Spock 101

Testing in Groovy

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Testing Benefits

- Software reliability
- Good software design
- Confidence
- Safe refactoring
- Bugs reduction
- Documentation

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Why testing is a good idea?

- Are quick to run
- Explain behaviour
- Verify functionality
- Identify bugs
- Test interaction between components

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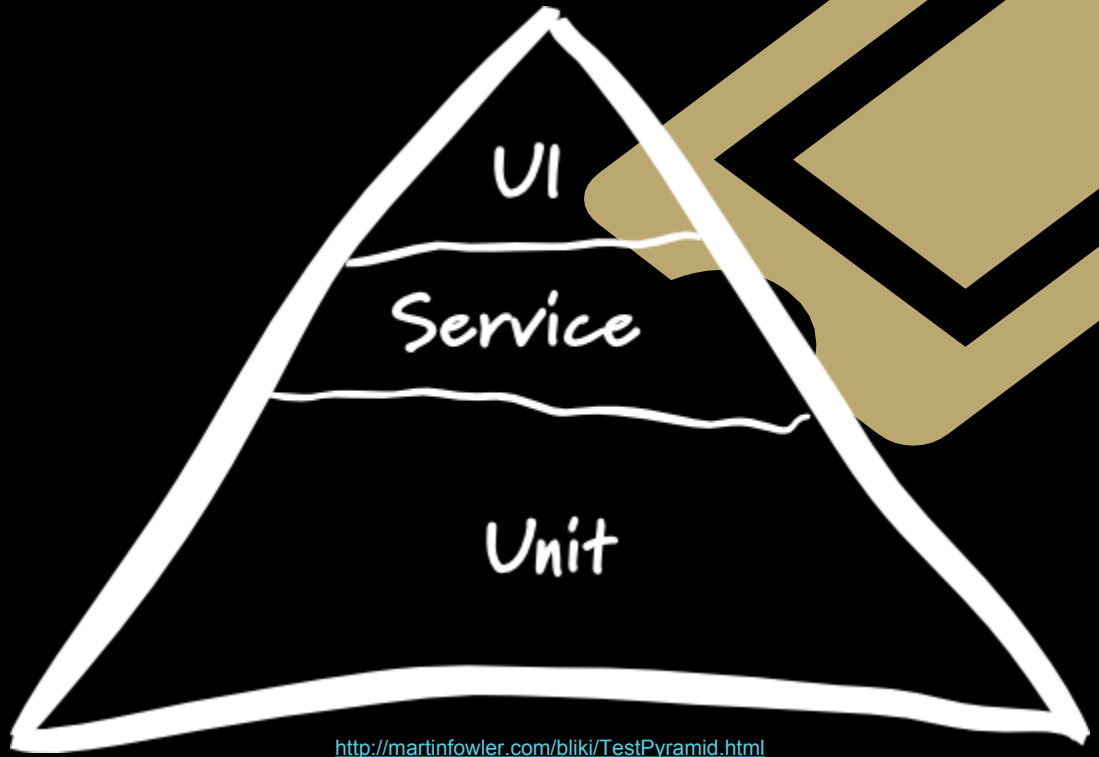
Test Pyramid



http://martinfowler.com/bliki/TestPyramid.html

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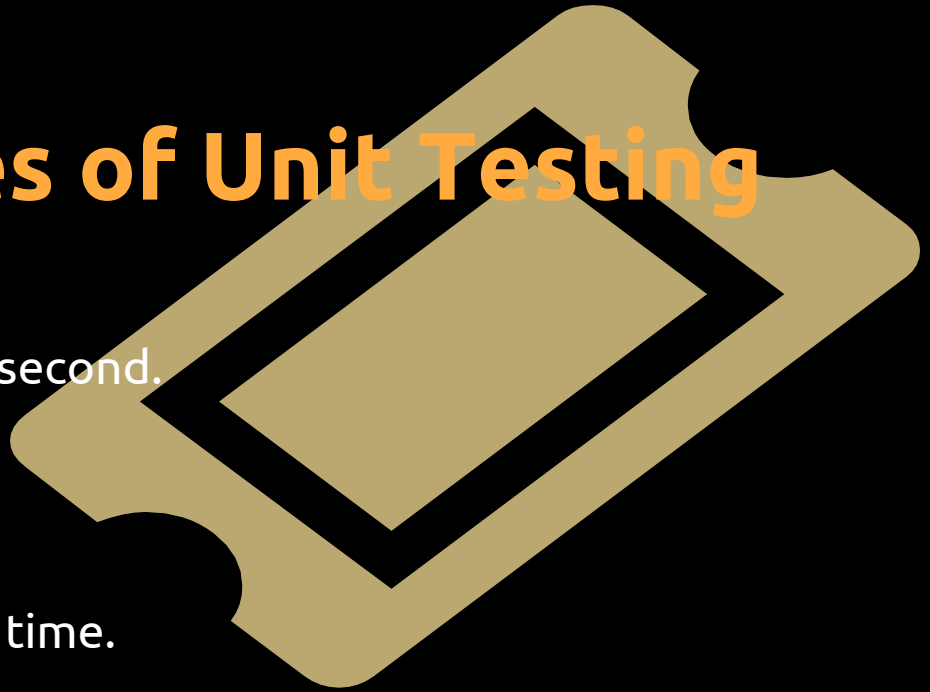
F.I.R.S.T properties of Unit Testing



- **Fast**
  - Many hundred or thousands per second.
- **Isolates**
  - Failure reasons become obvious.
- **Repeatable**
  - Run repeatedly in any order, any time.
- **Self-validating**
  - No manual validation required
- **Timely**
  - Written before the code

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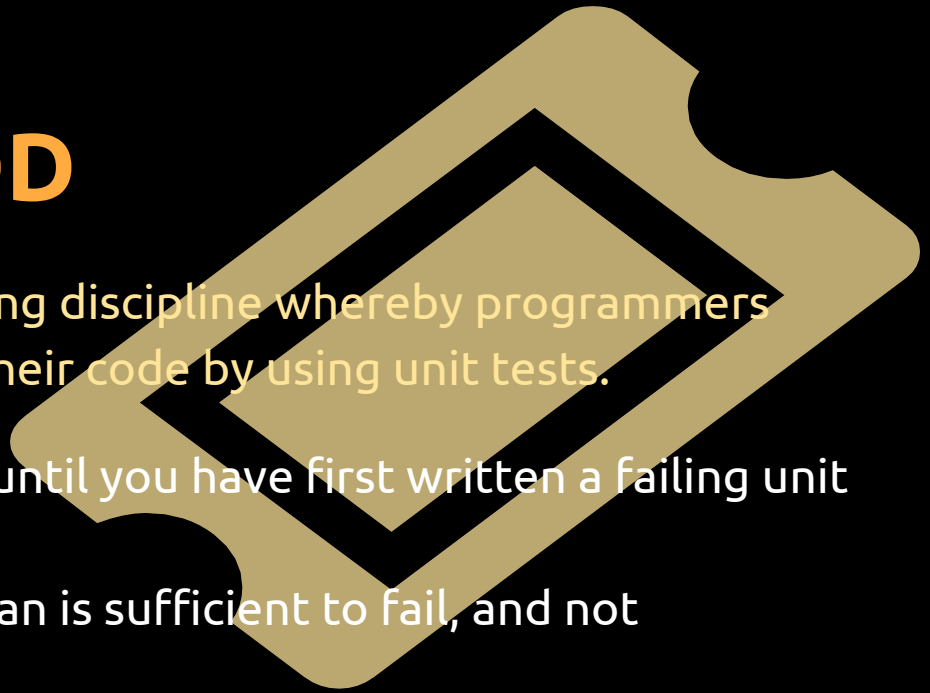
TDD

Test-Driven Development is a programming discipline whereby programmers drive the design and implementation of their code by using unit tests.

1. You can't write any production code until you have first written a failing unit test.
2. You can't write more of a unit test than is sufficient to fail, and not compiling is failing.
3. You can't write more production code than is sufficient to pass the currently failing unit test.



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Spock Framework

https://spockframework.github.io/spock/docs

https://github.com/spockframework/spock

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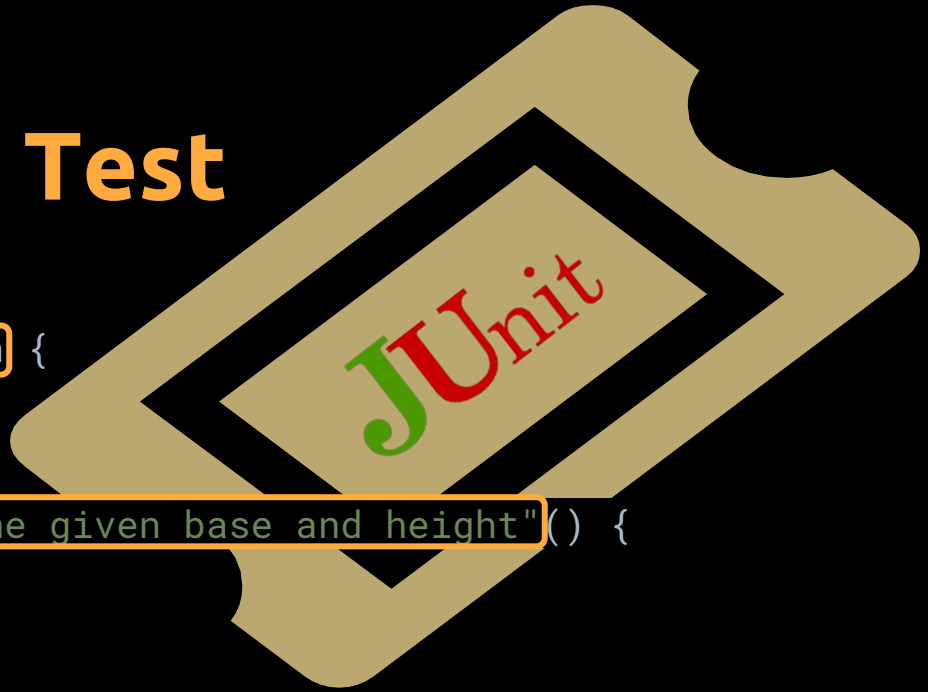
Spock Test




```
import spock.lang.Specification

class TriangleSpec extends Specification {

    def exercises = new Exercises()

    def "Calculate triangle area using the given base and height"() {
        given: "the base and height"
        def base = 3
        def height = 2

        when: "calculate triangle area"
        def area = exercises.calculateTriangleArea(base, height)

        then: "area must be the expected one"
        area == 3
    }
}
```

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Fixture Methods

```
def setup() {}          // run before every feature method
def cleanup() {}        // run after every feature method
def setupSpec() {}      // run before the first feature method
def cleanupSpec() {}    // run after the last feature method
```

Feature Methods

```
def "pushing an element on the stack"() {
   // blocks go here
}
```

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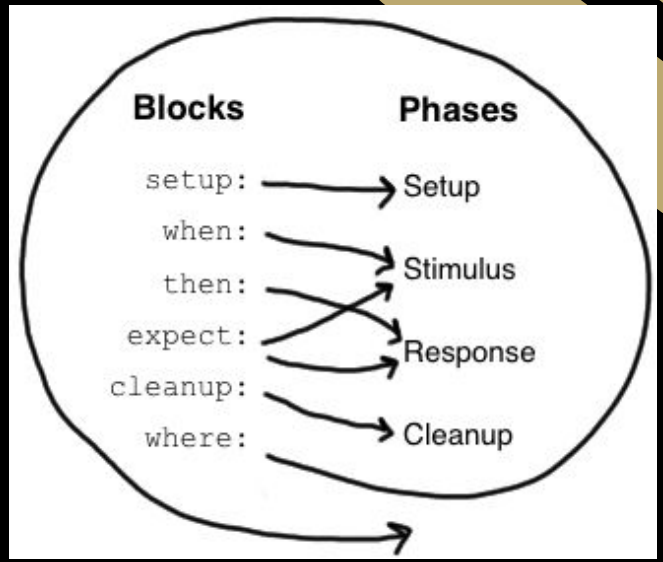
Blocks

Spock has built-in support for implementing each of the conceptual phases of a feature method.



Data Driven Tests (I)

```
class DataDrivenSpec extends Specification {
   def "maximum of two numbers"() {
       expect:
       Math.max(a, b) == c

       where:
       a | b || c
       3 | 5 || 5
       7 | 0 || 7
       0 | 0 || 0
   }
}
```

Runs as only one test

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Data Driven Tests (II)

```
class DataDrivenSpec extends Specification {
   @Unroll
   def "maximum of two numbers (max(#a, #b) == #c)"() {
       expect:
       Math.max(a, b) == c

       where:
       a | b || c
       3 | 5 || 5
       7 | 0 || 0
       0 | 0 || 0
   }
}
```

- maximum of two numbers (max(3, 5) == 5)
- maximum of two numbers (max(7, 0) == 0)

```
Math.max(a, b) == c
     |   |  |  |  |
     7   7  0  |  0
               false
```

- maximum of two numbers (max(0, 0) == 0)

Runs as three different tests

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Data Driven Tests (III)

Data Pipes

```
where:
a << [3, 7, 0]
b << [5, 0, 0]
c << [5, 7, 0]
```

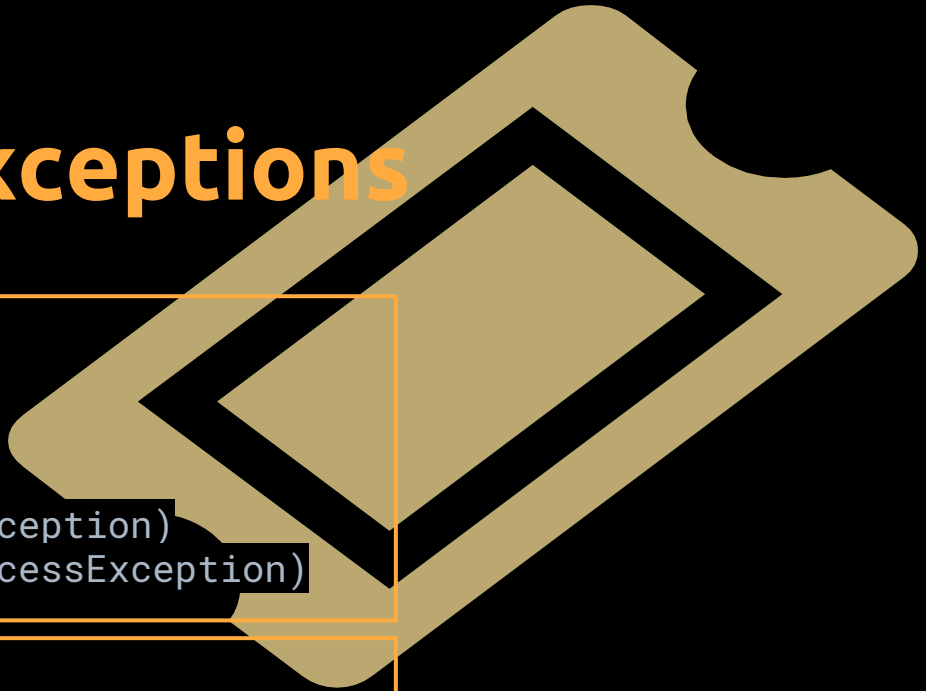
Data Variable Assignment

```
where:
a = 3
b = Math.random() * 100
c = a > b ? a : b
```

Multi-Variable Data Pipes

```
where:
[a, b, c] << sql.rows("select a, b, c from maxdata")
```

Testing Exceptions



```
when:
stack.pop()

then:
thrown(EmptyStackException)
notThrown(IllegalAccessException)
```

```
when:
stack.pop()

then:
def e = thrown(EmptyStackException)
// EmptyStackException e = thrown()
e.cause == null
```

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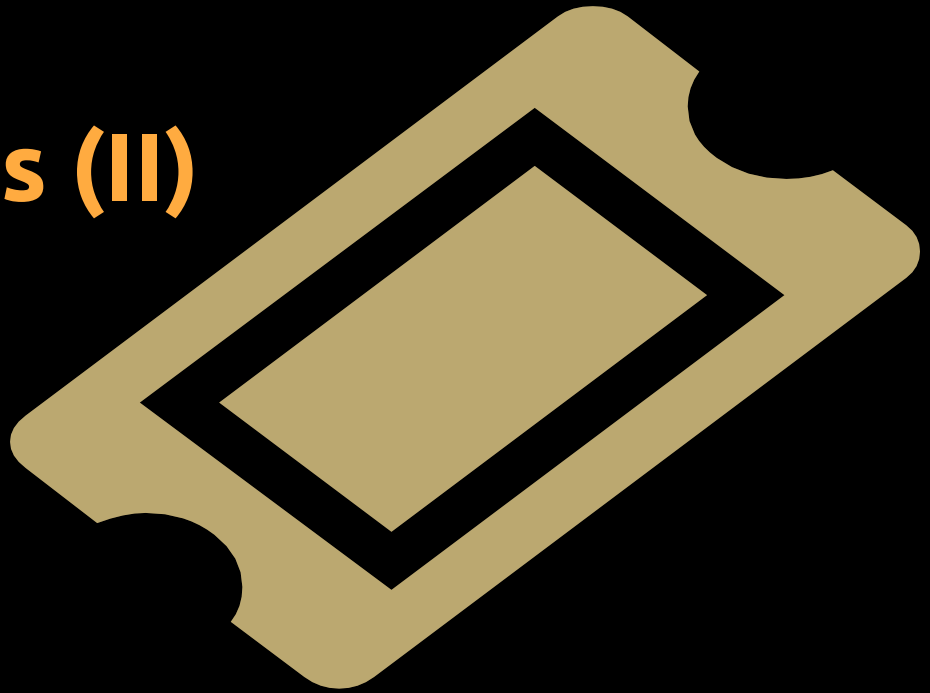
Mocks (I)

- Test interactions with collaborators
- Mock objects have no behaviour
- They only return default value for the method’s return type (false, 0, or null)
- They work with Java code
- Mock objects literally implement (or, in the case of a class, extend) the type they stand in for

Mocks (II)



```groovy
class PublisherSpec extends Specification {

    Publisher publisher = new Publisher()
    Subscriber subscriber = Mock()
    def subscriber2 = Mock(Subscriber)

    def setup() {
        publisher.subscribers << subscriber
        publisher.subscribers << subscriber2
    }

    def "should send messages to all subscribers"() {
        when:
        publisher.send("hello")

        then:
        1 * subscriber.receive("hello")
        1 * subscriber2.receive("hello")
    }
}
```

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Mocks (III)

```
1 * subscriber.receive("hello")           // exactly one call
0 * subscriber.receive("hello")           // zero calls
(1..3) * subscriber.receive("hello")      // between one and three calls (inclusive)
(1.._) * subscriber.receive("hello")      // at least one call
(_..3) * subscriber.receive("hello")      // at most three calls
_ * subscriber.receive("hello")           // any number of calls, including zero

1 * _.receive("hello")                    // a call to any mock object
1 * subscriber./r.*e/("hello")            // a method whose name matches the given regular expression
1 * subscriber.status                     // same as: 1 * subscriber.getStatus()

1 * subscriber.receive("hello")           // an argument that is equal to the String "hello"
1 * subscriber.receive(!"hello")          // an argument that is unequal to the String "hello"
1 * subscriber.receive()                  // the empty argument list (would never match in our example)
1 * subscriber.receive(_)                 // any single argument (including null)
1 * subscriber.receive(*_)                // any argument list (including the empty argument list)
1 * subscriber.receive(!null)             // any non-null argument
1 * subscriber.receive(_ as String)       // any non-null argument that is-a String
1 * subscriber.receive({ it.size() > 3 }) // an argument that satisfies the given predicate

1 * subscriber._(*_)                      // any method on subscriber, with any argument list
1 * subscriber._                          // shortcut for and preferred over the above

1 * _._                                   // any method call on any mock object
1 * _                                     // shortcut for and preferred over the above
```

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Stubs (I)

- Make collaborators respond to methods in a certain way
- Return fixed values
- Perform some side effect
- They don’t care about interactions
- Mock can be used for stubbing
- Stub cannot be used for mocking

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Stubs (II)

```
Subscriber subscriber = Stub()
subscriber.receive("message1") >> "ok"
subscriber.receive("message2") >> "fail"
```

```
def subscriber = Stub(Subscriber) {
   receive("message1") >> "ok"
   receive("message2") >> "fail"
}
```

```
subscriber.receive(_) >>> ["ok", "error", "error", "ok"]
subscriber.receive(_) >> { String message -> message.size() > 3 ? "ok" : "fail" }
subscriber.receive(_) >> { throw new InternalError("ouch") }
subscriber.receive(_) >>> ["ok", "fail", "ok"] >> { throw new InternalError() } >> "ok"
```

Let’s start working!

https://github.com/ticketbis/spock-workshop

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Thank You!

We are hiring!

...and we are remote friendly!

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