Game Engineering

CS420-2016S-10

Debugging

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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
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
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
Examples

- Debugging Example 4
10-12: Examples

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

- Debugging Example 5
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?
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