Mutation Testing

- Language: Java
- Level: Intermediate
- Requires: Java 1.8+, Internet
- Recommended: IDE (please), Gradle (just faster)

Objective

100% code coverage, all set and done. Objections? Well, let's have a go at being smarter than the code and **introduce bugs that are not detected**.

In the epic battle between human mind and machine power **it's your turn for victory**. Only to automate stuff and force the machine to fight the battle alone.

Reasoning

How do we know whether our tests are good enough?

One common measure is code coverage, but it has its limits. You can take any test suite providing good coverage, remove all of the assertions, and still have good coverage. However, the resulting test suite will be next to useless.

The only real way to know whether our tests are doing their job is to see what happens when our code breaks.

This is the idea behind mutation testing. We deliberately introduce defects into productive code and then see which tests break as a result. If a real defect is introduced and no test breaks, then we know that our tests are inadequate.

Code

Grab a code base with 100% code coverage, see kata "Easter Egg Hunt". Then start and try to change the code so that the tests don't break albeit the code is erraneous. Rinse and repeat.

- How many defects can you introduce within 30 minutes?
- What kind of defects are these?
- Any more ideas?
- Any ideas how to automate the tedious bits?

Setup

```
git clone https://github.com/goeckeler/katas.git
cd "katas/katas/Easter Egg Hunt"
./gradlew build
```

Good idea?

- Only if your code base is already clean. Ask Sonar :-).
- If you start from scratch …
- If your code is critical.
- Parts that cause havoc if not working.
- Modules that are heavily used by others.
- Your own libraries and frameworks.

References

Description	Source
Summary, pretty good	https://en.wikipedia.org/wiki/Mutation_testing
Automated test tool	http://pitest.org/
Eclipse Integration	https://github.com/philglover/pitclipse
IntelliJ integration	http://plugins.jetbrains.com/plugin/?idea&pluginId=7119