



Mutációs tesztelés



Mi is a mutációs tesztelés?

- Belenyúlunk a kódunkba
- Felismerik-e a tesztek?



Részei

- Mutation Generation
- Running Tests
- Mutation Analysis



Kategóriája és célja

- White Box tesztelés
- Célja -> tesztek minősége



Kategóriája és célja

- White Box tesztelés
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Javában

-PITesting
-Jester

Javában

Pit Test Coverage Report

Project Summary

Number of Classes	Line Coverage	Mutation Coverage
1	100% 	90% 

Breakdown by Package

Name	Number of Classes	Line Coverage	Mutation Coverage
service 1		100% 	90% 

Report generated by [PIT](#) 1.5.2

Javában

Service.java

```
1 package service;
2
3 public class Service {
4     public int add(int a, int b) {
5         21 if (a < 2) {
6         46     return (a + b) * -2 + 1;
7         } else {
8         19     return a + b;
9         }
10    }
```

```
1. Replaced integer addition with subtraction → KILLED
2. replaced int return with 0 for service/Service::add → KILLED
3. replaced return of integer sized value with (x == 0 ? 1 : 0) → KILLED
4. Negated integer local variable number 1 → KILLED
5. Negated integer local variable number 2 → KILLED
6. Replaced integer operation with first member → KILLED
7. Replaced integer operation by second member → KILLED
8. Replaced integer addition with subtraction → KILLED
9. Replaced integer addition with multiplication → KILLED
10. Replaced integer addition with division → KILLED
11. Replaced integer addition with modulus → KILLED
12. Incremented (a++) integer local variable number 1 → SURVIVED
13. Incremented (a++) integer local variable number 2 → SURVIVED
14. Decrementd (a--) integer local variable number 1 → SURVIVED
15. Decrementd (a--) integer local variable number 2 → SURVIVED
16. Incremented (++a) integer local variable number 1 → KILLED
17. Incremented (++a) integer local variable number 2 → KILLED
18. Decrementd (--a) integer local variable number 1 → KILLED
19. Decrementd (--a) integer local variable number 2 → KILLED
```


Javában

```
<build>
  <plugins>
    <plugin>
      <groupId>org.pitest</groupId>
      <artifactId>pitest-maven</artifactId>
      <version>1.15.8</version>
    </plugin>
  </plugins>
</build>
```



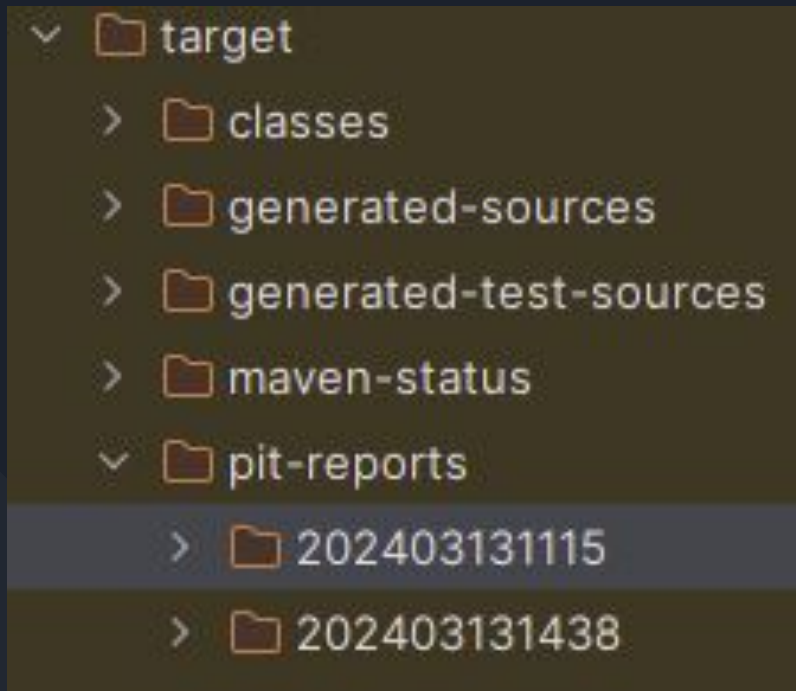
PITest Helper

↓ 68 1.0.0 carmeloquelez



mvn org.pitest:pitest-maven:mutationCoverage


Javában





Javában

Köszönöm a figyelmet!



```
public int power(int base, int  
exponent) {  
    int result = 1;  
    for (int i = 0; i < exponent; i++) {  
        result *= base;  
    }  
    return result;  
}
```

```
@Test  
public void testPower() {  
    assertEquals(8, calculator.power(2, 3));  
}
```