How much does OOP cost?

Seminar

30.05.2023 Zakharov Vladimir

Experiment
Hardware

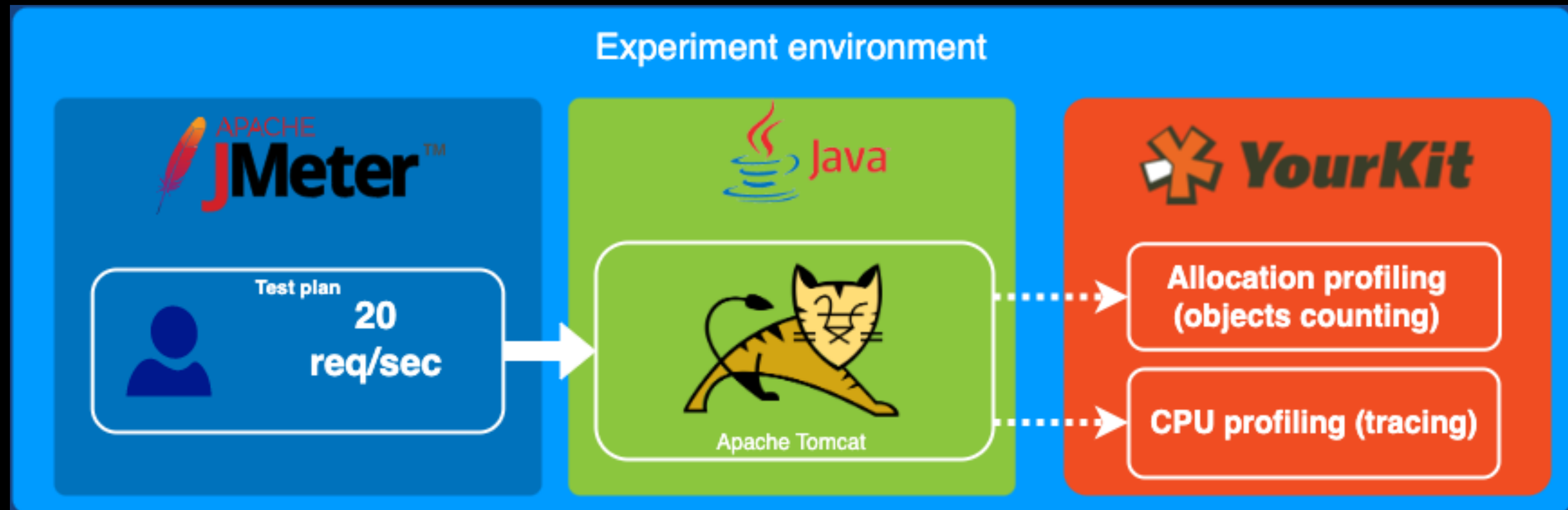CPU: Intel(R) Core(TM) i7-9750H CPU @ 2.60GHz

RAM: 16 GB

OS: "mac os x", version: "12.5", arch: "x86_64", family: "mac"

Java: Azul Zulu JDK 11.50.19 (11.0.12), 64-bit

Experiment
Tools

- Apache JMeter https://jmeter.apache.org

- YourKit Profiler https://www.yourkit.com

Experiment
How to count static/instance methods?

- StackOverflow question: *"How to differentiate between static and instance methods using YourKit Java Profiler?"* - https://stackoverflow.com/questions/76307975/how-to-differentiate-between-static-and-instance-methods-using-yourkit-java-prof   *0 answers*

- *YourKit Forum: "How to differentiate between static and instance methods using YourKit Java Profiler?" -* https://www.yourkit.com/forum/viewtopic.php?t=44185
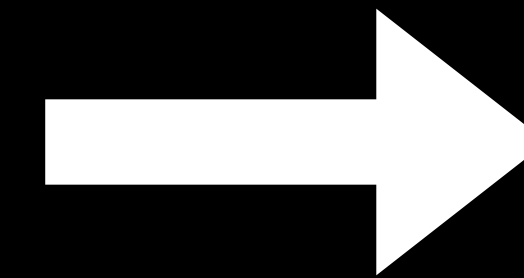
"Dear Volodya,

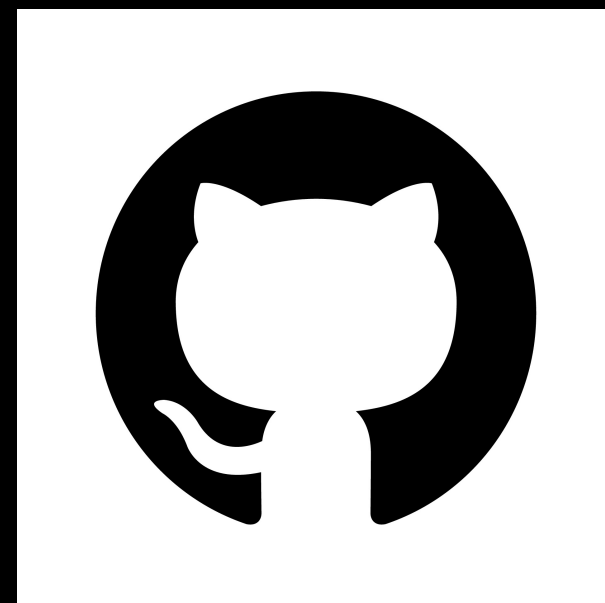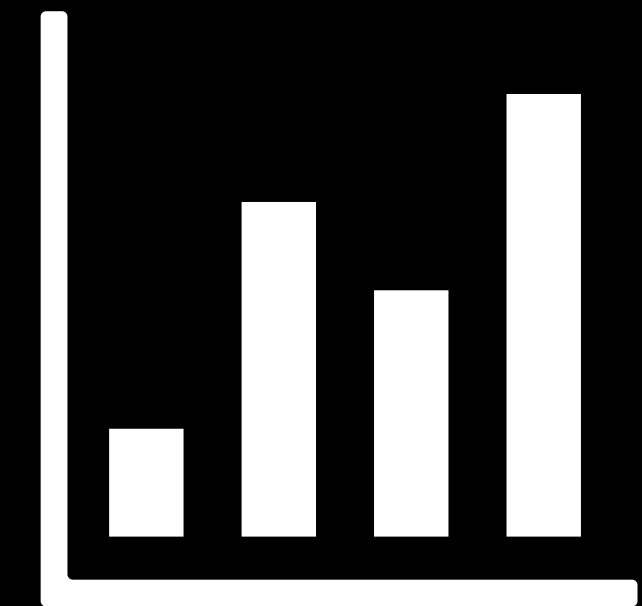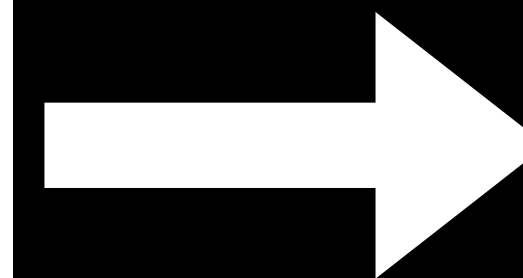The profiler does not mark static methods in any way. "
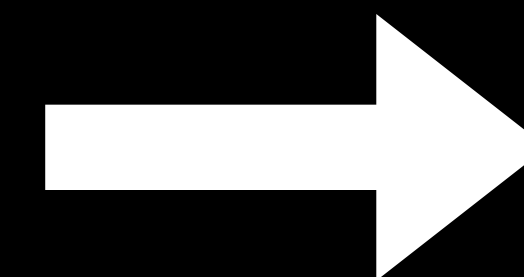
Experiment
Tools
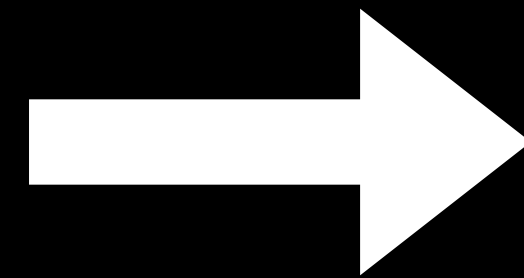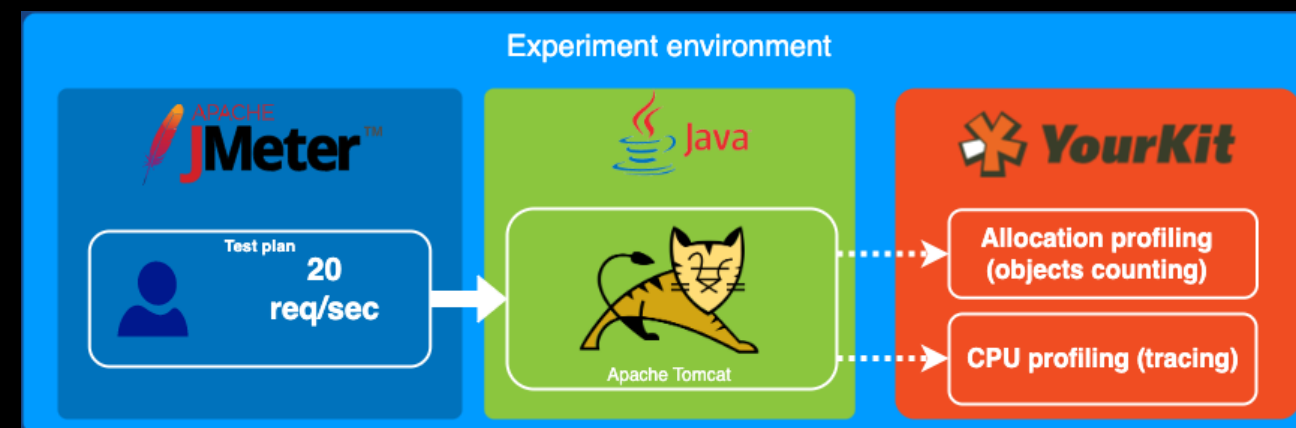
org.apache.derby
org.apache.tomcat
kafka
org.springframework
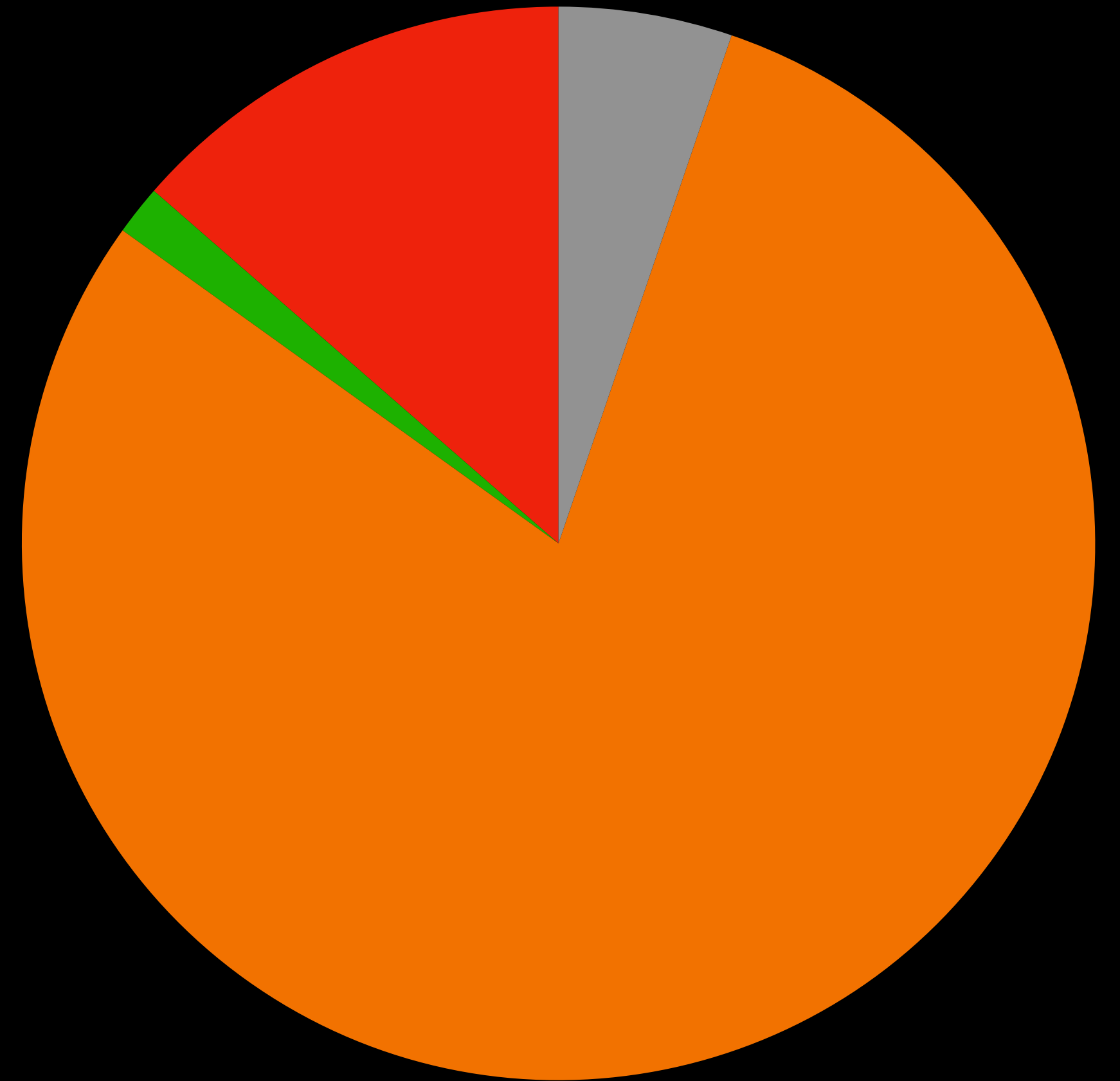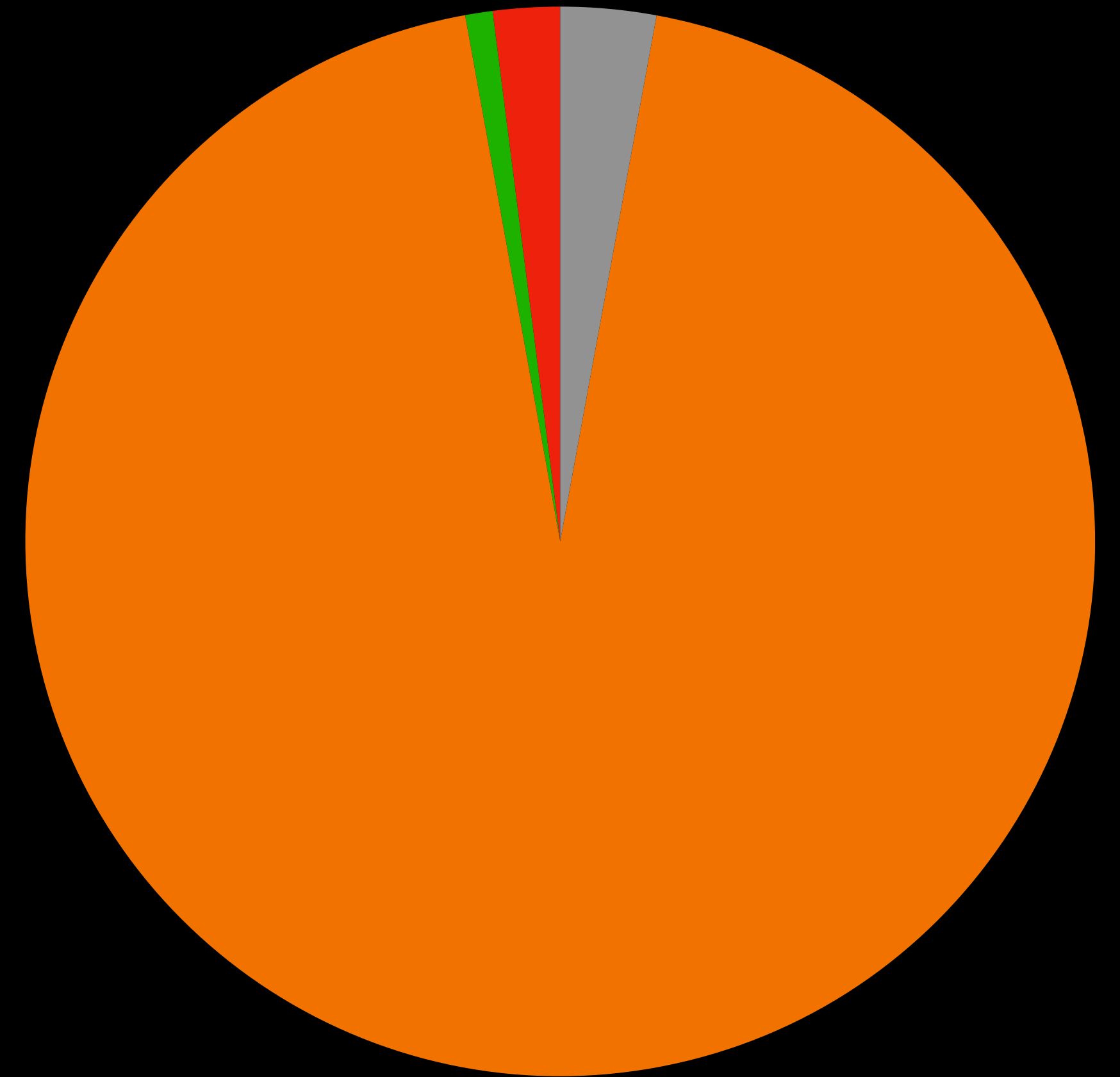org.takes
...

CSV
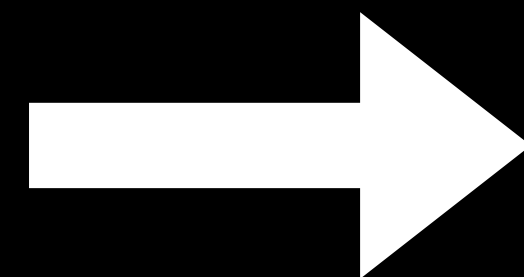
Sources

Apache Tomcat

- Total: 697025

- Constructors: 10432 - 1%

- Instance methods: 555410 - 80%

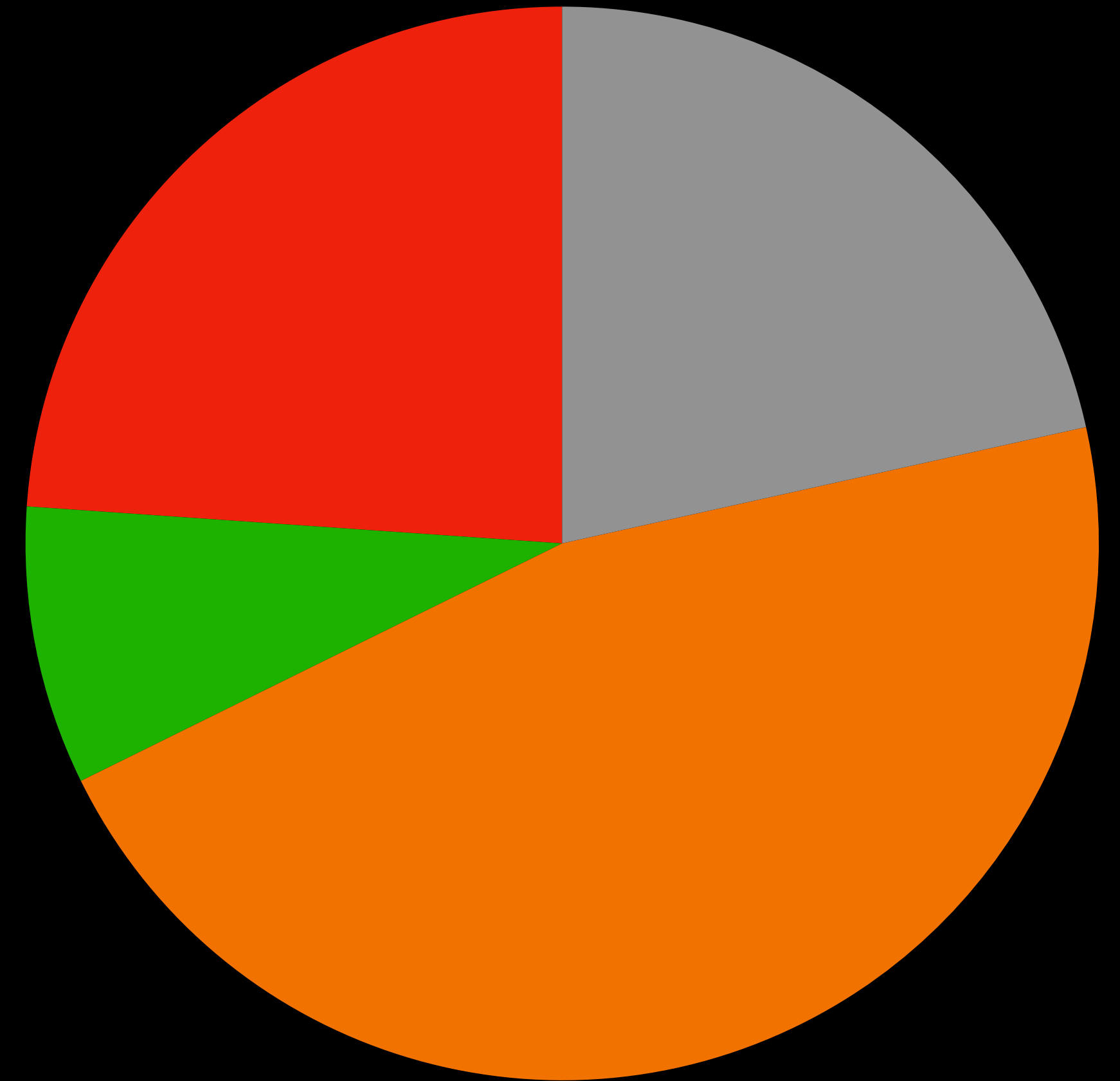- Static methods: 36436 - 5%

- Not found methods: 94747 - 14%

Apache Derby

- Total: 56138367

- Constructors: 464090 - 1%

- Instance methods: 52920211 - 94%

- Static methods: 1620495 - 3%

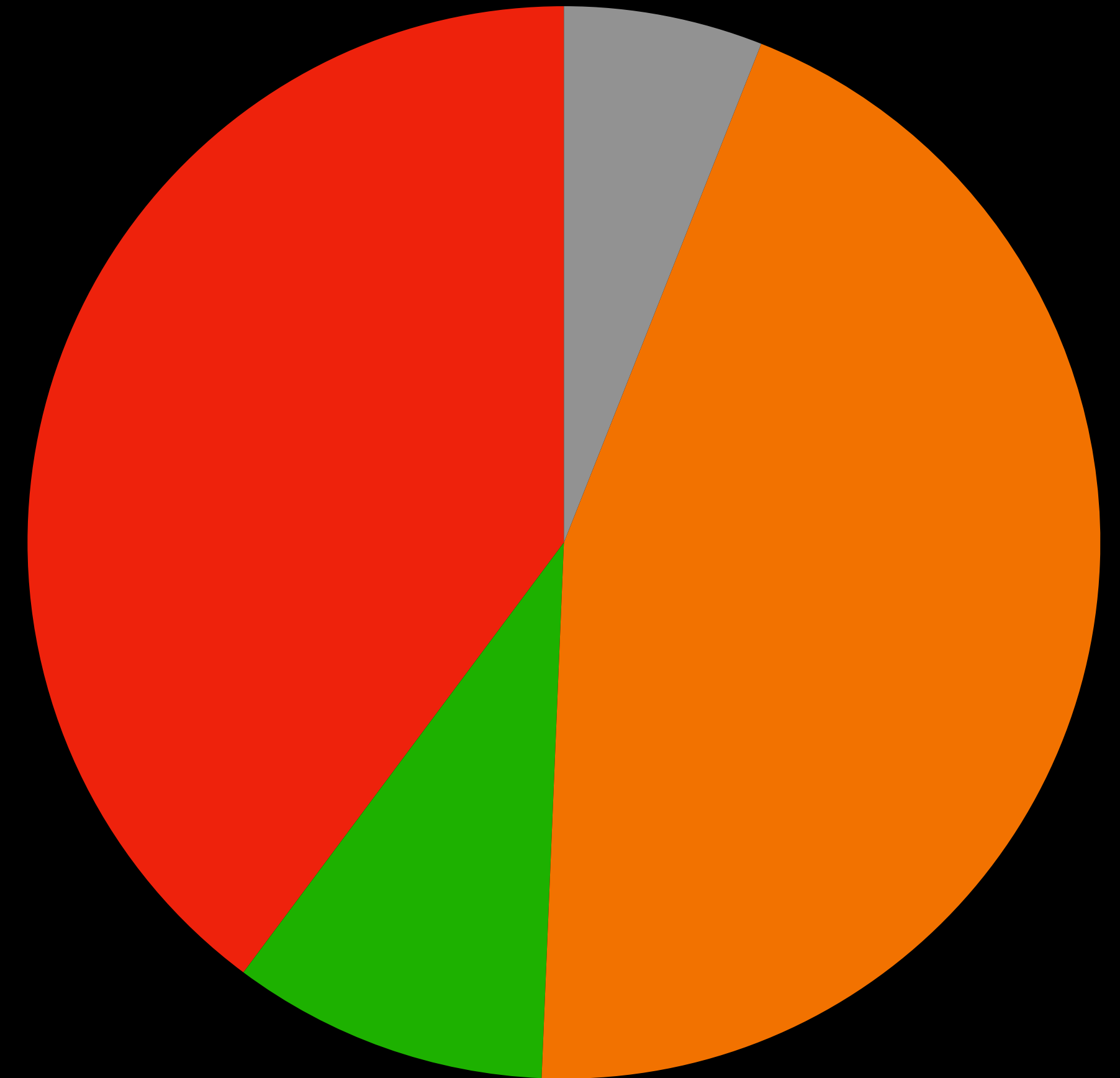- Not found methods: 1133571 - 2%

Spring MVC

- Total: 1045850

- Constructors: 87796 - 8%

- Instance methods: 483003 - 46%

- Static methods: 225081 - 22%
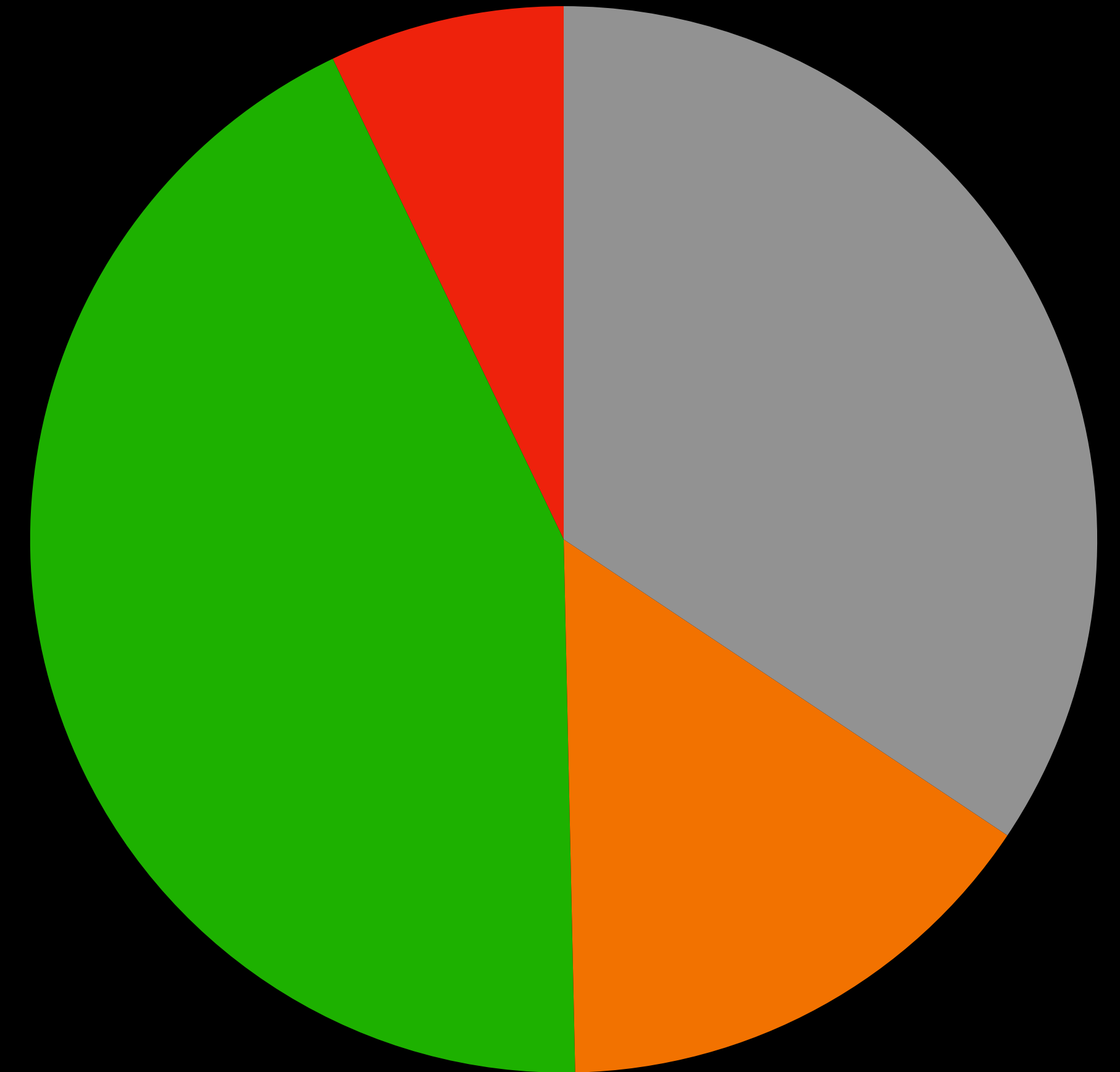
- Not found methods: 249970 - 24%

Apache Kafka

- Total: 1810372

- Constructors: 172526 - 10%

- Instance methods: 808657 - 45%

- Static methods: 108538 - 5%

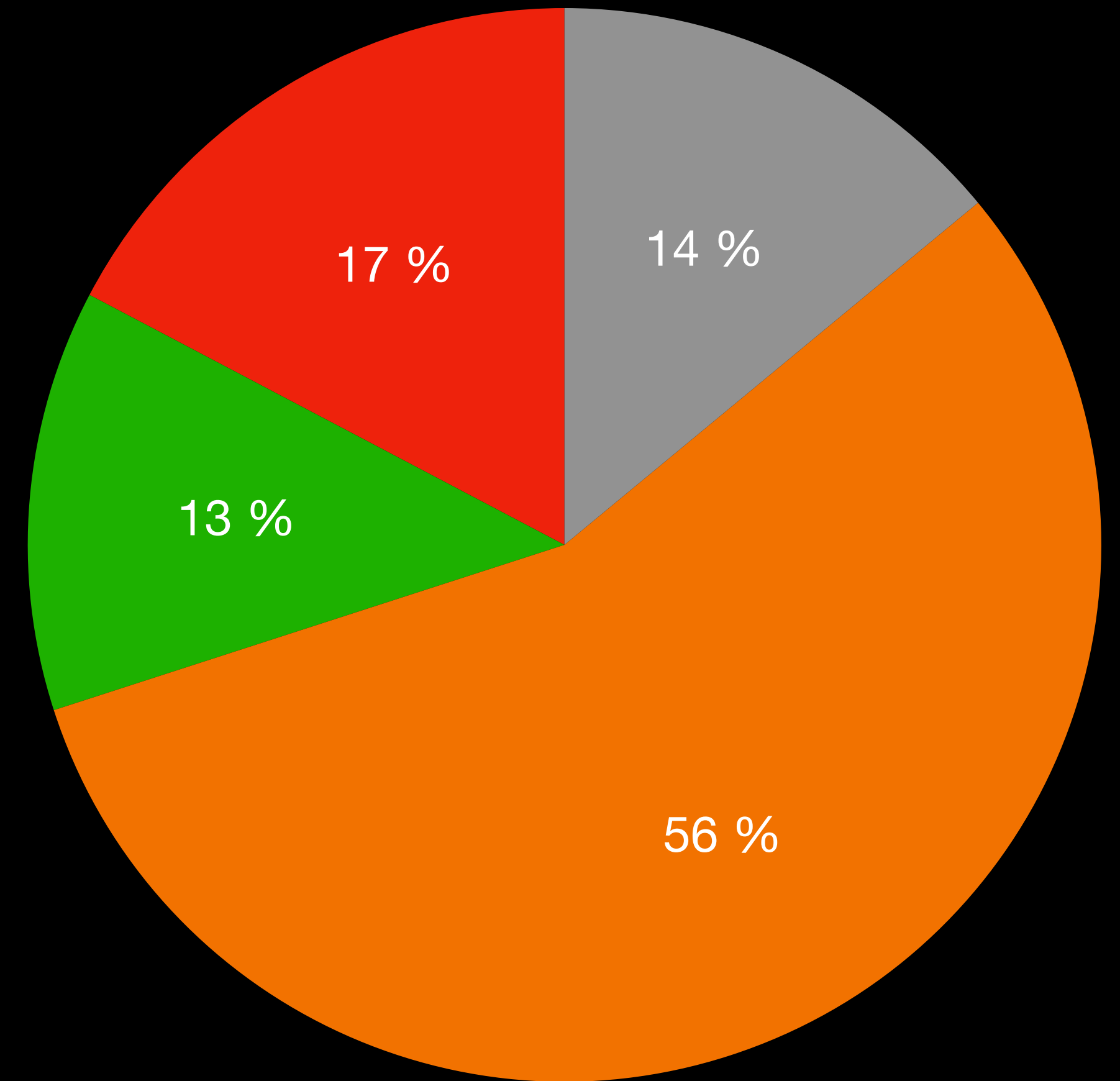- Not found methods: 720651 - 40% (Scala)

Takes

- Total: 47851

- Constructors: 20680 - 43%

- Instance methods: 7316 - 15%

- Static methods: 16445 - 35%

- Not found methods: 3410 - 7%
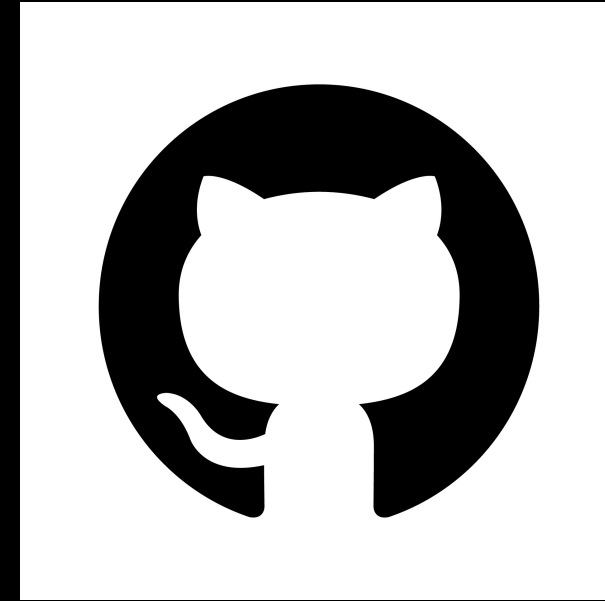
Total

- Total: 100%

- Constructors: 13%

- Instance methods: 56%

- Static methods: 14%

- Not found methods: 17%

What is next?

- Decrease number of Not found methods

- Try to write our own statistics agent

- Divide Instance methods (on interface methods, single instance methods and several instance methods)

- Paper

https://github.com/volodya-lombrozo/cost-of-oop

https://github.com/volodya-lombrozo/oop-statistics-filter