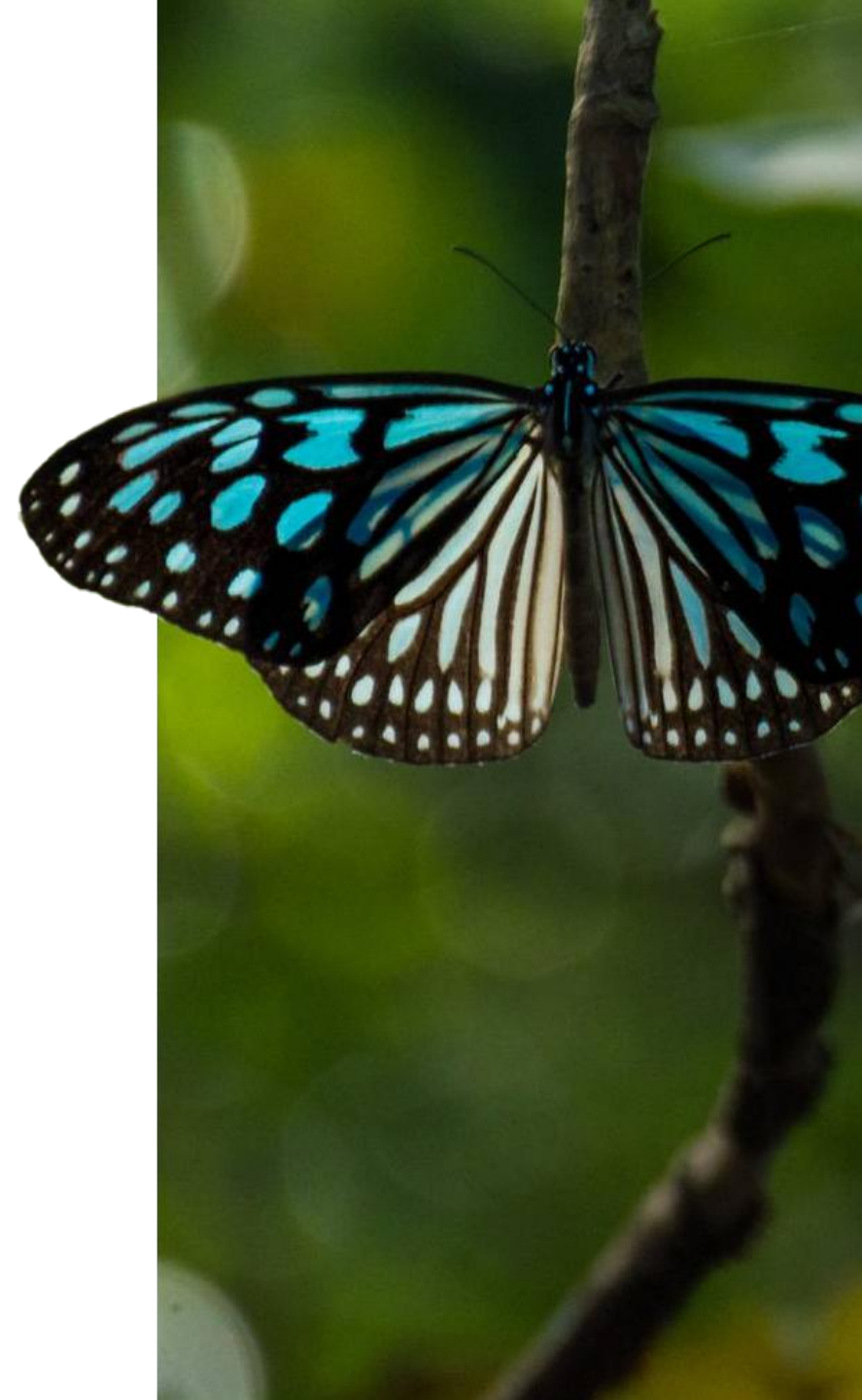


DEBUGGING JAVA



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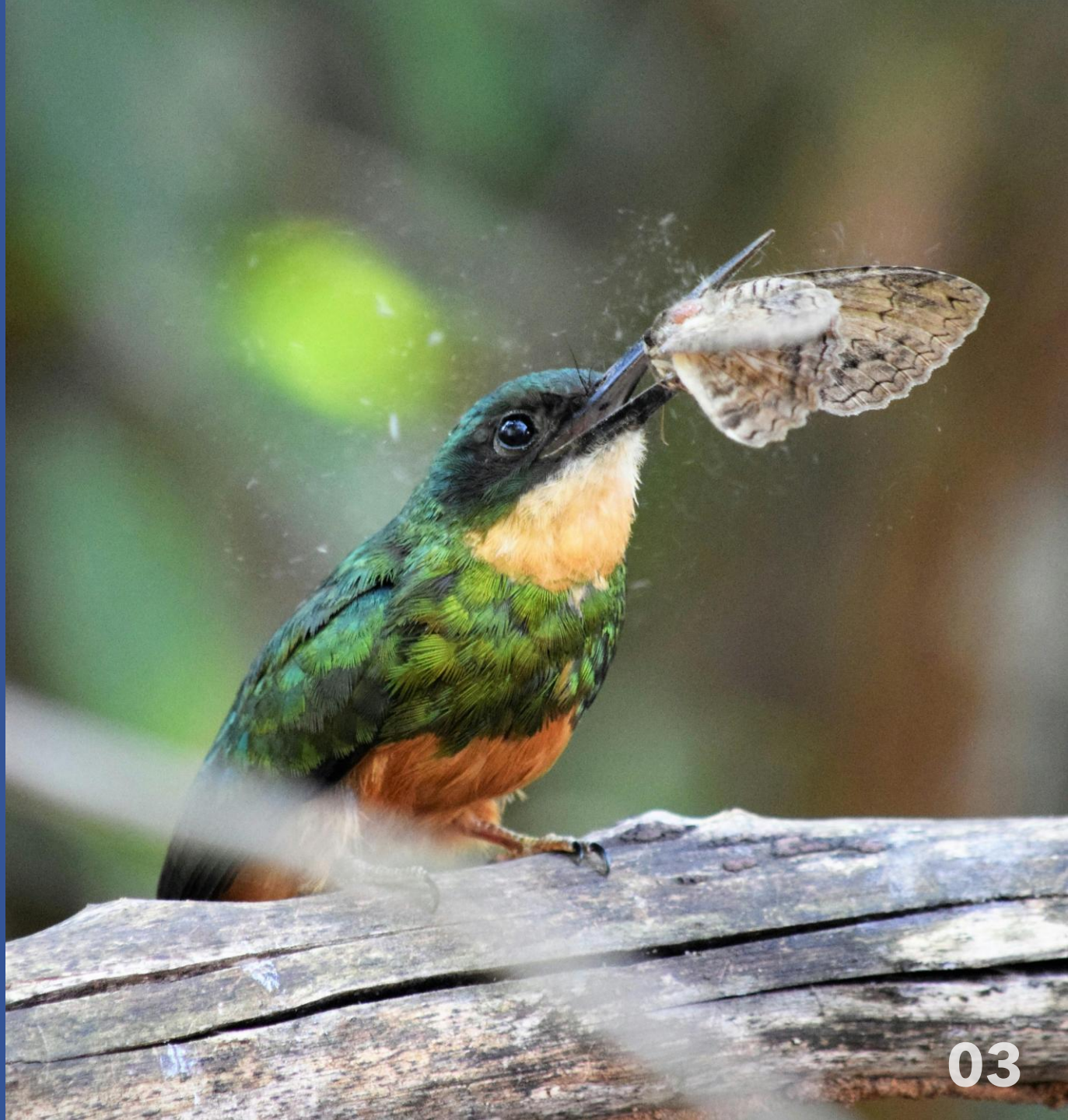
The best developers vs. the worst developers

A close-up photograph of a tamandua, a small anteater, in a grassy field. The animal is using its long, brown, pointed snout to dig into the ground. Its body is covered in dark, shaggy fur, and its legs are visible. The background is a soft-focus field of green and brown grass.

- **Find bugs in less than 1/3 of the time**
- **Create less than half as many defects**

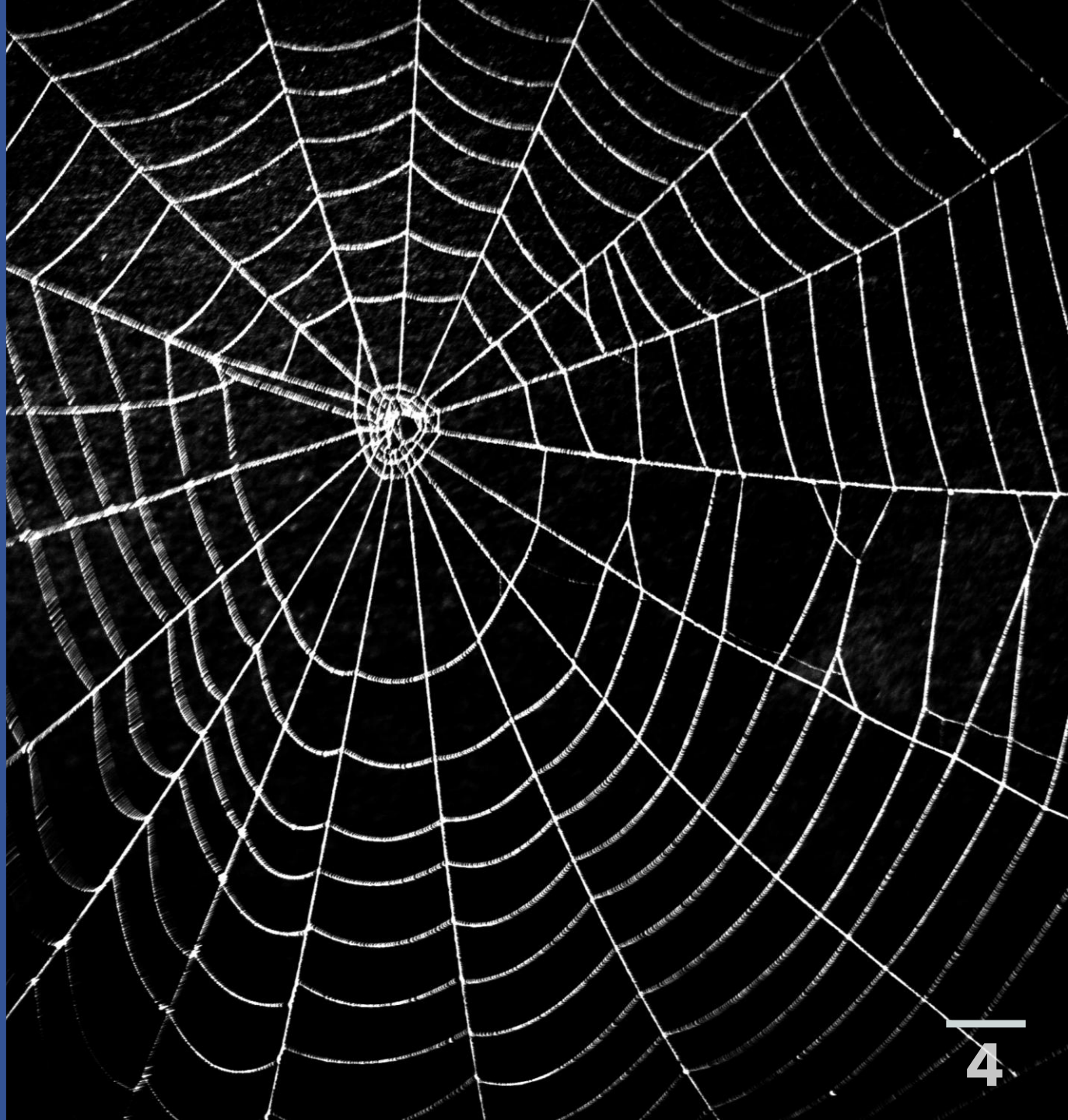
Be one of the BEST!

- Reporting
- Testing
- Hunting



AUTOMATE

Reproduce the problem
the same way every time
– without having to think
about how.



Keep a journal

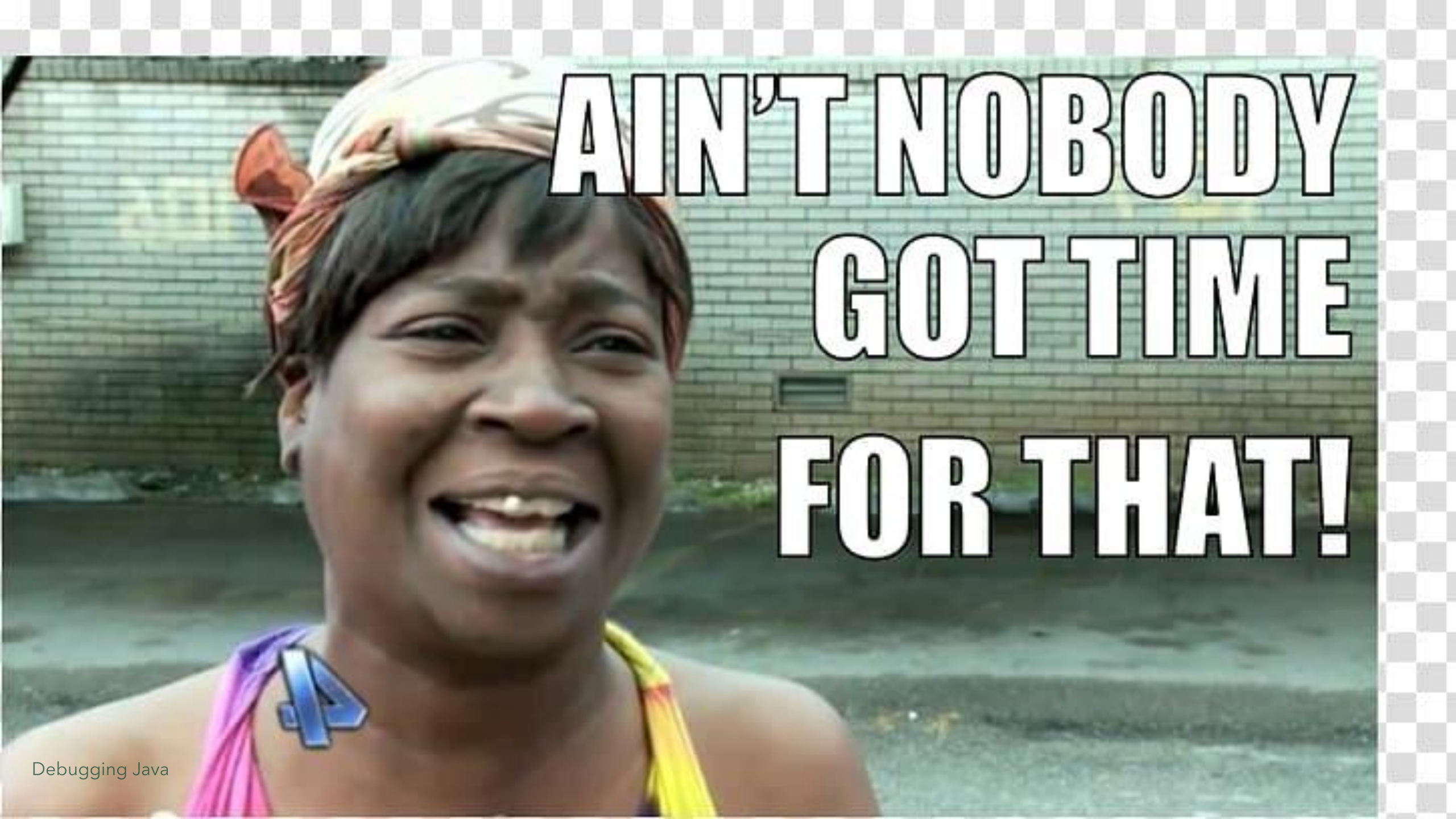
THIS IS IMPORTANT!

Write it down!



Wordle

B	O	N	G	O
H	E	A	L	S
S	M	I	T	E
S	P	I	E	D
S	K	I	E	S
S	K	I	E	R



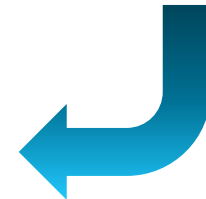
**AIN'T NOBODY
GOT TIME
FOR THAT!**

Google

Search bar containing a magnifying glass icon, a vertical line cursor, and icons for voice search and image search on the right.

Google Search

I'm Feeling Lucky



The Debugger!

Now THAT's what I'm talking about!



The Debugger!

When?



The Debugger!

When you know where to start looking!



The Debugger!

Exception: Stack Trace

Bad Output: Source of output

Unexpected Operation: Break and step back

Corrupt data: Write point



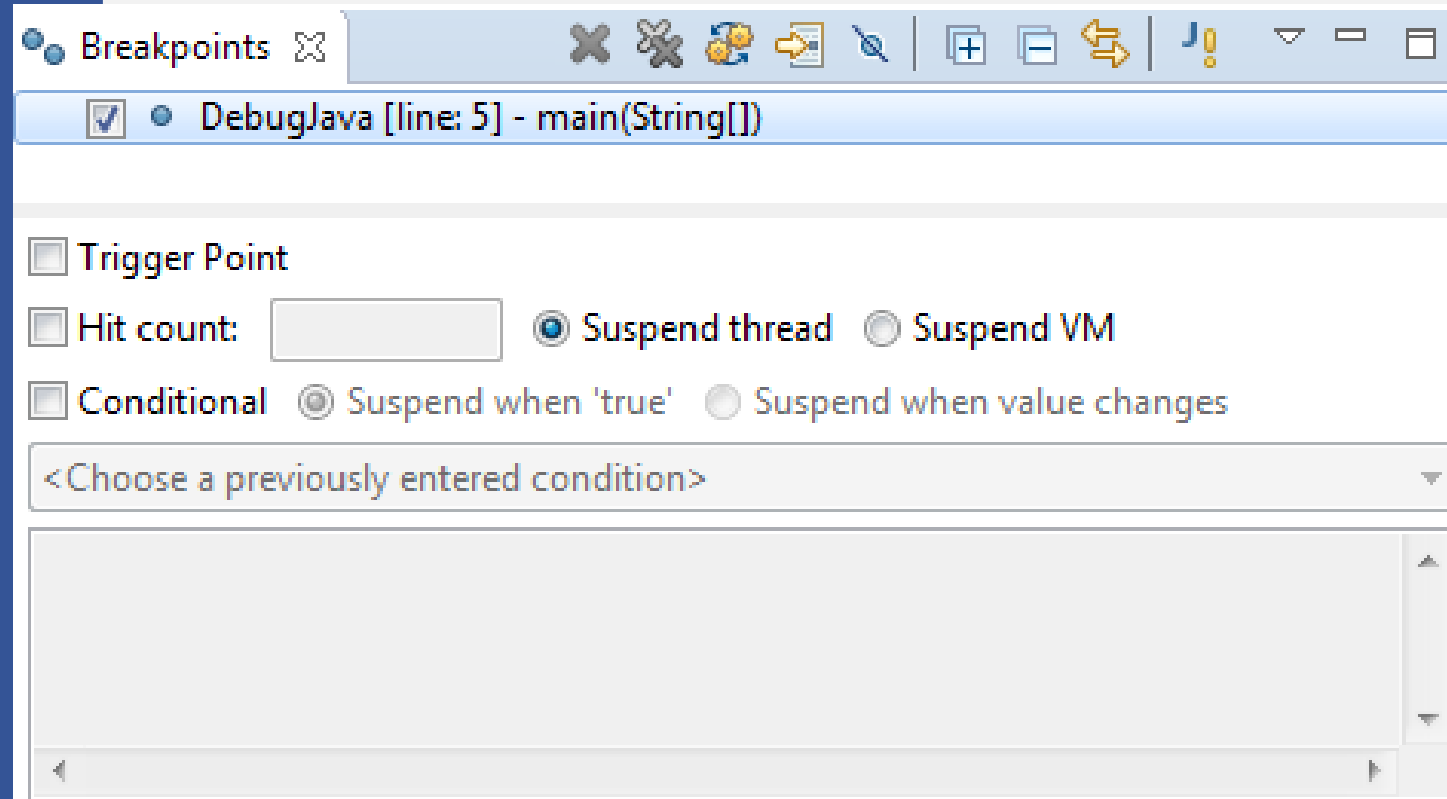
DEMO TIME!

IntelliJ Debugger



Eclipse Alternatives

Breakpoint Settings



Eclipse Alternatives

Conditional Breakpoints

Line Breakpoint

Type: DebugJava

Line Number: 8

Member: main(String[])

☒ Enabled

☐ Trigger Point

☐ Hit count: ☒ Suspend thread ☐ Suspend VM

☒ Conditional ☒ Suspend when 'true' ☐ Suspend when value changes

<Choose a previously entered condition>

```
if (b )  
    return true;
```

Eclipse Alternatives

Watchpoints

Watchpoint

Type: DebugJava
Field: integer

☒ Enabled

☐ Trigger Point

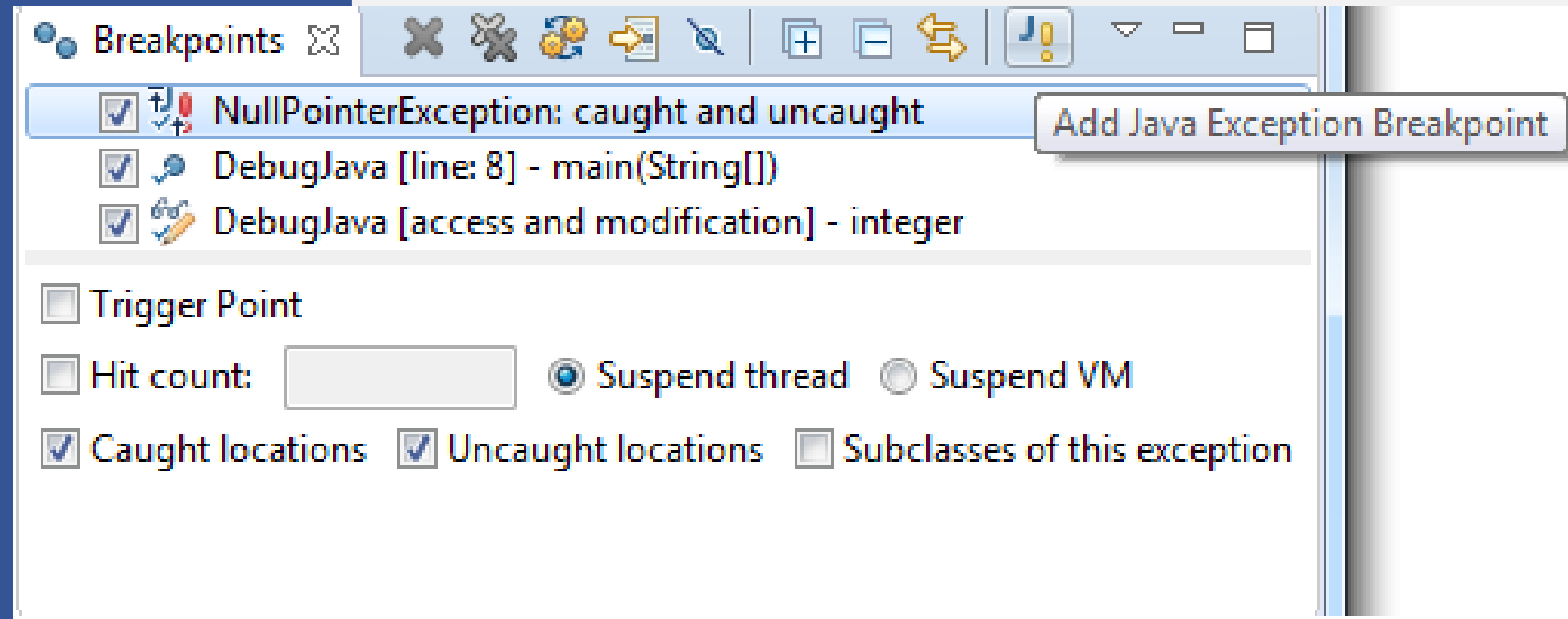
☐ Hit count:

☒ Suspend thread ☐ Suspend VM

☒ Access ☒ Modification

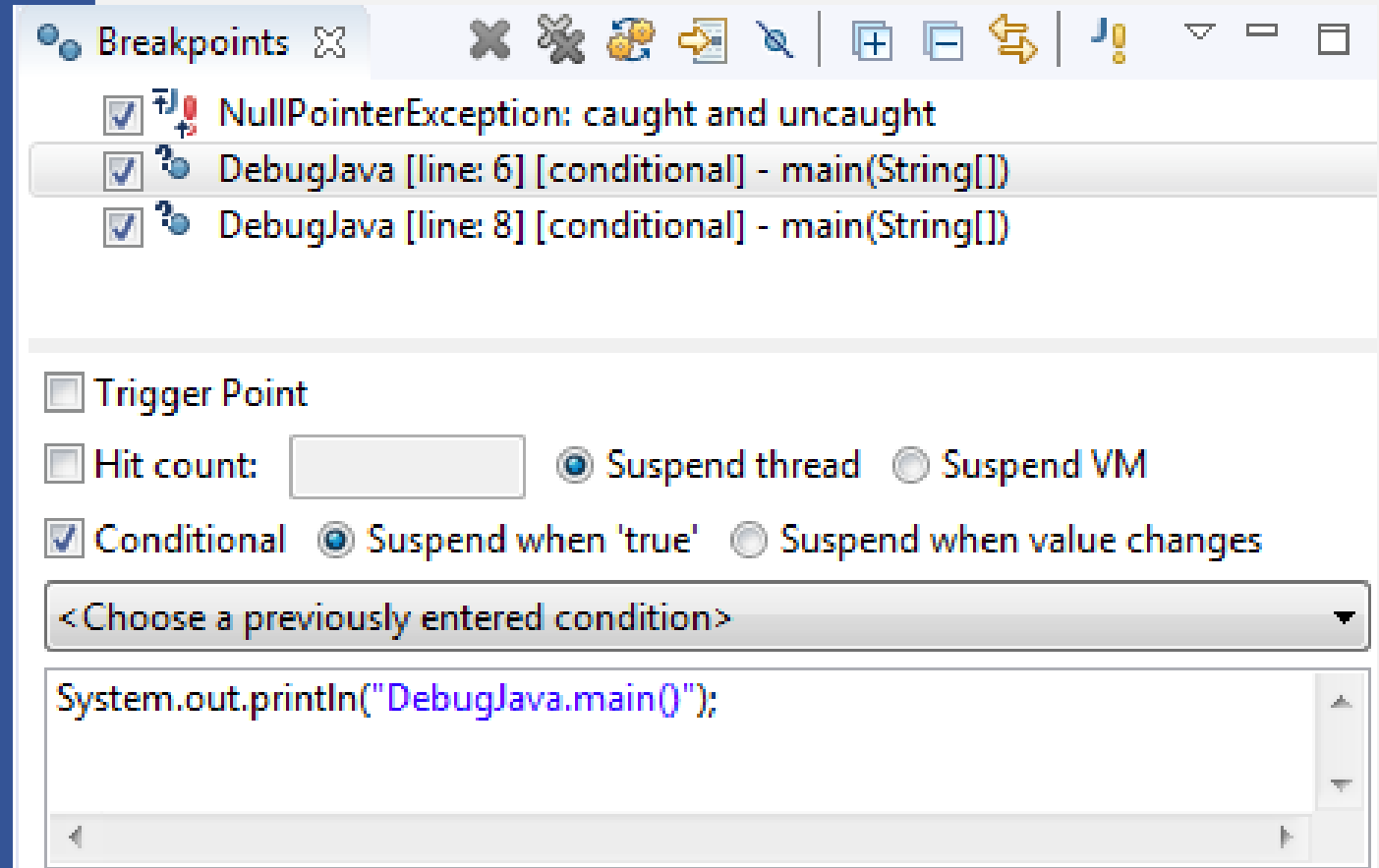
Eclipse Alternatives

Exception Breakpoints



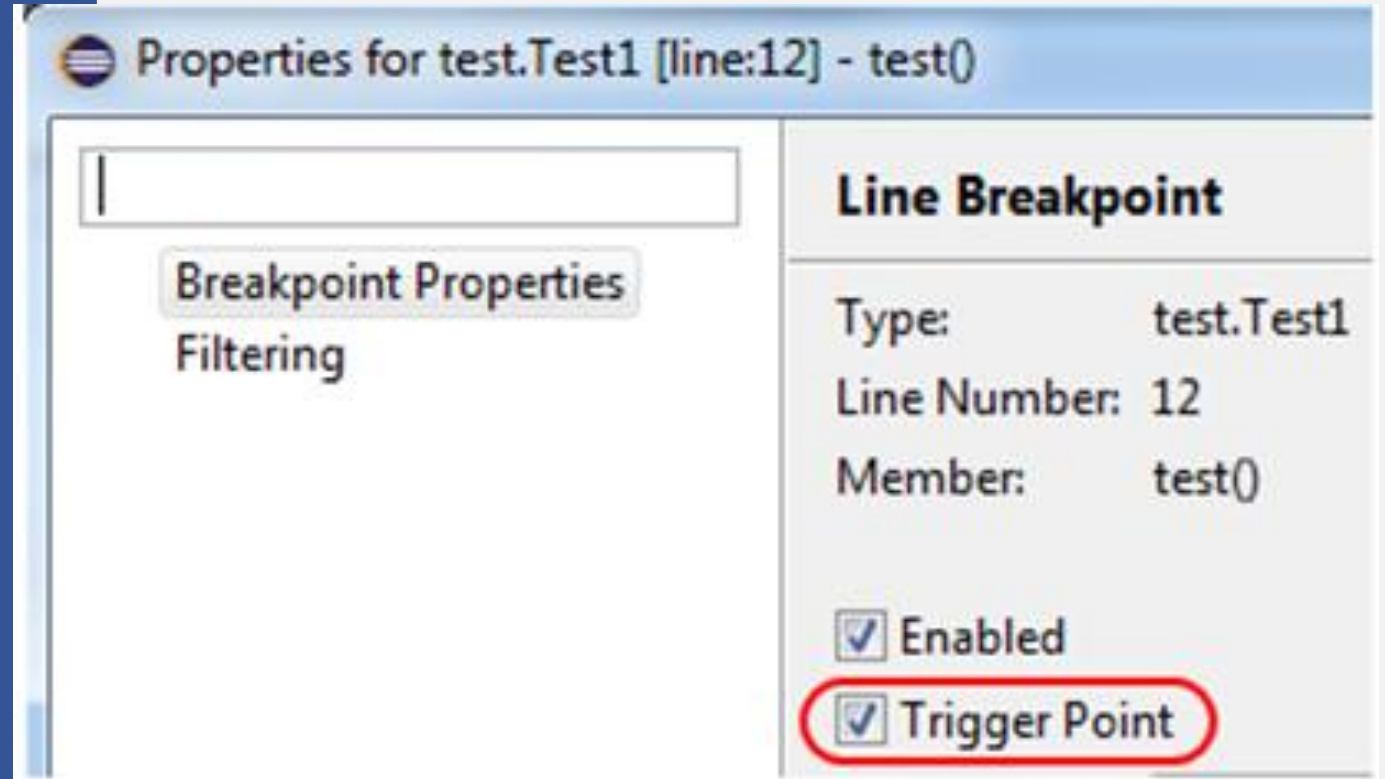
Eclipse Alternatives

Tracepoints



Eclipse Alternatives

Trigger Points



Other Tools



Memory Analyzer (MAT)

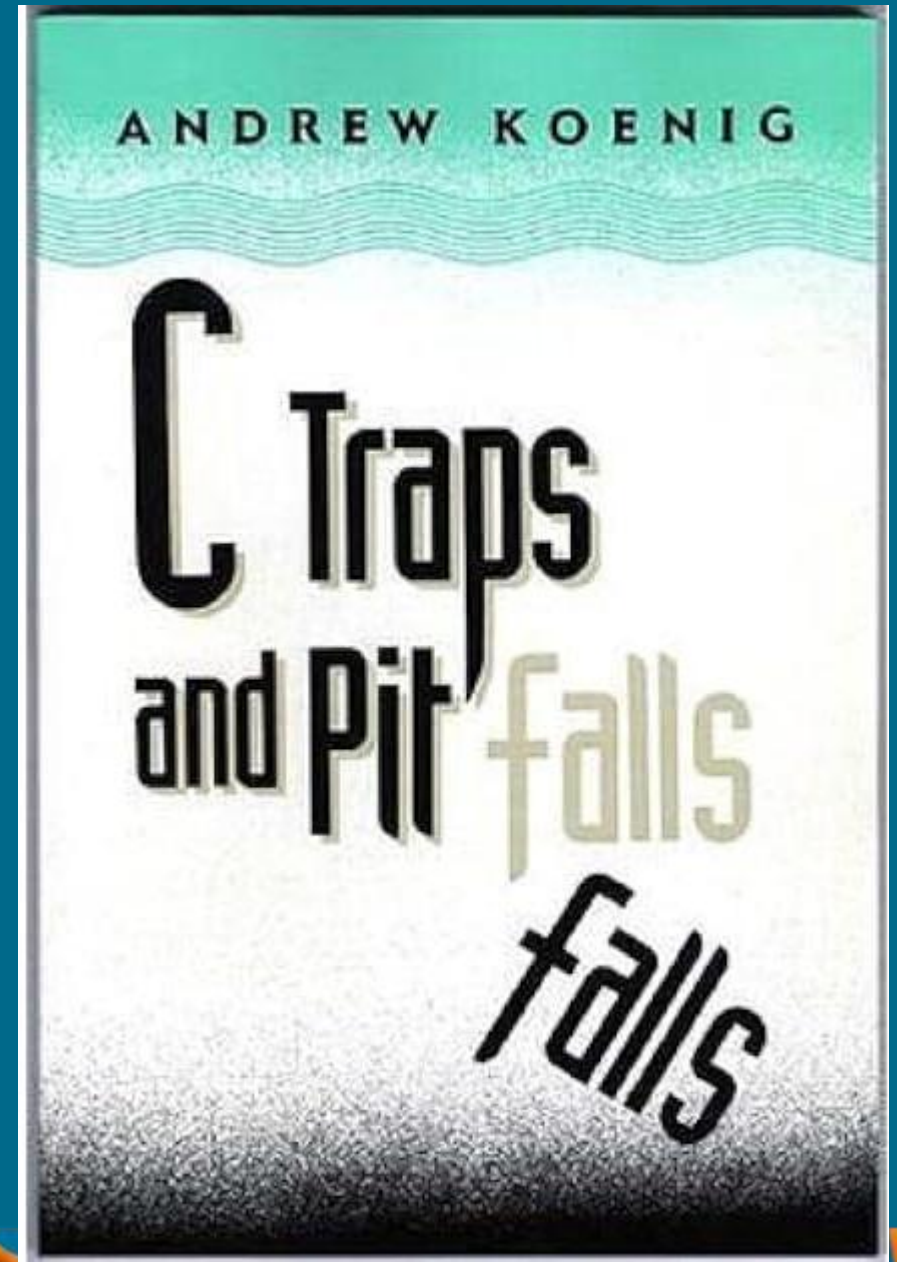
Java Flight Recorder

Don't do it alone: Consult a friend

EXPERIENCE MATTERS

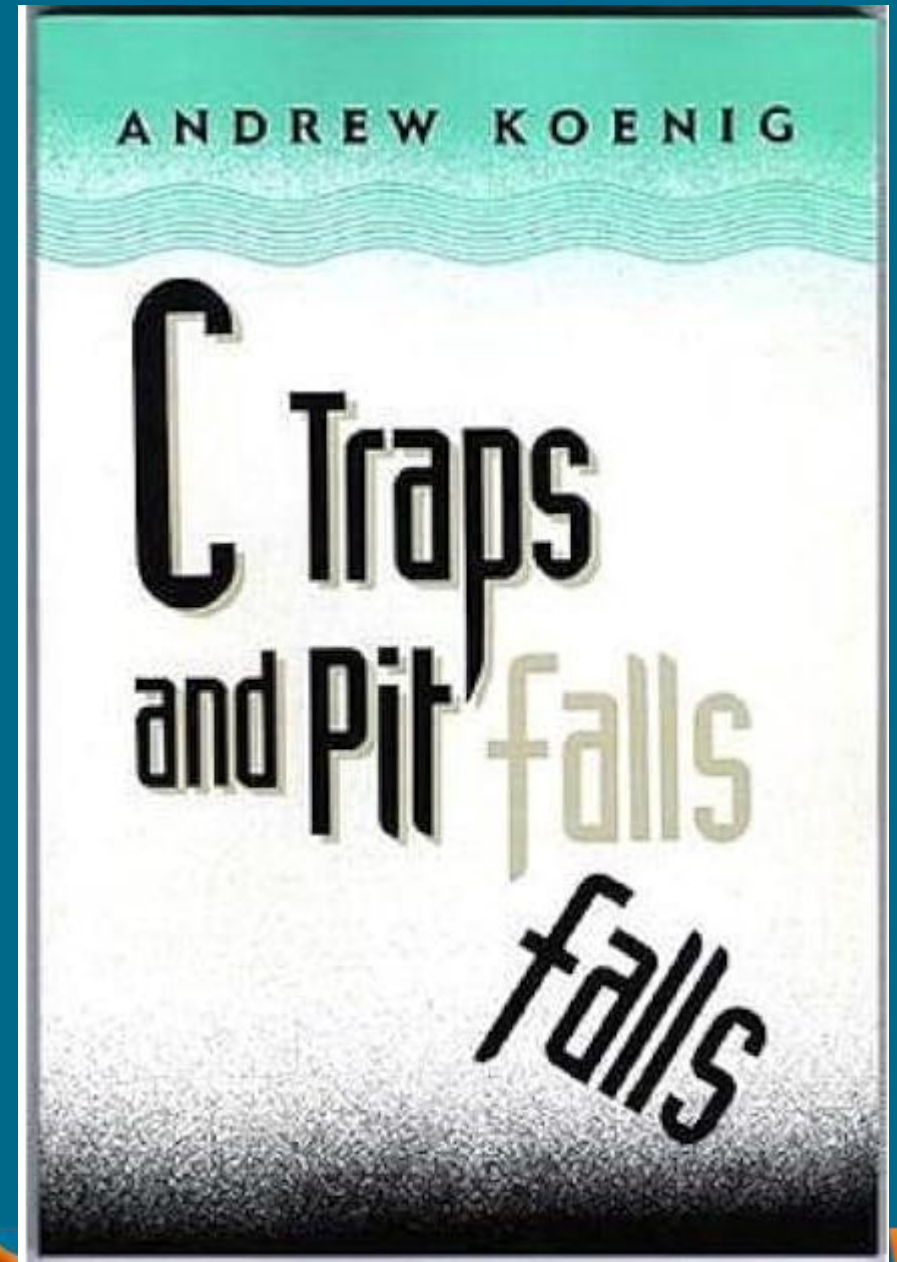


EXPERIENCE MATTERS

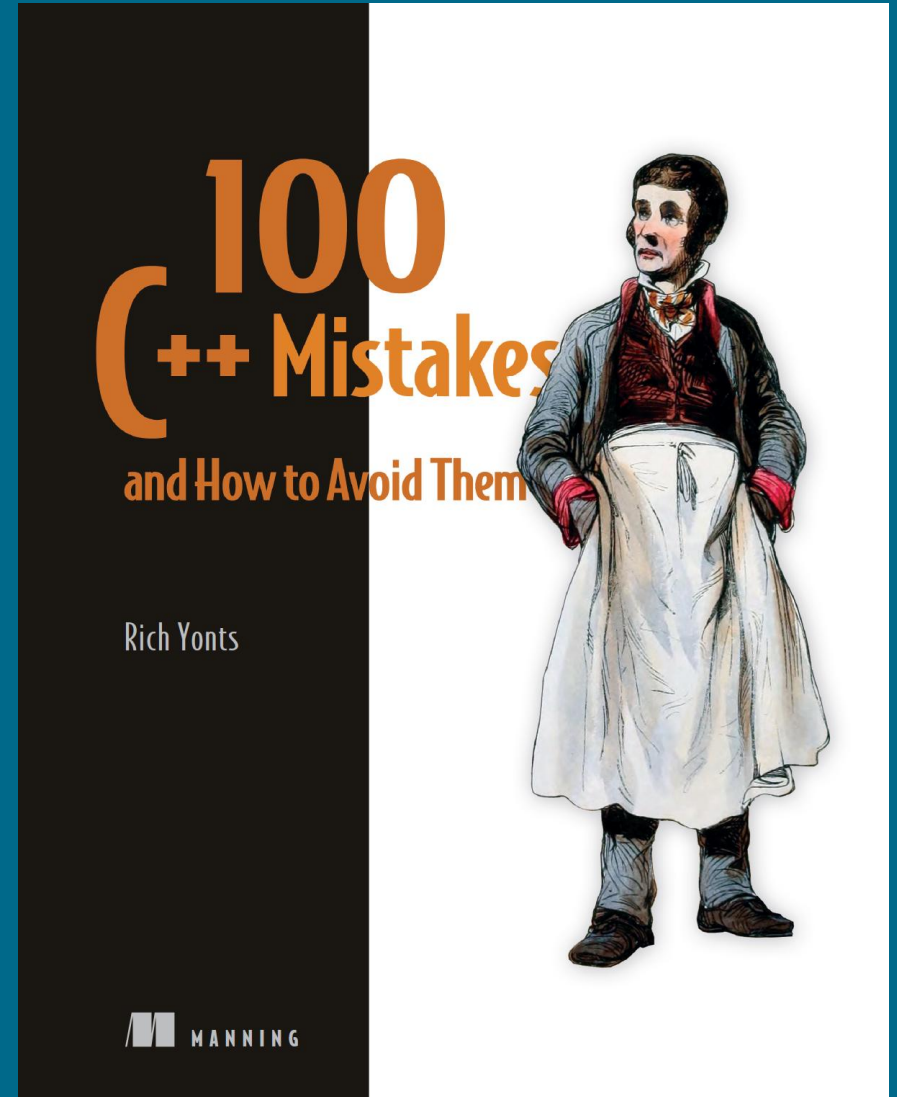


EXPERIENCE MATTERS

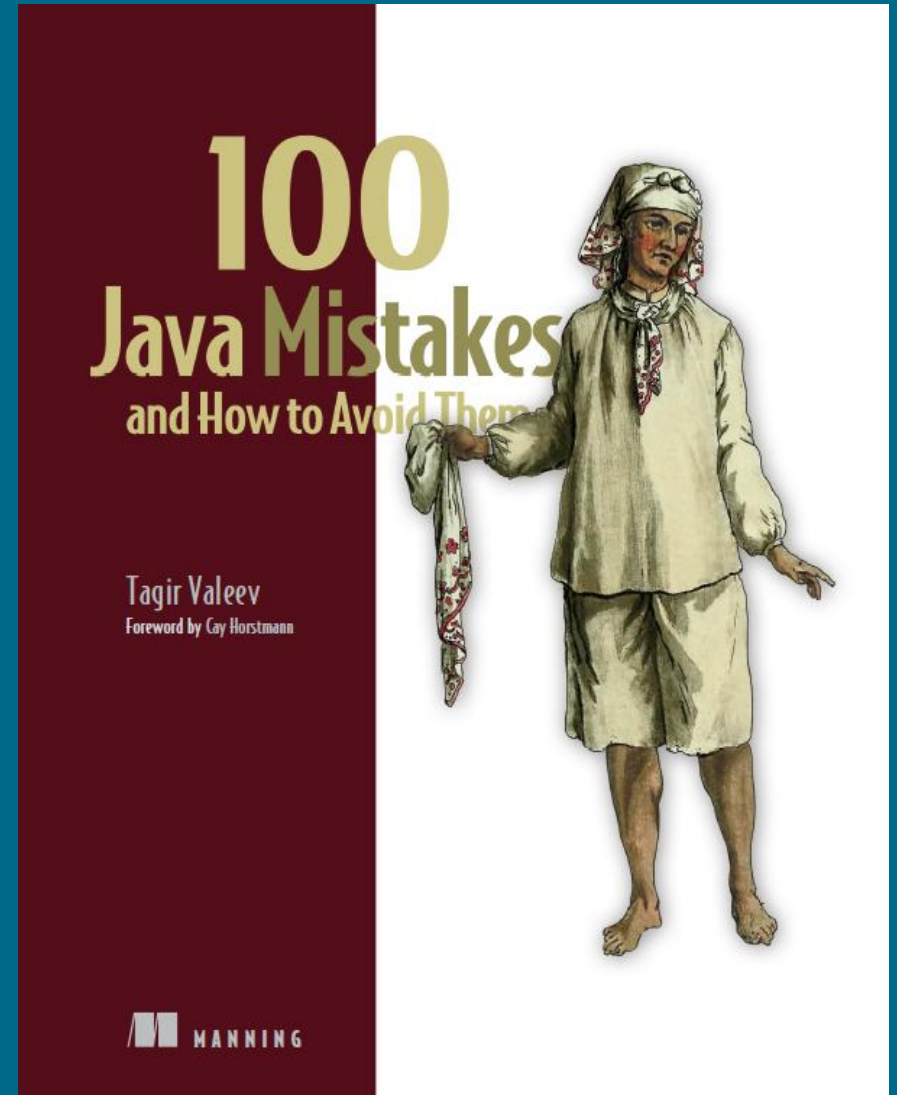
```
if (x = 3) {  
    y++;  
}
```



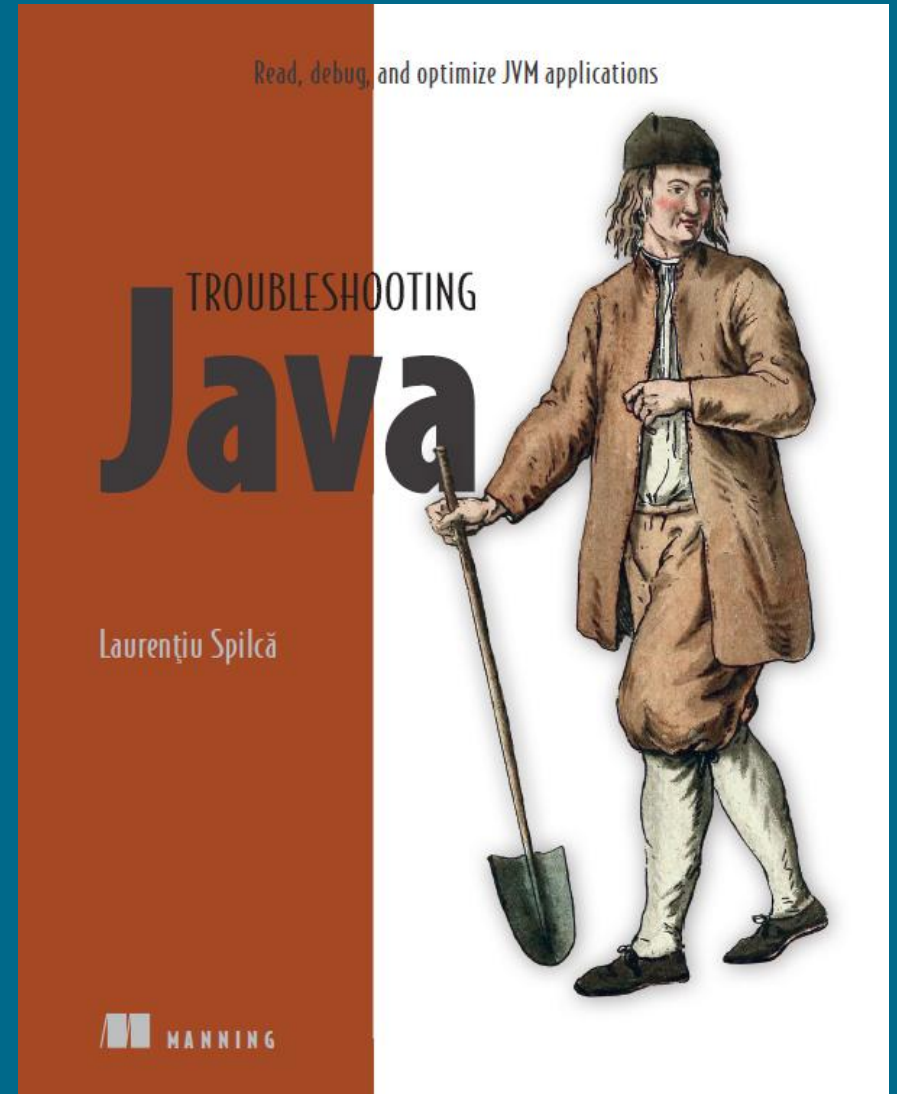
EXPERIENCE MATTERS



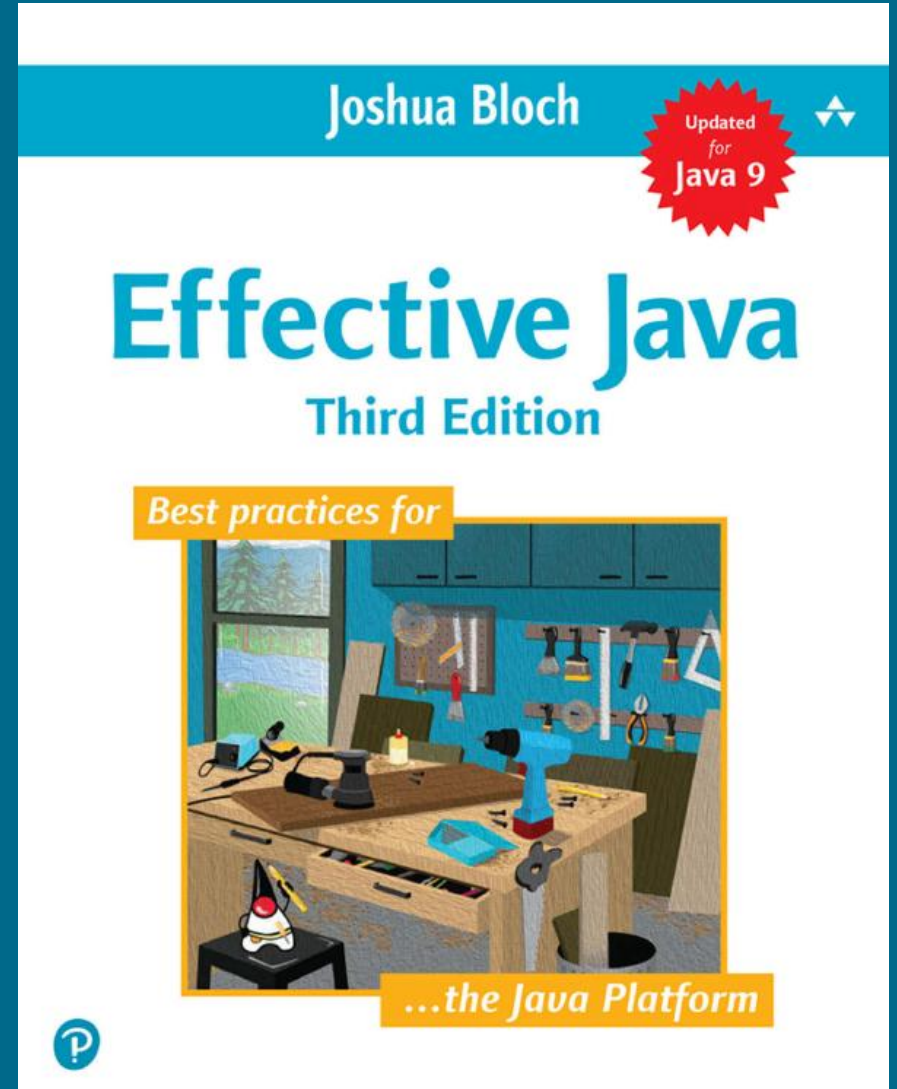
EXPERIENCE MATTERS



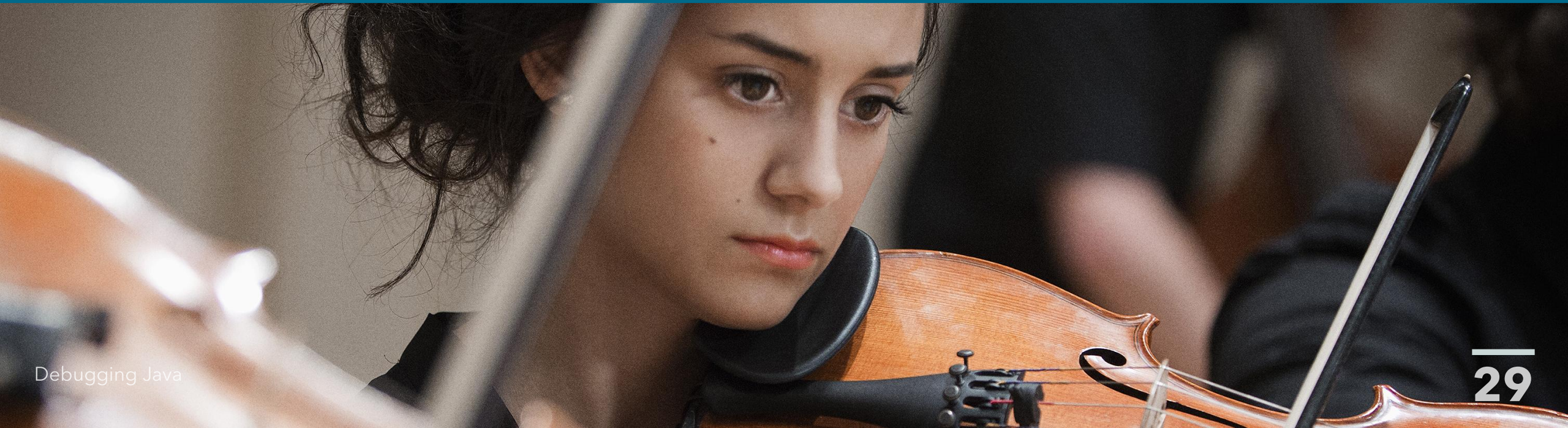
EXPERIENCE MATTERS



EXPERIENCE MATTERS



You don't improve during a performance



**Do you really want
to be a master
debugger?**



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