tsDETECT
An Open Source Test Smells Detection Tool

TEST SMELLS

Test code, like production code, is subject to smells

Formally introduced in 2001 with 11 smell types

Inclusion of additional smell types, analysis of their evolution and longevity, and elimination patterns

Tools to detect specific smell types

Studies on traditional Java applications
EXISTING TOOLS

- TestQ by Breugelmans et al. -- visually explore and quantify test smells
- TeCRevis by Koochakzadeh et al. -- visualization of redundant tests
- T-Rex by Neukirchen et al. -- violations of TTCN-3
- TestHound by Greiler et al. -- smells related to test fixtures
- Reichhart et al. -- detection of test smells in Smalltalk
- DTDetector by Zang et al. -- detection of dependent tests
- Bavota et al. -- detect nine types of test smells
- Palomba et al. -- detecting three types of test smells
GOAL

The goal of this work is to provide the community with an open-source, extensible tool for the detection of multiple types of unit test smells.
TSDetect

Open-Source  Test Smells Detection  Standalone Executable

JUnit

Available on GitHub
ARCHITECTURE

1. Production File Detection
2. Project source code
3. Path to unit test files
4. tsDetect results
5. JavaParser

TSDETECT
- Assertion Roulette
- Eager Test
- Empty Test
- Lazy Test
- Redundant Print
- ...

Test Smell Detector Modules
19 DETECTED TEST SMELLS

- Assertion Roulette
- Conditional Test Logic
- Constructor Initialization
- Default Test
- Duplicate Assert
- Eager Test
- Empty Test
- Exception Handling
- General Fixture
- Ignored Test
- Lazy Test
- Magic Number Test
- Mystery Guest
- Redundant Print
- Redundant Assertion
- Resource Optimism
- Sensitive Equality
- Sleepy Test
- Unknown Test
EVALUATION

- F-Scores ranging from **87.8% to 100%**
- Manual Evaluation:
  - 20 infected instances per smell
  - 65 annotated files
  - 39 graduate and undergraduate students

<table>
<thead>
<tr>
<th>Smell Type</th>
<th># instances</th>
<th># detected instances</th>
<th>Precision</th>
<th>Recall</th>
<th>F-Score</th>
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</thead>
<tbody>
<tr>
<td>Assertion Roulette</td>
<td>20</td>
<td>19</td>
<td>100%</td>
<td>90.00%</td>
<td>92.31%</td>
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<td>100%</td>
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<td>Constructor Initialization</td>
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<tr>
<td>Default Test</td>
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<td>100%</td>
<td>100%</td>
<td>100%</td>
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<tr>
<td>Duplicate Assert</td>
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<td>21</td>
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<td>90.00%</td>
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<tr>
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<td>Exception Handling</td>
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<td>100%</td>
<td>95.24%</td>
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<td>100%</td>
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<td>Mystery Guest</td>
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<td>95.00%</td>
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<tr>
<td><strong>Average</strong></td>
<td>–</td>
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<td><strong>96.01%</strong></td>
<td><strong>97.11%</strong></td>
<td><strong>96.50%</strong></td>
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</table>
APPLICABILITY

Practitioners  Researchers  Educators
THANKS!

https://testsmells.github.io