



**Learning Object-Oriented
Programming and Design with TDD**

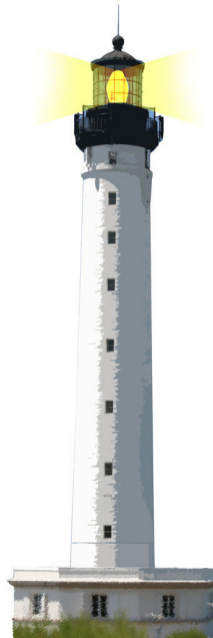
SUnit: Unit Tests in Pharo

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W3S05



Agile Programming

Pharo programming culture adheres to agile programming

- Incremental, early feedback
- Be prepared for changes
- Driven by human
- Supported by automated tests



- Extremely simple (4 classes)
- Originally developed by K. Beck (agile programming father)
- Got copied all over the places



A Test

In a test, we

- Create a context: Create an empty set
- Send a stimulus: Add twice the same element
- Check the results: Check that the set contains only one element



Set TestCase

```
TestCase subclass: # SetTestCase
```

```
...
```

```
SetTestCase >> testAdd
```

```
| empty |
```

```
empty := Set new. "Context"
```

```
empty add: 5. "Stimulus"
```

```
empty add: 5.
```

```
self assert: empty size = 1. "Check"
```

```
SetTestCase run: #testAdd
```



In a Subclass of TestCase

Each method starting with test*:

- Represents a test
- Is automatically executed

The results of the test are collected in a `TestResult` object



Another Example

```
testAdjacentRunsWithEqualsAttributesAreMerged
```

```
"this demonstrates that adjacent runs with equal attributes are merged. "
```

```
| runArray |
```

```
runArray := RunArray new.
```

```
runArray
```

```
  addLast: TextEmphasis normal times: 5;
```

```
  addLast: TextEmphasis bold times: 5;
```

```
  addLast: TextEmphasis bold times: 5.
```

```
self assert: (runArray runs size = 2).
```



Failures and Errors

- A **failure** is a failed assertion, i.e., an anticipated problem that you test
- An **error** is a condition you didn't check for



To Test That an Error Must Be Raised



To Test That an Error Must Not Be Raised

```
SetTestCase >> removeElementNotInSet  
self  
shouldnt: [ Set new add: 1 ]  
raise: NotFound
```

Duplicated Context

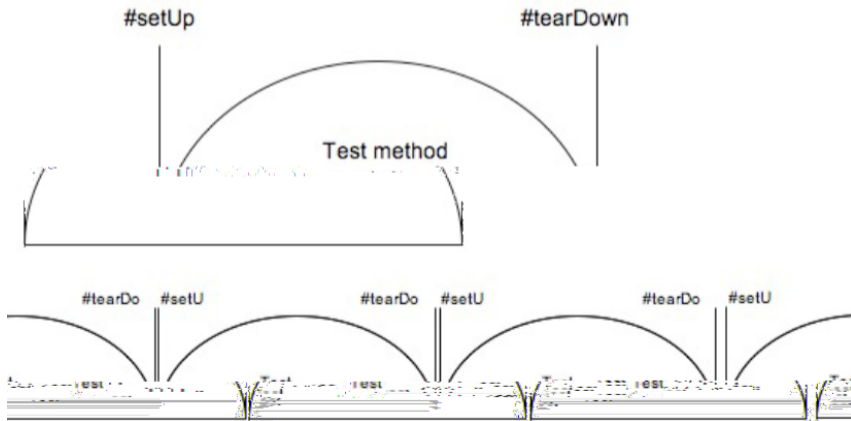
```
SetTestCase >> testOccurrences
| empty |
empty := Set new.
self
  assert: (empty occurrencesOf: 0)
  equals: 0.
empty add: 5; add: 5.
self
  assert: (empty occurrencesOf: 5)
  equals: 1
```

- empty := Set new. is repeated between tests
- We can factor it out



setUp and tearDown Messages

- Executed systematically before and after each test run
- setUp allows us to specify and reuse the context
- tearDown to clean after



Defining a setUp Method

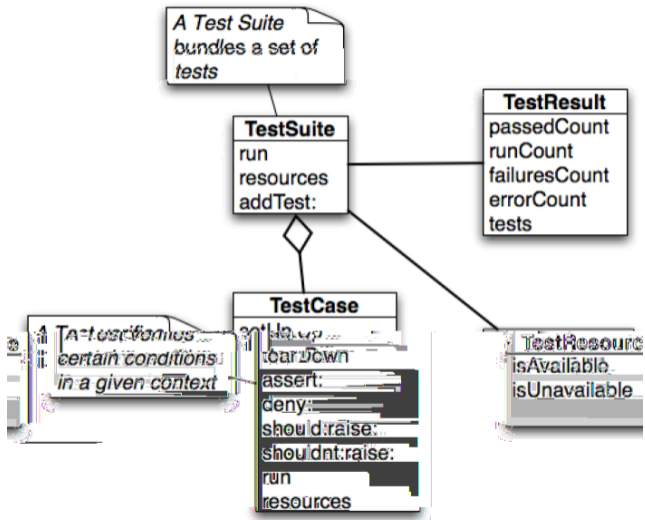
```
SetTestCase >> setUp  
  empty := Set new
```

setUp is executed for you before any test execution

```
SetTestCase >> testOccurrences  
  self  
  assert: (empty occurrencesOf: 0)  
  equals: 0.  
  empty add: 5; add: 5.  
  self  
  assert: (empty occurrencesOf: 5)  
  equals: 1
```



SUnit Core



TestSuite, TestCase and TestResult

- A TestCase represents one test
 - e.g. the method: `SetTestCase >> testOccurrenceOf`
- A TestSuite is a group of tests
 - SUnit automatically builds a suite from the methods starting with 'test*'
- A TestResult represents a test execution results



Test Resources

- A TestResource is an object which is needed by a number of Test Cases, and whose instantiation is so costly in terms of time or resources that it becomes advantageous to only initialize it once for a Test Suite run.
- A TestResource is invoked once before any test is run. (read Pharo by Example SUnit Chapter)



What You Should Know

- How to write simple tests
- Reuse a bit the context by defining `setUp` methods



Summary

- Unit tests are easy to create and run
- Create one test and run it million times!
- Use them as your life insurance
- There exists other libraries for Mock (BabyMock) or different styles of testing



Resources

- Pharo Mooc - W5S06 Videos <http://mooc.pharo.org>
- Pharo by Example <http://books.pharo.org>



A course by Stéphane Ducasse
<http://stephane.ducasse.free.fr>

Reusing some parts of the Pharo Mocc by

Damien Cassou, Stéphane Ducasse, Luc Fabresse
<http://mocc.pharo.org>



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