda/FizzBuzz/tree/fizzbuzz-01)
  - Checkout the branch with `git checkout fizzbuzz-01`

- Fix the errors, so the program is runnable
  - What was the type of errors?
  - How did you find them?

CLASSES OF ERRORS

- Syntax or type errors
  - Always caught and reported by the compiler

- Typos or simple errors
  - Passes type-check
  - Easy to fix when identified

- Implementation errors
  - Wrong use of framework

- Logical errors
  - Logically flawed algorithms

EXERCISE 2

FR4 —Output for each value shall be printed on a separate line

- Go to GitHub(https://github.com/bvda/FizzBuzz/tree/fizzbuzz-02)
  - Checkout the branch with `git checkout fizzbuzz-02`
- Fix the errors, so the program is runnable
  - What was the type of errors?
- Fix the bugs, so the program fulfills FR4

TOOLBOX

- (🪵) Logging
- (🔴) Breakpoints
- (🎯) Problem simplification
- (👓) RTFM (Read The ~~Fucking~~ <u>Fine</u> Manual)
- (🦆) Talk to a friend
- (🚶) Take a walk

EXERCISE 3

FR5 —Output shall be persisted in a file called "FizzBuzz.log"

- Go to GitHub(https://github.com/bvda/FizzBuzz/tree/fizzbuzz-03)
  - Checkout the branch with `git checkout fizzbuzz-03`
- Fix the bugs, so the program fulfills FR5
- Clean up the code

APPROACH

- Reproduce the problem
- Reduce the problem
- Apply tools
- ????
- Profit

APPROACH

- Reproduce the problem
- Reduce the problem
- Apply tools
- ????
- Profit

Hello 👋, Professor Kirk 😏

EXERCISE 4

FR3 —Any value divisible by fifteen (15) shall be replaced with "FizzBuzz"

FR6 —Users to specify "Fizz" and "Buzz" values.

- Go to GitHub (https://github.com/bvda/FizzBuzz/tree/fizzbuzz-04)
  - Checkout the branch with `git checkout fizzbuzz-04`
- Fix the errors, so the program fulfills FR3
- Implement FR6

ASK QUESTIONS THE SMART WAY

- Describe the <mark>symptoms</mark> of your problem
  - Be careful and clear

- Describe your own <mark>research</mark>
  - What did you try to do to understand the problem?

- Describe the diagnostic <mark>steps</mark> you took
  - What did you do to pin down the problem?

- Provide a way to <mark>reproduce</mark> the problem
  - In a runnable, controlled environment

WRAP-UP

- Identification
  - What is the error type?

- Resolution
  - Reproduction
  - Reduction

- Miscellaneous
  - Ask questions the smart way
  - Treat `Warnings` as `Errors`

HYE PARTICIPANTS ARRIVING AT A CRIME SCENE