How To Write Good Tests

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Google Testing On The Toilet

Google is a fairly successful company in the software world. If you haven't heard of them, you should probably google their name.

They have an interesting engineering practice:

> "We write flyers about everything from dependency injection to code coverage, and then regularly plaster the bathrooms all over Google with each episode, almost 500 stalls worldwide."

`https://testing.googleblog.com/2007/01/introducing-testing-on-toilet.html`

Why Should I Write Tests?

Unlike the code that we write for ourselves or for a school assignment, code that we write for INSPIRE is going to be refactored, fixed or expanded.

By writing tests we can ensure that the next programmer that will touch our code will be able to build on top of our understanding of the problem.

In order for this to happen, our tests should be *good*. Let's see what this means.

What Is A Good Test?

A good test maximizes three qualities:

- **Fidelity**: sensitivity to defects in the code under test.
- **Resilience**: indifference to non-breaking changes.
- **Precision**.

`https://testing.googleblog.com/2014/05/testing-on-toilet-effective-testing.html`

Test Behavior, Not Implementation

https://testing.googleblog.com/2013/08/testing-on-toilet-test-behavior-not.html

Prefer Testing Public APIs

https://testing.googleblog.com/2015/01/testing-on-toilet-prefer-testing-public.html

An Example

How would you test this sorting algorithm?

```
def find_minimum(arr):
    result = arr[0]

    for el in arr:
        if el < result:
            result = el

    return result


def selection_sort(arr):
    result = []

    for _ in range(len(arr)):
        minimum = find_minimum(arr)
        result.append(minimum)
        arr.remove(minimum)

    return result
```

Change-Detector Tests Considered Harmful

`https://testing.googleblog.com/2015/01/testing-on-toilet-change-detector-tests.html`

Test Behaviors, Not Methods

https://testing.googleblog.com/2014/04/testing-on-toilet-test-behaviors-not.html

Too Many Tests

`https://testing.googleblog.com/2008/02/in-movie-amadeus-austrian-emperor.html`

Naming Unit Tests Responsibly

https://testing.googleblog.com/2007/02/tott-naming-unit-tests-responsibly.html

Understanding Your Coverage Data

https://testing.googleblog.com/2008/03/tott-understanding-your-coverage-data.html

Test Sizes

Tests come in different sizes:

Feature	**Small**	**Medium**	**Large**
Database	×	✓	✓
Network Access	×	`localhost`	✓
...	...	...	...
File System	`idempotent`	✓	✓

`https://testing.googleblog.com/2010/12/test-sizes.html`