

Five classes with mutation score lower than 70%, that were improved:

- LectureService (nl.tudelft.unischeduler.database.lecture)
- RulesModule (nl.tudelft.unischeduler.rules.core)
- Generator (nl.tudelft.unischeduler.schedulegenerate.generator)
- Course (nl.tudelft.unischeduler.schedulegenerate.entities.course)
- Lecture (nl.tudelft.unischeduler.schedulegenerate.entities.lecture)

notes:

- We were actually going to pick either one of the course and lecture entities from the schedule-generate module, but all the other entities of the module had a mutation score over 70% already. We wanted to fix both while we were at it and this increased the number of improved classes to 5.
- Added as argument to the constructor of the generator a custom class (DateTimeImpl) that instantiates Date and Calendar objects so we can mock the current time (one mutant needed this for it to be killed).
- A couple of mutants were simply testing print statements which were forgotten there a long time ago, therefore not supposed to be there, so we removed those.
- Added attribute "util" to Generator class and made all the Util methods non-static and added an empty constructor so we can mock it while testing Generator.
- In method schedulingLecture(), there was a mutant that checks for the return value of the method, however following the functionality of our code this return will always be true, therefore the mutant is equivalent to our code's functionality.

LectureService

Commits [4918be31](#)

before:

Package Summary

nl.tudelft.unischeduler.database.lecture

| Number of Classes | Line Coverage | Mutation Coverage |
|-------------------|-------------------------------------|------------------------------------|
| 2 | 68% <div><div>85/125</div></div> | 26% <div><div>20/76</div></div> |

Breakdown by Class

| Name | Line Coverage | Mutation Coverage |
|----------------------------------------|-------------------------------------|------------------------------------|
| LectureController.java | 91% <div><div>10/11</div></div> | 10% <div><div>1/10</div></div> |
| LectureService.java | 66% <div><div>75/114</div></div> | 29% <div><div>19/66</div></div> |

after:

Package Summary

nl.tudelft.unischeduler.database.lecture

| Number of Classes | Line Coverage | Mutation Coverage |
|-------------------|--------------------------------------|------------------------------------|
| 2 | 85% <div><div>112/131</div></div> | 54% <div><div>43/79</div></div> |

Breakdown by Class

| Name | Line Coverage | Mutation Coverage |
|----------------------------------------|--------------------------------------|------------------------------------|
| LectureController.java | 91% <div><div>10/11</div></div> | 10% <div><div>1/10</div></div> |
| LectureService.java | 85% <div><div>102/120</div></div> | 61% <div><div>42/69</div></div> |

RulesModule

[10d3d00f](#)

before:

Pit Test Coverage Report

Package Summary

nl.tudelft.unischeduler.rules.core

| Number of Classes | | Line Coverage | | Mutation Coverage |
|-------------------|-----|-----------------------------|-----|-----------------------------|
| 1 | 61% | <div><div>38/62</div></div> | 69% | <div><div>40/58</div></div> |

Breakdown by Class

| Name | | Line Coverage | | Mutation Coverage |
|----------------------------------|-----|-----------------------------|------------|-----------------------------|
| RulesModule.java | 61% | <div><div>38/62</div></div> | <u>69%</u> | <div><div>40/58</div></div> |

after:

Pit Test Coverage Report

Package Summary

nl.tudelft.unischeduler.rules.core

| Number of Classes | | Line Coverage | | Mutation Coverage |
|-------------------|-----|-----------------------------|-----|-----------------------------|
| 1 | 94% | <div><div>58/62</div></div> | 91% | <div><div>53/58</div></div> |

Breakdown by Class

| Name | | Line Coverage | | Mutation Coverage |
|----------------------------------|-----|-----------------------------|------------|-----------------------------|
| RulesModule.java | 94% | <div><div>58/62</div></div> | <u>91%</u> | <div><div>53/58</div></div> |

Generator

Commits: [14019f06](#) [0fa120f8](#) or merge request [811763a0](#)

before:

Package Summary

nl.tudelft.unischeduler.schedulegenerate.generator

| Number of Classes | | Line Coverage | | Mutation Coverage |
|-------------------|-----|-------------------------------|-----|-----------------------------|
| 1 | 95% | <div><div>118/124</div></div> | 68% | <div><div>49/72</div></div> |

Breakdown by Class

| Name | | Line Coverage | | Mutation Coverage |
|--------------------------------|-----|-------------------------------|------------|-----------------------------|
| Generator.java | 95% | <div><div>118/124</div></div> | <u>68%</u> | <div><div>49/72</div></div> |

after:

Package Summary

nl.tudelft.unischeduler.schedulegenerate.generator

| Number of Classes | | Line Coverage | | Mutation Coverage |
|-------------------|------|-------------------------------|-----|-----------------------------|
| 1 | 100% | <div><div>126/126</div></div> | 99% | <div><div>69/70</div></div> |

Breakdown by Class

| Name | | Line Coverage | | Mutation Coverage |
|--------------------------------|------|-------------------------------|------------|-----------------------------|
| Generator.java | 100% | <div><div>126/126</div></div> | <u>99%</u> | <div><div>69/70</div></div> |

ScheduleGenerate entities:

Merge commit: [2dbaee37](#)

Before:

Pit Test Coverage Report

Package Summary

nl.tudelft.unischeduler.schedulegenerate.entities

| Number of Classes | Line Coverage | Mutation Coverage |
|-------------------|----------------|-------------------|
| 5 | 80% 187/235 | 68% 86/127 |

Breakdown by Class

| Name | Line Coverage | Mutation Coverage |
|------------------------------|---------------|-------------------|
| Course.java | 47% 16/34 | 25% 3/12 |
| Lecture.java | 67% 30/45 | 46% 6/13 |
| Room.java | 75% 18/24 | 86% 12/14 |
| Student.java | 97% 29/30 | 77% 10/13 |
| Util.java | 92% 94/102 | 73% 55/75 |

After:

Package Summary

nl.tudelft.unischeduler.schedulegenerate.entities

| Number of Classes | Line Coverage | Mutation Coverage |
|-------------------|----------------|-------------------|
| 5 | 85% 200/235 | 78% 99/127 |

Breakdown by Class

| Name | Line Coverage | Mutation Coverage |
|------------------------------|---------------|-------------------|
| Course.java | 65% 22/34 | 83% 10/12 |
| Lecture.java | 82% 37/45 | 92% 12/13 |
| Room.java | 75% 18/24 | 86% 12/14 |
| Student.java | 97% 29/30 | 77% 10/13 |
| Util.java | 92% 94/102 | 73% 55/75 |