

Game Engineering

CS420-2016S-10

Debugging

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10-0: Debugging

- Your code is misbehaving. What do you do?
 - What is the first step for debugging?

10-1: Debugging

- Step I:
 - Reproduce the bug!
 - Find a method that consistently displays the unwanted/unexpected behavior
 - Find the *smallest possible* case that displays the problem
 - If necessary, change your code (#ifdefs, comments) to make it as simple as possible while still showing the problem

10-2: Debugging

- Step II:
 - Determine the “edges” of the bug
 - That is, under what conditions does the bug appear? Disappear?

10-3: Debugging

- Step III:
 - Once you know exactly when & where the bug appears, you should have a good idea about where in the code the problem shows up
 - This is not where the problem *is*, necessarily, just where the problem is *seen*
 - Time to break out the tools

10-4: Using the tools

- Breakpoints, call stacks, watches
- Looking through the callstack
- Breakpoints on data changes

10-5: Examples

- Debugging Example 1

10-6: Examples

- Debugging Example 1
 - Overwriting data by going past bounds of an array

10-7: **Examples**

- Debugging Example 2

10-8: Examples

- Debugging Example 2
 - Overwriting “this” pointer

10-9: Examples

- Debugging Example 3

10-10: Examples

- Debugging Example 3
 - Interpreting the data as the wrong type

10-11: Examples

- Debugging Example 4

10-12: Examples

- Debugging Example 4
 - Maintaining a pointer to data on the stack

10-13: Examples

- Debugging Example 5

10-14: Examples

- Debugging Example 5
 - Destructor without copy constructor
 - Rule of 3:
 - Constructor
 - Copy Constructor
 - Copy Assignment Operator
 - If you have one, you probably need all three
 - ...

10-15: Examples

- Tank example
 - No tanks can move ... why?

10-16: Examples

- Checking for collisions
 - Array of tanks
 - Check each tank for collisions with all other tanks
 - No tank can move

10-17: Examples

- Checking for collisions
 - Array of tanks
 - Check each tank for collisions with all other tanks
 - Each tank collides with itself

10-18: Examples
