

The joys of debugging

- Having to debug code is part of a devs life
- A few habits and techniques can make it less painful
- Coding techniques to minimize debugging stress
- Good use of tools
- Debugging techniques/strategies

Write code that's easier to debug

- Good comments, clear layout, clear identifiers
- Modular, good use of abstraction
- Good error checking, close to point where data is captured/generated
- Check validity of parameters, check status/return values from functions
- Initialize your variables
- Check array bounds and iteration limits

Make good use of tools

- Use a good editor: with syntax highlighting, bracket matching, movement within the file
- Use good warning/error compiler options/settings
- Use a good debugger with an effective debugging plan

Simple ideas

- Try to find a minimal set of steps to reproduce the bug (give a clearer idea of what leads to the bug)
- Try explaining the problem code to someone (a friend, a co-worker, your cat...) - vocalizing the explanation often triggers a realization of what's happening
- Get another programmer to look it over (fresh eyes can often spot a problem we've gone blind to)
- Take a break and clear your head

Binary bug search

- Try to narrow the scope of where the problem lies:
- Check the “middle” of the program – is everything still ok there? If so then the problem is in the second half, otherwise the problem is in the first half
- Repeat the process recursively – check in the “middle” between the last spot where things are ok and the first spot where there is clearly a problem

Hypothesis/validation

- Try to come up with a few ideas of what/where the problem might be
- For each idea, try to come up with test data that will help confirm or reject each hypothesis
- Use either a debugger or extra code to set/display values of key variables/parameters during the program run to test your hypothesis

Debugger features

- Many different debuggers available, core features common to most
- set/clear breakpoints – points where program will pause execution and allow the dev to give further instructions
- view/change variable/parameter/memory values
- Step forward one or more instructions
- Examine current call stack (which function calls are currently active, see stack frame info for each)