



University of
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COM1001 SPRING SEMESTER

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Writing Automated Tests with RSpec

RSpec

RSpec is a tool that we can use to write automated test cases.

It has some similarities but important differences with **JUnit**.

First of all, **it can be used for testing at all different scopes** – unit, integration, system, not just unit testing, as with JUnit.

Secondly, it takes a **behaviour-driven approach**.

Tests *describe* how some aspect of the system should work. These descriptions map easily to a **Given-When-Then** structure, making it easy to translate **acceptance criteria from user stories into tests.**

The Bare Bones

We need the
`rspec` gem

```
require "rspec"

RSpec.describe "A sandwich" do
  # ...
  it "tastes delicious" do
    # ...
  end
end
```

We're describing
how a **sandwich**
should behave

The sandwich
should taste
delicious (else
what's the point?!)

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Actual code would go here if this were a real test – to set up the sandwich and to check that it does indeed taste delicious!

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A Slightly More Complex Example

```
require "rspec"

RSpec.describe "A sandwich" do
  context "when it contains salad" do
    # ...
    it "is healthy" do
      # ...
    end
  end

  context "when it contains cheese" do
    # ...
    it "is delicious" do
      # ...
    end
  end
end
```

We can check the behaviour of our sandwich in different scenarios (contexts)

Note how this maps to the **Given-When-Then** style of acceptance criteria:

Given a sandwich
When it contains cheese
Then it is delicious

(Apologies to any vegans...)

RSpec in Practice – testing `strip`

Suppose we need to write tests for the `strip` Ruby method, which can be invoked on strings.

The `strip` method removes leading and trailing whitespace from a string, and is often used to sanitise inputs that users enter into forms.


```

require "rspec"

RSpec.describe String do
  describe ".strip" do
    context "when invoked on a string with leading spaces" do
      it "returns the string with the leading spaces removed" do
        expect("  hello".strip).to eq("hello")
      end
    end

    context "when invoked on a string with trailing spaces" do
      it "returns the string with the trailing spaces removed" do
        expect("hello  ".strip).to eq("hello")
      end
    end

    context "when invoked on a string with no leading or trailing spaces" do
      it "returns the same string" do
        expect("hello".strip).to eq("hello")
      end
    end
  end
end

```

Since the strip method is part of the **String** class, this is part of the description of how a string should work in Ruby

The second **describe** block is for the strip method itself (written **.strip** by convention)

Finally, some test code! Here we're asserting the actual output is equal to that expected (**"hello"**). These types of statements are called **expectations**.

Matchers

Expectations are expressed in the form:

```
expect(actual_result).to/not_to matcher(expected_result)
```

e.g., `expect(result).to eq(0)`

Other examples of **matchers** include:

Matcher	Passes if...
<code>be true</code>	<code>actual_result == true</code>
<code>be false</code>	<code>actual_result == false</code>
<code>be_nil</code>	<code>actual_result.nil?</code>
<code>be < expected_result</code>	<code>actual_result < expected_result</code>
<code>be > expected_result</code>	<code>actual_result > expected_result</code>
<code>be <= expected_result</code>	<code>actual_result <= expected_result</code>
<code>be >= expected_result</code>	<code>actual_result >= expected_result</code>
<code>be_between(x, y).inclusive</code>	<code>actual_result >= x && actual_result <= y</code>
<code>start_with(x)</code>	<code>actual_result.start_with?(x)</code>
<code>include(x)</code>	<code>actual_result.include?(x)</code>

For more information, see the RSpec documentation at <https://rspec.info/documentation>



Live Demonstration:

`week5/rspec_example/
string_strip_rspec.rb`

(from the COM1001 GitHub repository)

Featuring:

- Running rspec on a file or directory
- Failing tests