Pytest-Smell: A smell detection tool for Python unit tests

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Pytest-smell is a Python tool for detecting bad written unit tests in Pytest. It's creation was driven by an abundance of similar tools for Java software systems and, implicitly, a lack of such tools for Python applications. It aims to be a portable and easy to install/use tool, and it achieves just that by integrating cross-platform support and no extra dependencies (you don't even need an IDE to run it).

Motivated by the popularity of Agile software development and the importance of unit testing in ensuring code quality, this tool scans a given codebase, identifies all the test case methods that start with 'test_' and shows how many of them are *smelly.* Based on several studies, the author defines a smelly test case as one that falls into at least one out of ten categories of bad written test methods, the most frequently met ones being **Assertion Roulette**, **Magic Number** and **Conditional Logic**.

The tool was validated on three big Python open-source libraries which use Pytest as their testing framework: *Pillow*, *Sanic* and *Flask*. In total, 215 test suites were verified, with approximately 90% of them being smelly as a result. This percentage is compared to other two results from other papers that tested other big projects, one in Python with 84% predicted faulty tests (PyNose) and one in Java with 97.5% predicted smelly test methods (TSDetect).