

Exercise_03

Ramona Walker, Dominik Johann Arnold, Mark Woolley, Otto Buck

November 2022

Notes regarding testing

- **JUnit Version:**

Since we ran into problems with running the jupyter JUnit Version higher than 5.8+, we decided to use JUnit 5.8.2.

- **Branch coverage and assert statements::**

We realized that the branch coverage in our JUnit setup is negatively affected by assert statements in methods as used by Design by Contract. Even though the assert statement is covered by tests, it is always marked as "partially covered". See 2 for an example from class Tableau, where branch coverage is low (66%), although all lines are covered by tests.

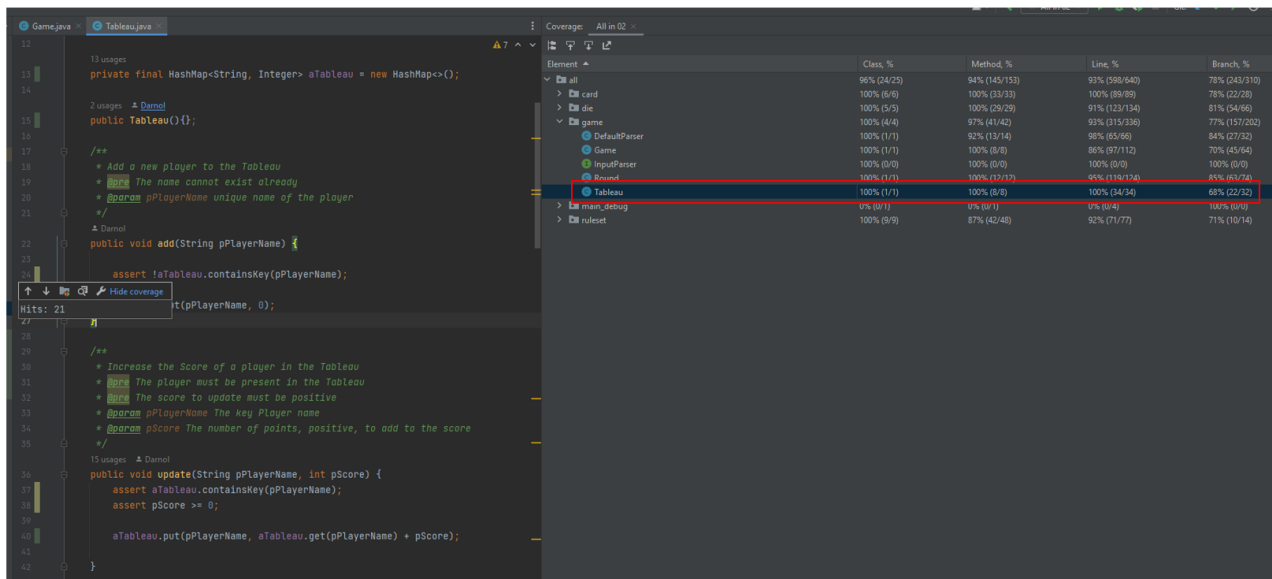
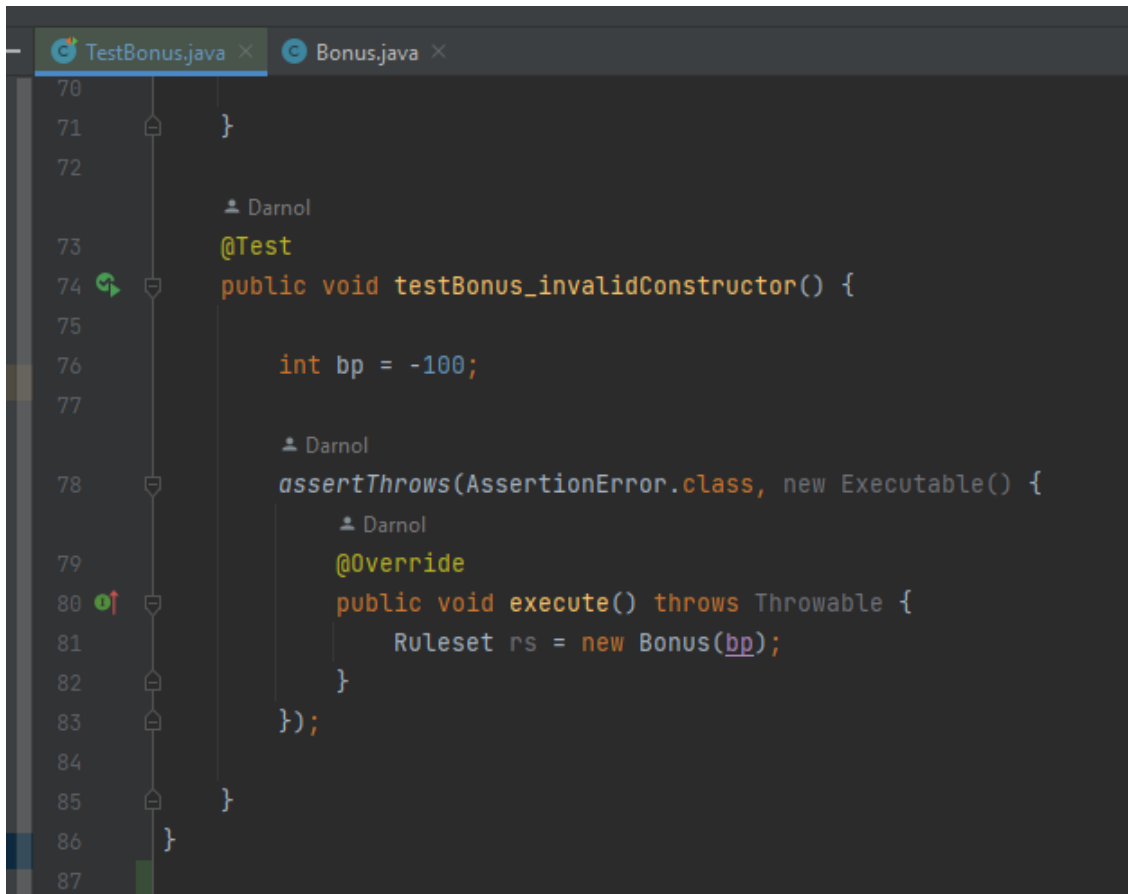


Figure 1: Example branch coverage in class Tableau

We tried to cover the assert statements by adding explicit tests checking that an assertion is indeed thrown. This helps the branch coverage a little bit, but does not lead to fully covered flags for the lines with assert. See ?? for an example from the tests of the Bonus Ruleset. We didn't include those tests extensively, because it is very time consuming, clutters our test code and, most importantly, is not advised by the book. In our understanding, assert statements do not have to be covered by tests, because you expect them to fail if the input is invalid.



```
70
71 }
72
73   Darnol
74   @Test
75   public void testBonus_invalidConstructor() {
76
77       int bp = -100;
78
79       Darnol
80       assertThrows(AssertionError.class, new Executable() {
81           Darnol
82           @Override
83           public void execute() throws Throwable {
84               Ruleset rs = new Bonus(bp);
85           }
86       });
87 }
```

Figure 2: Example test which tests for AssertionError

Overall, we still reached the 70% branch coverage, but the branch coverage could be much higher.