

Debugging Method

Computing

A procedure for finding a bug, rather than guessing at it.

The order matters — each step depends on the previous one holding.

1

Reproduce it

Reliably, on demand. An intermittent bug is a bug you cannot verify you fixed.

2

Reduce it

Strip away everything that is not needed to trigger it.

3

Form one hypothesis

State what you believe and what would disprove it.

4

Test that one thing

Change a single variable. Two changes means an ambiguous result.

5

Fix the cause

Then add a test that fails without the fix.

WHEN STUCK

Explain it aloud to someone, or to a duck

Question an assumption you have not checked

Bisect: what changed since it worked?

The bug is almost always in your code, in the last thing you changed, and it is almost always something you assumed.