Static Code Analysis Findings

SonarQube analysis was done before and after refactoring the codebase. Screenshots were taken of the overview, issues and measures.

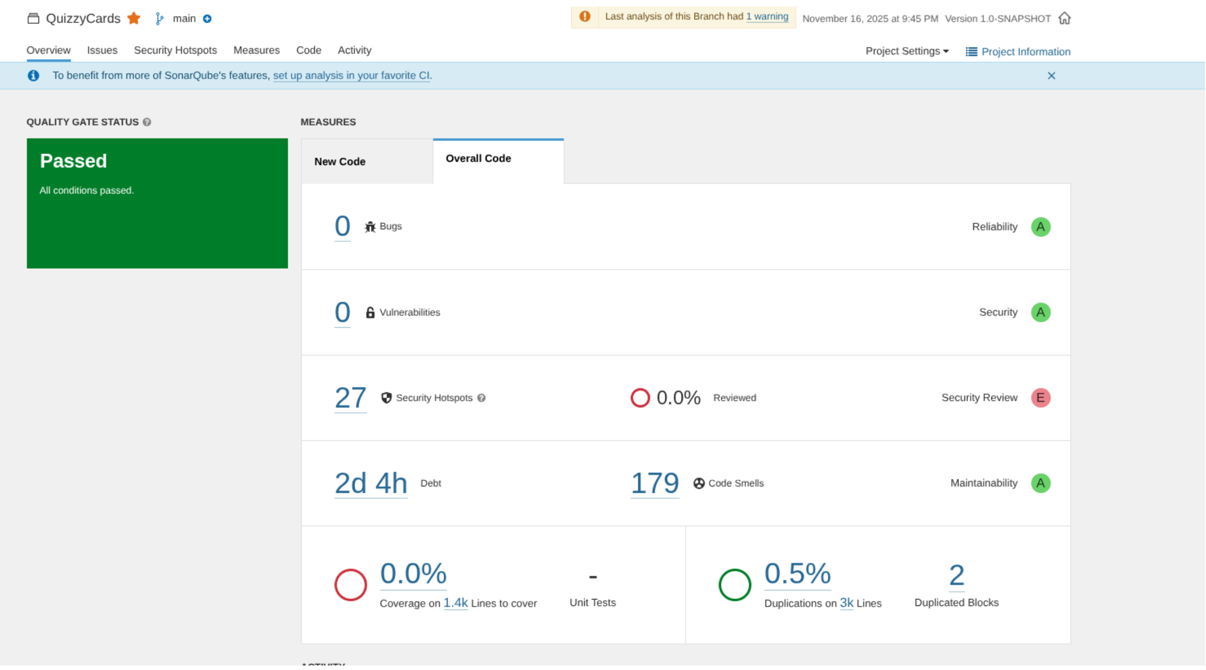
Measures before refactoring:

- 179 issues
- 410 cyclomatic complexity
- 11 lines of code per method
- 19 duplicated lines

11 lines of code per method is a very good number and cyclomatic complexity is good too. If total cyclomatic complexity is divided by total number of functions (269) to get the average cyclomatic complexity the result is 1.53, which is excellent.

So the biggest improvements that can be made is reducing the number of issues as much as possible without restructuring the codebase too much.

Screenshots before refactoring:



Last analysis of this Branch had 1 warning

November 16, 2025 at 9:45 PM Version 1.0-SNAPSHOT

To benefit from more of SonarQube's features, set up analysis in your favorite CI.

QUALITY GATE STATUS

Passed

All conditions passed.

MEASURES

0 Bugs — Reliability A

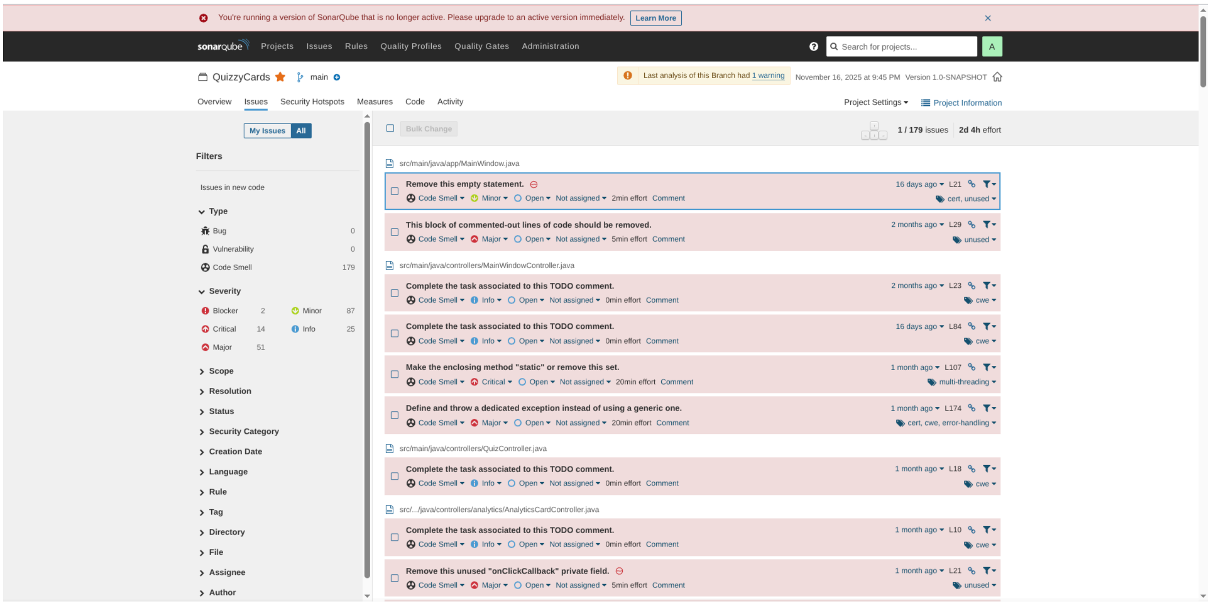
0 Vulnerabilities — Security A

27 Security Hotspots — 0.0% Reviewed — Security Review E

2d 4h Debt — 179 Code Smells — Maintainability A

0.0% Coverage on 1.4k Lines to cover — - Unit Tests

0.5% Duplications on 3k Lines — 2 Duplicated Blocks



You're running a version of SonarQube that is no longer active. Please upgrade to an active version immediately. Learn More ×

QuizzyCards main

Last analysis of this Branch had 1 warning November 16, 2025 at 9:45 PM Version 1.0-SNAPSHOT

1 / 179 issues 2d 4h effort

Filters

Issues in new code

Type	
Bug	0
Vulnerability	0
Code Smell	179

Severity			
Blocker	2	Minor	87
Critical	14	Info	25
Major	51		

src/main/java/app/MainWindow.java

□ Remove this empty statement. — Code Smell ▾ Minor ▾ Open ▾ Not assigned ▾ 2min effort Comment — 16 days ago ▾ L21 — cert, unused ▾

□ This block of commented-out lines of code should be removed. — Code Smell ▾ Major ▾ Open ▾ Not assigned ▾ 5min effort Comment — 2 months ago ▾ L29 — unused ▾

src/main/java/controllers/MainWindowController.java

□ Complete the task associated to this TODO comment. — Code Smell ▾ Info ▾ Open ▾ Not assigned ▾ 0min effort Comment — 2 months ago ▾ L23 — cwe ▾

□ Complete the task associated to this TODO comment. — Code Smell ▾ Info ▾ Open ▾ Not assigned ▾ 0min effort Comment — 16 days ago ▾ L84 — cwe ▾

□ Make the enclosing method "static" or remove this set. — Code Smell ▾ Critical ▾ Open ▾ Not assigned ▾ 20min effort Comment — 1 month ago ▾ L107 — multi-threading ▾

□ Define and throw a dedicated exception instead of using a generic one. — Code Smell ▾ Major ▾ Open ▾ Not assigned ▾ 20min effort Comment — 1 month ago ▾ L174 — cert, cwe, error-handling ▾

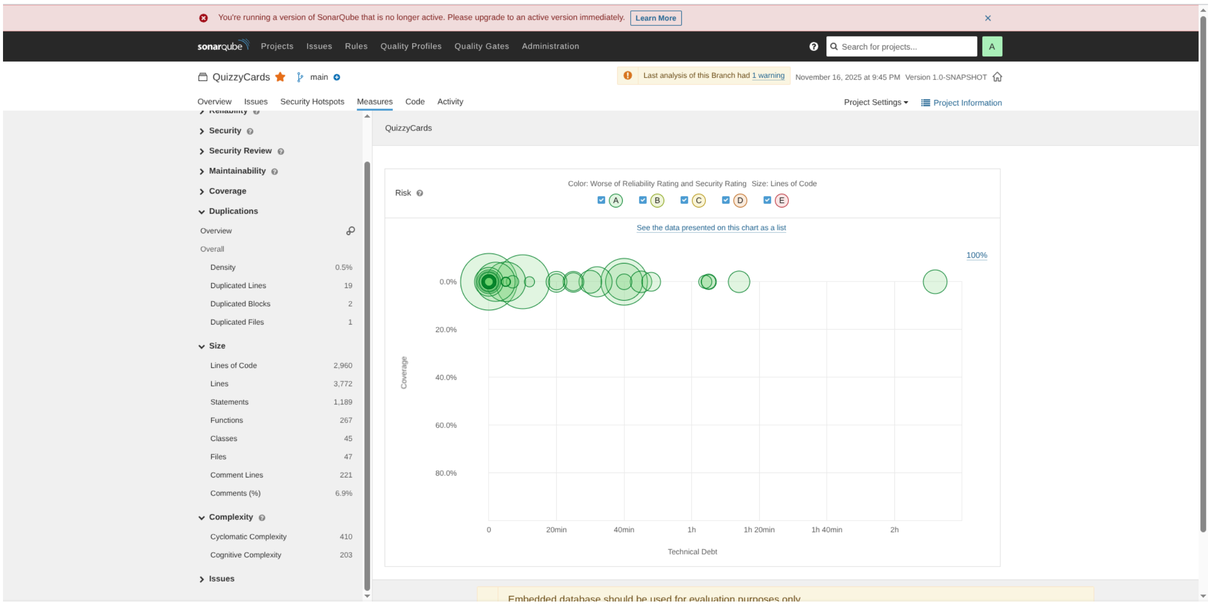
src/main/java/controllers/QuizController.java

□ Complete the task associated to this TODO comment. — Code Smell ▾ Info ▾ Open ▾ Not assigned ▾ 0min effort Comment — 1 month ago ▾ L18 — cwe ▾

src/.../java/controllers/analytics/AnalyticsCardController.java

□ Complete the task associated to this TODO comment. — Code Smell ▾ Info ▾ Open ▾ Not assigned ▾ 0min effort Comment — 1 month ago ▾ L10 — cwe ▾

□ Remove this unused "onClickCallback" private field. — Code Smell ▾ Major ▾ Open ▾ Not assigned ▾ 5min effort Comment — 1 month ago ▾ L21 — unused ▾



You're running a version of SonarQube that is no longer active. Please upgrade to an active version immediately. Learn More ×

QuizzyCards main

Last analysis of this Branch had 1 warning November 16, 2025 at 9:45 PM Version 1.0-SNAPSHOT

Duplications

Overview

Overall

Density	0.5%
Duplicated Lines	19
Duplicated Blocks	2
Duplicated Files	1

Size

Lines of Code	2,960
Lines	3,772
Statements	1,189
Functions	267
Classes	45
Files	47
Comment Lines	221
Comments (%)	6.9%

Complexity

Cyclomatic Complexity	410
Cognitive Complexity	203

Issues
QuizzyCards
Risk
Color: Worse of Reliability Rating and Security Rating Size: Lines of Code
A
B
C
D
E
See the data presented on this chart as a list
100%
0.0%
20.0%
40.0%
60.0%
80.0%
Coverage
0
20min
40min
1h
1h 20min
1h 40min
2h
Technical Debt

Embedded database should be used for evaluation purposes only

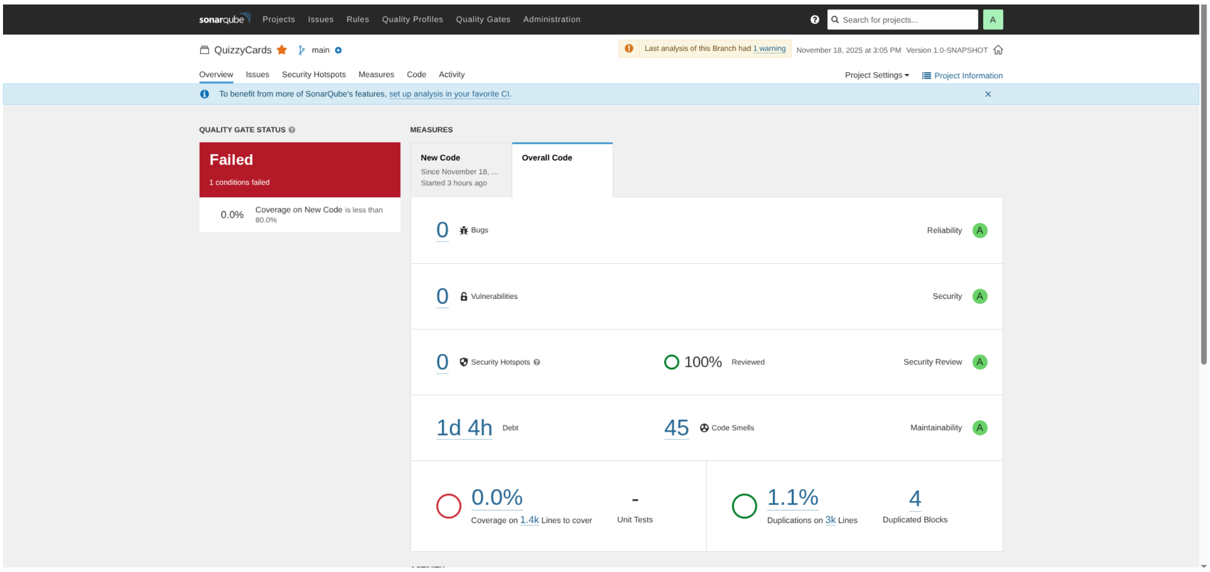
Measures after refactoring:

- 45 issues
- 411 cyclomatic complexity
- 11 lines of code per method
- 42 duplicated lines

By refactoring the codebase, we removed 134 issues. Some issues remain, but they are not critical issues.

Duplicated lines increased after refactoring. The overall duplication for the project is still under 3%, which is generally considered good, so we won't try to fix that.

After refactoring (failed due to sonarqube incorrectly thinking coverage is 0, JaCoCo works):



QuizzyCards ★ main

Last analysis of this Branch had 1 warning November 18, 2025 at 3:05 PM Version 1.0-SNAPSHOT

To benefit from more of SonarQube's features, set up analysis in your favorite CI.

QUALITY GATE STATUS

Failed

1 conditions failed

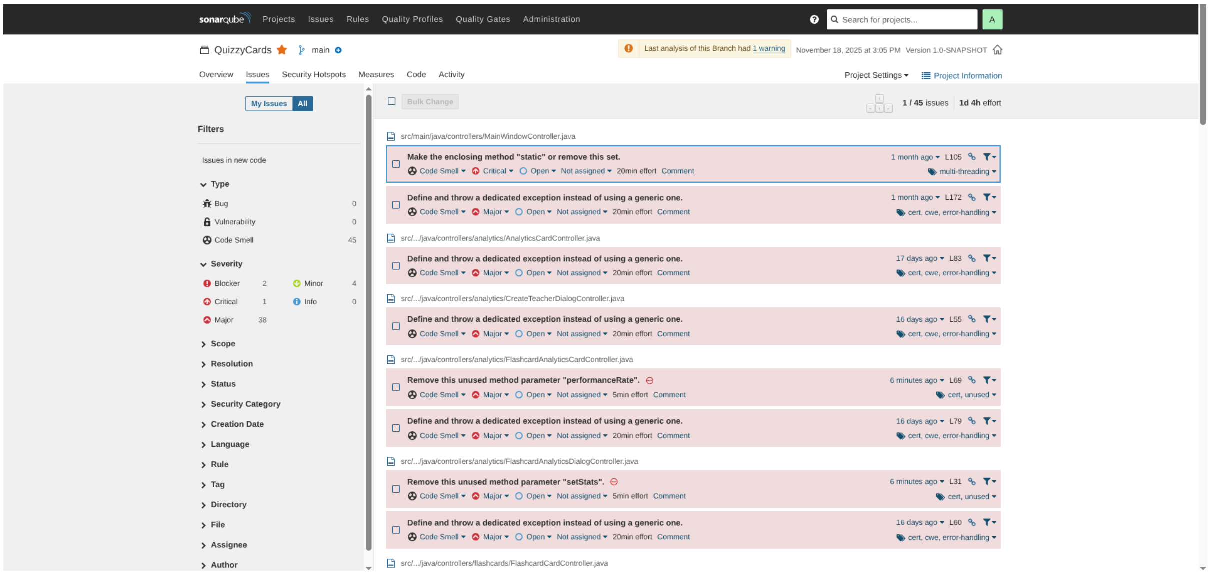
0.0% Coverage on New Code is less than 80.0%

MEASURES

New Code Since November 18, ... Started 3 hours ago	Overall Code

0 Bugs		Reliability A
0 Vulnerabilities		Security A
0 Security Hotspots	100% Reviewed	Security Review A
1d 4h Debt	45 Code Smells	Maintainability A

0.0% Coverage on 1.4k Lines to cover	- Unit Tests	1.1% Duplications on 3k Lines	4 Duplicated Blocks



QuizzyCards ★ main

Last analysis of this Branch had 1 warning November 18, 2025 at 3:05 PM Version 1.0-SNAPSHOT

Filters

Issues in new code

Type

Bug	0
Vulnerability	0
Code Smell	45

Severity

Blocker	2	Minor	4
Critical	1	Info	0
Major	38		

Scope

Resolution

Status

Security Category

Creation Date

Language

Rule

Tag

Directory

File

Assignee

Author

1 / 45 issues 1d 4h effort

src/main/java/controllers/MainWindowController.java

- **Make the enclosing method "static" or remove this set.** 1 month ago L105
  Code Smell Critical Open Not assigned 20min effort Comment multi-threading
- **Define and throw a dedicated exception instead of using a generic one.** 1 month ago L172
  Code Smell Major Open Not assigned 20min effort Comment cert, cwe, error-handling

src/.../java/controllers/analytics/AnalyticsCardController.java

- **Define and throw a dedicated exception instead of using a generic one.** 17 days ago L83
  Code Smell Major Open Not assigned 20min effort Comment cert, cwe, error-handling

src/.../java/controllers/analytics/CreateTeacherDialogController.java

- **Define and throw a dedicated exception instead of using a generic one.** 16 days ago L55
  Code Smell Major Open Not assigned 20min effort Comment cert, cwe, error-handling

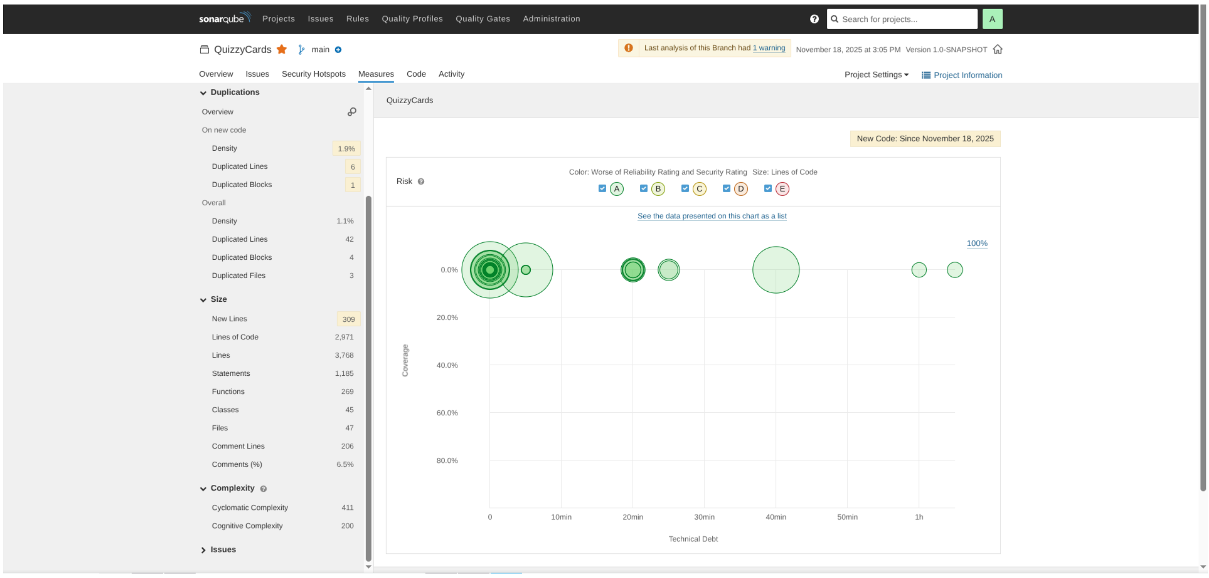
src/.../java/controllers/analytics/FlashcardAnalyticsCardController.java

- **Remove this unused method parameter "performanceRate".** 6 minutes ago L69
  Code Smell Major Open Not assigned 5min effort Comment cert, unused
- **Define and throw a dedicated exception instead of using a generic one.** 16 days ago L79
  Code Smell Major Open Not assigned 20min effort Comment cert, cwe, error-handling

src/.../java/controllers/analytics/FlashcardAnalyticsDialogController.java

- **Remove this unused method parameter "setStats".** 6 minutes ago L31
  Code Smell Major Open Not assigned 5min effort Comment cert, unused
- **Define and throw a dedicated exception instead of using a generic one.** 16 days ago L60
  Code Smell Major Open Not assigned 20min effort Comment cert, cwe, error-handling

src/.../java/controllers/flashcards/FlashcardCardController.java



QuizzyCards ★ main

Last analysis of this Branch had 1 warning November 18, 2025 at 3:05 PM Version 1.0-SNAPSHOT

Duplications

Overview	
On new code	
Density	1.9%
Duplicated Lines	6
Duplicated Blocks	1
Overall	
Density	1.1%
Duplicated Lines	42
Duplicated Blocks	4
Duplicated Files	3

Size

New Lines	309
Lines of Code	2,971
Lines	3,768
Statements	1,185
Functions	269
Classes	45
Files	47
Comment Lines	206
Comments (%)	6.5%

Complexity

Cyclomatic Complexity	411
Cognitive Complexity	200

Issues

QuizzyCards

New Code: Since November 18, 2025

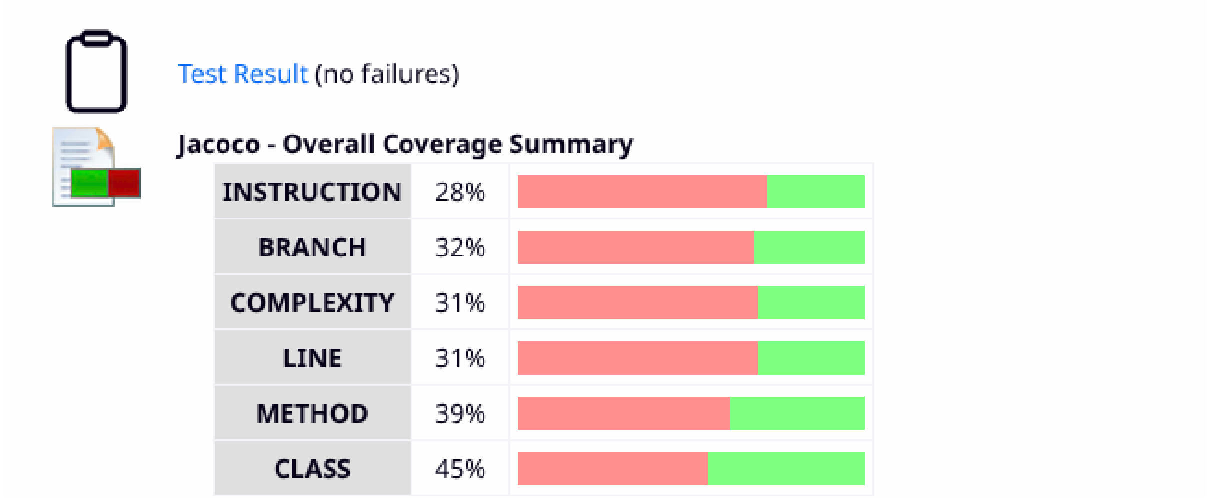
Risk

Color: Worse of Reliability Rating and Security Rating Size: Lines of Code

☑ A ☑ B ☑ C ☑ D ☑ E

See the data presented on this chart as a list

Code coverage that is not shown on sonarqube:



Test Result (no failures)

Jacoco - Overall Coverage Summary

INSTRUCTION	28%
BRANCH	32%
COMPLEXITY	31%
LINE	31%
METHOD	39%
CLASS	45%

Could be a lot better, but the whole backend has over 90% coverage, frontend has no coverage. Due to this, the results are skewed.