

Testing using Serenity BDD and Cucumber in Java

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Overview

[Serenity BDD](#) is a framework for assisting in automated acceptance testing using BDD.

It provides the ability to write executable specifications, run them and produce comprehensive reports.

In this tutorial, we will create some tests using Serenity BDD along with Cucumber. The specification will be done using standard Cucumber .feature files, where each test is written as a Scenario or Scenario Outline. The corresponding steps implementation will be done in Java.

The tutorial details slightly different instructions depending on where you want to perform the edition of your features and corresponding scenarios (please check the [possible workflows](#)).

Requirements

- serenity-bdd
- cucumber
- chromedriver (a version that supports your current Chrome version)
- maven
- Chrome

Description

This tutorial is highly based on an existing [Serenity+Cucumber quick start project](#) with some minor changes.

The business-readable tests aim to validate a search engine using some examples that interact with it using Selenium WebDriver and Chrome.



Please note

The code used for this tutorial can be found [here](#); you may also find the original unchanged project [here](#).

The serenity configuration file can be used as such but it can be updated to customize certain Serenity behaviours.

serenity.properties

```
serenity.project.name=Serenity and Cucumber Quick Start
```

Even though you could follow the page-objects pattern, Serenity favors the [Screenplay pattern](#). Thus, instead of abstracting every single page as a class using the page-objects pattern, users are advised to implement classes that abstract an actor/personna that interacts with the application.

These actors can perform business-understandable actions/tasks, also known as steps. In code they should have the `@Step` annotation, so they can be understood as such and appear in the reports, for example.

One can see each actor/personna related class as a step library. A step library adds a layer of abstraction between the "what" and the "how" of our acceptance tests.

Multiple step libraries can be used to provide the building blocks for writing the our executable test specification.



Please note

Steps should be focused in the "what" we are aiming to achieve and not on the "how". A step can, in turn, invoke other more technical methods that implement the "how".

Whenever using Cucumber along with Serenity, Cucumber step definitions are used as an additional layer of abstraction on top of standard step libraries.

Methods implementing them use the typical Gherkin @Given, @When, @Then annotations from the Cucumber library.

```
@Steps
NavigateTo navigateTo;
...
@When("^s?he searches for \"(.*)\"")
public void i_search_for(String term) {
    searchFor.term(term); // this
}
```

In this tutorial, all steps are defined and referenced from within a class. Some variables have the @Steps annotation, so their respective class has also business-related steps.

src/test/java/starter/stepdefinitions/SearchOnDuckDuckGoStepDefinitions.java

```
package starter.stepdefinitions;

import io.cucumber.java.en.Given;
import io.cucumber.java.en.Then;
import io.cucumber.java.en.When;
import net.thucydides.core.annotations.Steps;
import starter.navigation.NavigateTo;
import starter.search.SearchFor;
import starter.search.SearchResult;

import static org.assertj.core.api.Assertions.assertThat;
import static starter.matchers.TextMatcher.textOf;

public class SearchOnDuckDuckGoStepDefinitions {

    @Steps
    NavigateTo navigateTo;

    @Steps
    SearchFor searchFor;

    @Steps
    SearchResult searchResult;

    @Given("^(?:.*) is on the DuckDuckGo home page")
    public void i_am_on_the_DuckDuckGo_home_page() {
        navigateTo.theDuckDuckGoHomePage();
    }

    @When("^s?he searches for \"(.*)\"")
    public void i_search_for(String term) {
        searchFor.term(term);
    }

    @Then("^all the result titles should contain the word \"(.*)\"")
    public void all_the_result_titles_should_contain_the_word(String term) {
        assertThat(searchResult.titles())
            .matches(results -> results.size() > 0)
            .allMatch(title -> textOf(title).containsIgnoringCase(term));
    }
}
```

By default, standard Cucumber .feature files live in the `src/test/resources/features` directory.

However, this can be customized as a option to the runner class.

src/test/java/starter/CucumberTestSuite.java

```
...
@RunWith(CucumberWithSerenity.class)
@CucumberOptions(
    features = "features/",
    plugin = {
        "pretty", "html:target/serenity-reports//serenity-html-report",
        "json:target/serenity-reports/cucumber_report.json",
        "rerun:target/serenity-reports/rerun.txt"
    }
)
...
```

It can also be enforced whenever running maven from the command line using a system property (e.g. `-Dcucumber.features="features/"`).

We will also configure the runner to generate a Cucumber JSON report containing test results that can be processed by Xray.

We've updated slightly the feature from the upstream project, to make the two scenarios a bit more different. You can also see a tag before the "Feature", which gives the ability to automatically link the scenarios to some existing story/requirement in Jira.

src/test/resources/features/search/search_by_keyword.feature

```
@REQ_CALC-6399
Feature: Search by keyword

@cucumber @green
Scenario: Searching for a food term
    Given Sergey is on the DuckDuckGo home page
    When he searches for "cucumber food"
    Then all the result titles should contain the word "recipes"

@cucumber @brown
Scenario: Searching for a gherkin
    Given Sergey is on the DuckDuckGo home page
    When he searches for "cucumber"
    Then all the result titles should contain the word "cucumber"
```

Remember that we need to manage:

- features (declarative specifications, usually stored in .feature files)
- their implementation

Besides that, you need to decide is which workflow we'll use: do we want to use Xray/Jira as the master for writing the declarative specification or do we want to manage those in Git, for example?



Learn more

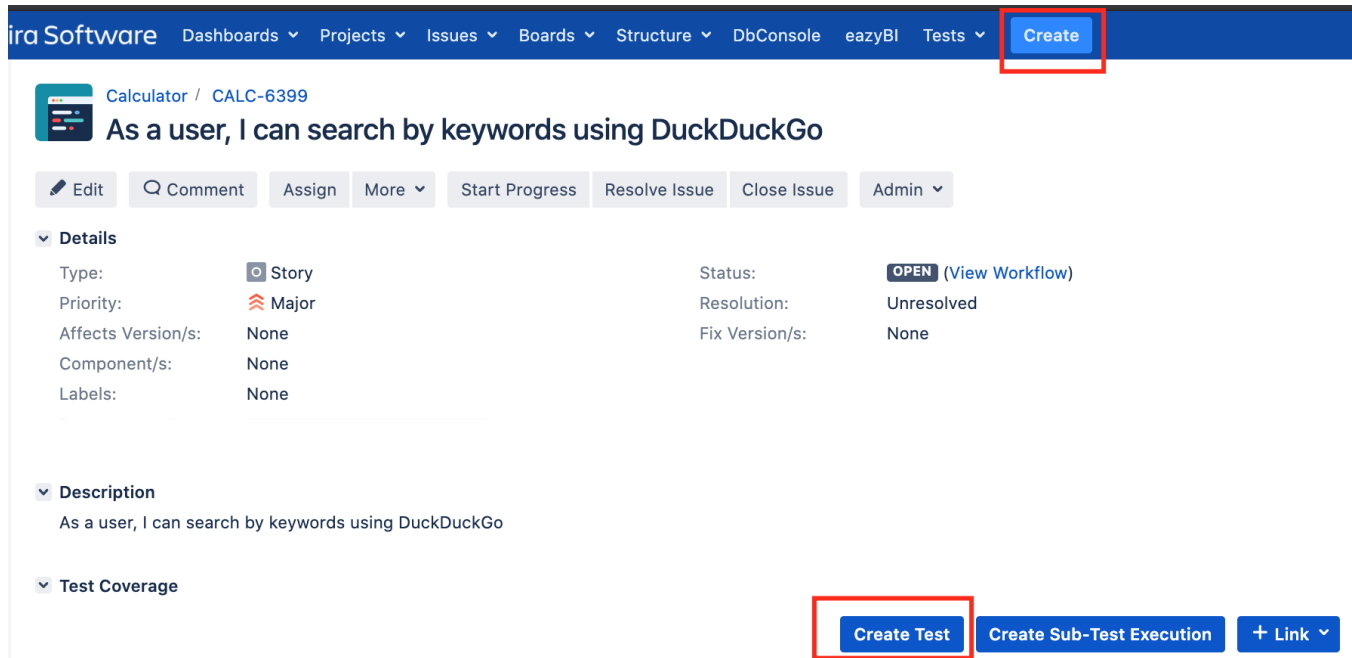
Please see [Testing in BDD with Gherkin based frameworks \(e.g. Cucumber\)](#) for an overview of the possible workflows.

Using Jira and Xray as master

This section assumes using Xray as master, i.e. the place that you'll be using to edit the specifications (e.g. the scenarios that are part of .feature files).

The first step is to create "Cucumber" Tests, of Cucumber Type "Scenario", in Jira.

Test can be created from the user story of using the standard Jira's issue create button/action.



The screenshot shows a Jira issue page for 'Calculator / CALC-6399'. The issue title is 'As a user, I can search by keywords using DuckDuckGo'. The issue type is 'Story' with a priority of 'Major'. The status is 'OPEN' with a link to 'View Workflow'. The resolution is 'Unresolved' and the fix version is 'None'. The description is 'As a user, I can search by keywords using DuckDuckGo'. The 'Test Coverage' section is expanded. The 'Create' button in the top navigation bar is highlighted with a red box. At the bottom right, the 'Create Test' button is also highlighted with a red box.

The specification would be exactly the same as the one provided in one of the scenarios in the the original repository.

The test is quite self-explanatory, which is the ultimate purpose of using this approach: a browser is open on the "DuckDuckGo" home page, search by "cucumber" and then we check if all results contain the word "cucumber" in the title.

Calculator / CALC-6398

Searching for a gherkin

Test Details

Type: Cucumber Scenario Type: Scenario

Scenario:

1 Given Sergey is on the DuckDuckGo home page

2 When he searches for "cucumber"

3 Then all the result titles should contain the word "cucumber"

Press Ctrl + Space to get step suggestions.

Autocomplete based on labels: Filter Labels

Save Cancel



Calculator / CALC-6398

Searching for a gherkin

[Edit](#) [Comment](#) [Assign](#) [More](#) [Start Progress](#) [Resolve Issue](#) [Close Issue](#) [Admin](#)

Details

Type:	Test	Status:	OPEN View Workflow
Priority:	Medium	Resolution:	Unresolved
Affects Version/s:	None	Fix Version/s:	None
Component/s:	None		
Labels:	brown cucumber		

Description

[Click to add description](#)

Test Details

Type:	Cucumber
Scenario Type:	Scenario
Scenario:	<div>Given Sergey is on the DuckDuckGo home page</div> <div>When he searches for "cucumber"</div> <div>Then all the result titles should contain the word "cucumber"</div>

We would repeat this for every Scenario/Scenario we would like to specify.

Then, we need to export these executable scenarios as .feature file(s) in order to run them (locally or in the CI environment). This may be done via the REST API, or the **Export to Cucumber** UI action from within the Test/Test Execution issue or even based on an existing saved filter.

In this case, we are going to use a saved filter in Jira. The filter can contain Test issues, to user stories, Test Plans, Test Executions; Xray will always find out the related Test issues.

serenity_cucumber_demo


[Save as](#)[Details](#) ★

✓ key = CALC-6398 OR key = CALC-6397

1-2 of 2

T	Key	Summary	P	Status
	CALC-6398	Searching for a gherkin		OPEN
	CALC-6397	Searching for a food term		OPEN

A plugin for your CI tool of choice (e.g. Jenkins) can be used to ease this task.

 **Xray: Cucumber Features Export Task**

JIRA Instance

xray-vm

Issues:

Filter:

13100

File Path:

features

You could also do it from the command line.

example of exporting features from the command line

```
curl -u admin:admin "http://jiraserver.example.com/rest/raven/1.0/export/test?filter=13100&fz=true" -o features.zip
rm -rf features/*
unzip -o features.zip -d features
```

We will store the exported .feature(s) in a temporary folder (e.g. features/), that we need to clean before the export process.

After being exported, the created .feature file will be similar to the original one but will contain the references to the Test issue key and the covered requirement issue key.

@REQ_CALC-6399

Feature: As a user, I can search by keywords using DuckDuckGo
#As a user, I can search by keywords using DuckDuckGo

@TEST_CALC-6398 @brown @cucumber @src/test/resources/features/search/search_by_keyword.feature

Scenario: Searching for a gherkin

Given Sergey is on the DuckDuckGo home page

When he searches for "cucumber"

Then all the result titles should contain the word "cucumber"

@TEST_CALC-6397 @cucumber @green @src/test/resources/features/search/search_by_keyword.feature

Scenario: Searching for a food term

Given Sergey is on the DuckDuckGo home page

When he searches for "cucumber food"

Then all the result titles should contain the word "recipes"

Tests can be run using Maven; we need to tell the runner to pick the .feature files from the "features/" folder using the "cucumber.features" system property.

```
rm -r target/serenity-reports/*  
mvn clean verify -Denvironment=staging -Dcucumber.features="features/"
```

After running the tests and generating the Cucumber JSON report (e.g., [cucumber_report.json](#)), it can be imported to Xray via the REST API or the **Import Execution Results** action within the Test Execution or by using one of available plugins for [CI tools](#).

Post-build Actions

Xray: Results Import Task

JIRA Instance

Format

Parameters

Execution Report File (file path with file name)

example of importing results from the command line

```
curl -H "Content-Type: application/json" -X POST -u admin:admin --data @"target/serenity-reports/cucumber_report.json" http://jiraserver.example.com/rest/raven/1.0/import/execution/cucumber
```

A Test Execution containing the results for each test scenario will be created.

Calculator / CALC-6413

Execution results [1588497187957]

Edit Comment Synchronize Tests from... More Close Issue Reopen Issue Admin

Details

Type: Test Execution Status: **RESOLVED** (View Workflow)
Priority: Medium Resolution: Fixed
Affects Version/s: None Fix Version/s: None
Component/s: None
Labels: None
Test Environments: None
Test Plan: None

Description

Execution results imported from external source

Tests

+ Add

Overall Execution Status

1 PASS 1 FAIL

Total Tests: 2

Filter(s)



Apply Rank

Show 100 entries

Columns

	Rank	Key	Summary	Test Type	#Req	#Def	Assignee	Status	
<input type="checkbox"/>	2	CALC-6397	Searching for a food term	Cucumber	1	0	Administrator	FAIL	...
<input type="checkbox"/>	1	CALC-6398	Searching for a gherkin	Cucumber	1	0	Administrator	PASS	...

The execution screen details will provide information on the test run result that includes step-level information including duration; in this case we can only see the Gherkin-level keywords.

Calculator / Test Execution: CALC-6413 / Test: CALC-6397

Searching for a food term



Import Execution Results

Export to Cucumber


Return to Test Execution

Previous

Results

Context	Duration	Status
-	6 sec	FAIL
Steps		
Given Sergey is on the DuckDuckGo home page	3428.000 ms	PASS
When he searches for "cucumber food"	3005.000 ms	PASS
Then all the result titles should contain the word "recipes"	106.000 ms	FAIL
<pre>java.lang.AssertionError: Expecting all elements of: <["Sea cucumber as food - WikipediaYour browser indicates if you've visited this link", "1,000+ Free Cucumber & Food Images - PixabayYour browser indicates if you've visited this link", "11 Best Cucumber Recipes Easy Cucumber Recipes - NDTV FoodYour browser indicates if you've visited this link", "Cucumbers World's Healthiest Foods RatingYour browser indicates if you've visited this link", "7 Health Benefits of Eating CucumberYour browser indicates if you've visited this link", "Cucumber recipes BBC Good FoodYour browser indicates if you've visited this link", "7 Coolest Benefits Of Cucumbers You Cannot Miss Organic FactsYour browser indicates if you've visited this link", "Cucumber Recipes : Food Network Food NetworkYour browser indicates if you've visited this link", "Cucumber recipes - BBC FoodYour browser indicates if you've visited this link", "Smashed Cucumber Salad Recipe - How to Make the... - YouTubeYour browser indicates if you've visited this link"]> to match given predicate but this element did not: <"Sea cucumber as food - WikipediaYour browser indicates if you've visited this link"> at java.util.Optional.ifPresent(Optional.java:159) at starter.stepdefinitions.SearchOnDuckDuckGoStepDefinitions.all_the_result_titles_should_contain_the_word(SearchOnDuckDuckGoStepDefinitions.java:39) at *.all the result titles should contain the word "recipes"(file:///Users/smsf/exps/serenity-cucumber-starter/features/1_CALC-6399.feature:17)</pre>		

On the "requirement"/user story side (i.e the "feature") we can also see how this result impacting on the coverage.

 Calculator / CALC-6399

As a user, I can search by keywords using DuckDuckGo

EditCommentAssignMoreStart ProgressResolve IssueClose IssueAdmin

Details

Type:Story

Priority:Major

Affects Version/s:None

Component/s:None

Labels:None

Requirement Status:NOK

Status:OPEN (View Workflow)

Resolution:Unresolved

Fix Version/s:None

Description

As a user, I can search by keywords using DuckDuckGo

Test Coverage

Create TestCreate Sub-Test Execution+ Link

TEST COVERAGE FOR THE FOLLOWING ANALYSIS SCOPE						
Scope: Version; Version: None - latest execution; Environment: All Environments						NOK
Filter(s)						
Show 10 entriesColumns						
P	Status	Resolution	Key	Summary	Test Runs	Test Status
<input type="checkbox"/>	OPEN	Unresolved	CALC-6397	Searching for a food term	10	FAIL
<input type="checkbox"/>	OPEN	Unresolved	CALC-6398	Searching for a gherkin	10	PASS

Using Git or other VCS as master

You can edit your .feature outside of Jira/Xray (eventually storing them in your VCS using Git, for example).

In our example, the feature file can be found at src/test/resources/features/search/search_by_keyword.feature.

src/test/resources/features/search/search_by_keyword.feature

```
@REQ_CALC-6399
Feature: Search by keyword

  @cucumber @green
  Scenario: Searching for a food term
    Given Sergey is on the DuckDuckGo home page
    When he searches for "cucumber food"
    Then all the result titles should contain the word "recipes"

  @cucumber @brown
  Scenario: Searching for a gherkin
    Given Sergey is on the DuckDuckGo home page
    When he searches for "cucumber"
    Then all the result titles should contain the word "cucumber"
```

Note: we can link the tests/scenarios to an existing user story/requirement in Jira/Xray by adding a tag before the "Feature" element.

In any case, you'll need to synchronize your .feature files to Jira/Xray so that you can have visibility of them and report results against them.

Thus, you need to import your .feature files to Xray/Jira which will create (or update) Test and Pre-Condition entities in Xray. The process is idem-potent.

You can invoke the REST API directly, or use one of the available plugins for well-known CI tools (e.g. Jenkins), and choose the destination project.

Build

Xray: Cucumber Features Import Task

Jira Instance	<input type="text" value="xray-vm"/>	?
Project Key	<input type="text" value="CALC"/>	?
Cucumber feature files directory	<input type="text" value="features"/>	?
Modified in the last hours	<input type="text" value="10"/>	?

Sample shell script

```
rm features.zip
zip -r features.zip src/test/resources/features/ -i \*.feature
curl -H "Content-Type: multipart/form-data" -u admin:admin -F "file=@features.zip" "http://jiraserver.example.com/rest/raven/1.0/import/feature?projectKey=CALC"
```

The tests will be created (or updated if they already exist); we may notice that there's a specific label being added to keep track of the original .feature where the scenario came from.



Calculator / CALC-6397

Searching for a food term

Edit

Comment

Assign

More

Start Progress

Resolve Issue

Close Issue

Admin

Details

Type:	Test	Status:	OPEN (View Workflow)
Priority:	Medium	Resolution:	Unresolved
Affects Version/s:	None	Fix Version/s:	None
Component/s:	None		
Labels:	cucumber green src/test/resources/features/search/search_by_keyword.feature		

Description

Click to add description

Test Details

Type:	Cucumber
Scenario Type:	Scenario
Scenario:	Given Sergey is on the DuckDuckGo home page When he searches for "cucumber food" Then all the result titles should contain the word "recipes"



Calculator / CALC-6398

Searching for a gherkin

Edit

Comment

Assign

More

Start Progress

Resolve Issue

Close Issue

Admin

Details

Type:	Test	Status:	OPEN (View Workflow)
Priority:	Medium	Resolution:	Unresolved
Affects Version/s:	None	Fix Version/s:	None
Component/s:	None		
Labels:	brown cucumber src/test/resources/features/search/search_by_keyword.feature		

Description

Click to add description

Test Details

Type:	Cucumber
Scenario Type:	Scenario
Scenario:	Given Sergey is on the DuckDuckGo home page When he searches for "cucumber" Then all the result titles should contain the word "cucumber"



Please note

In simple terms, each Scenario of each .feature will be created as a Test issue that contains unique identifiers, so that if you import once again then Xray can update the existent Test and don't create any duplicated tests; each Background will be created as a Pre-Condition.

More info in [Importing Cucumber Tests - REST](#).

Afterward, you can export those features out of Jira based on some criteria, so they are properly tagged.

As an example, we can export the tests based on the covered issue; you could use also a saved Jira filter using its filter id.

Below you can see an example using [Xray Jenkins plugin](#).

Xray: Cucumber Features Export Task

JIRA Instance:

Issues:

Filter:

File Path:

[Click here for more details](#)

You could also do it from the command line.

example of exporting features from the command line

```
curl -u admin:admin "http://jiraserver.example.com/rest/raven/1.0/export/test?keys=CALC-6399&fz=true" -o features.zip
rm -rf features/*
unzip -o features.zip -d features
```

This will produce a .feature file with the Scenario(s)/Scenario Outline(s) tagged with the respective Test issue keys.

features/1_CALC-6399.feature

```
@REQ_CALC-6399
Feature: As a user, I can search by keywords using DuckDuckGo
  #As a user, I can search by keywords using DuckDuckGo

  @TEST_CALC-6398 @brown @cucumber @src/test/resources/features/search/search_by_keyword.feature
  Scenario: Searching for a gherkin
    Given Sergey is on the DuckDuckGo home page
    When he searches for "cucumber"
    Then all the result titles should contain the word "cucumber"

  @TEST_CALC-6397 @cucumber @green @src/test/resources/features/search/search_by_keyword.feature
  Scenario: Searching for a food term
    Given Sergey is on the DuckDuckGo home page
    When he searches for "cucumber food"
    Then all the result titles should contain the word "recipes"
```

Tests can be run using Maven; we need to tell the runner to pick the .feature files from the "features/" folder using the "cucumber.features" system property.

```
rm -r target/serenity-reports/*
mvn clean verify -Denvironment=staging -Dcucumber.features="features/"
```

After running the tests and generating the Cucumber JSON report (e.g., [cucumber_report.json](#)), it can be imported to Xray via the REST API or the **Import Execution Results** action within the Test Execution or by using one of available plugins for [CI tools](#).

Post-build Actions

Xray: Results Import Task

JIRA Instance

Format


Parameters

Execution Report File (file path with file name)

example of importing results from the command line

```
curl -H "Content-Type: application/json" -X POST -u admin:admin --data @"target/serenity-reports/cucumber_report.json" http://jiraserver.example.com/rest/raven/1.0/import/execution/cucumber
```

A Test Execution containing the results for each test scenario will be created.

 Calculator / CALC-6413

Execution results [1588497187957]

[Edit](#) [Comment](#) [Synchronize Tests from...](#) [More](#) [Close Issue](#) [Reopen Issue](#) [Admin](#)

Details

Type: **Test Execution** Status: **RESOLVED** ([View Workflow](#))
Priority: **Medium** Resolution: **Fixed**
Affects Version/s: **None** Fix Version/s: **None**
Component/s: **None**
Labels: **None**
Test Environments: **None**
Test Plan: **None**

Description

Execution results imported from external source

Tests [+ Add](#)

Overall Execution Status

1 PASS 1 FAIL

Total Tests: 2

[Filter\(s\)](#)

Apply Rank

Show 100 entries Columns

Rank	Key	Summary	Test Type	#Req	#Def	Assignee	Status	
2	CALC-6397	Searching for a food term	Cucumber	1	0	Administrator	FAIL	▶ ...
1	CALC-6398	Searching for a gherkin	Cucumber	1	0	Administrator	PASS	▶ ...

The execution screen details will provide information on the test run result that includes step-level information including duration; in this case we can only see the Gherkin-level keywords.

Calculator / Test Execution: CALC-6413 / Test: CALC-6397

Searching for a food term

Import Execution ResultsExport to CucumberReturn to Test ExecutionPrevious

Results

Context	Duration	Status
-	6 sec	FAIL
Steps		
Given Sergey is on the DuckDuckGo home page	3428.000 ms	PASS
When he searches for "cucumber food"	3005.000 ms	PASS
Then all the result titles should contain the word "recipes"	106.000 ms	FAIL

```
java.lang.AssertionError:  
Expecting all elements of:  
<["Sea cucumber as food - WikipediaYour browser indicates if you've visited this link",  
"1,000+ Free Cucumber & Food Images - PixabayYour browser indicates if you've visited this link",  
"11 Best Cucumber Recipes | Easy Cucumber Recipes - NDTV FoodYour browser indicates if you've visited this link",  
"Cucumbers | World's Healthiest Foods RatingYour browser indicates if you've visited this link",  
"7 Health Benefits of Eating CucumberYour browser indicates if you've visited this link",  
"Cucumber recipes | BBC Good FoodYour browser indicates if you've visited this link",  
"7 Coolest Benefits Of Cucumbers You Cannot Miss | Organic FactsYour browser indicates if you've visited this link",  
"Cucumber Recipes : Food Network | Food NetworkYour browser indicates if you've visited this link",  
"Cucumber recipes - BBC FoodYour browser indicates if you've visited this link",  
"Smashed Cucumber Salad Recipe - How to Make the... - YouTubeYour browser indicates if you've visited this link"]>  
to match given predicate but this element did not:  
<"Sea cucumber as food - WikipediaYour browser indicates if you've visited this link">  
  at java.util.Optional.ifPresent(Optional.java:159)  
  at starter.stepdefinitions.SearchOnDuckDuckGoStepDefinitions.all_the_result_titles_should_contain_the_word(SearchOnDuckDuckGoStepDefinitions.java:39)  
  at *.all the result titles should contain the word "recipes"(file:///Users/smsf/exps/serenity-cucumber-starter/features/1_CALC-6399.feature:17)
```

On the “requirement”/user story side (i.e the “feature”) we can also see how this result impacting on the coverage.

Calculator / CALC-6399

As a user, I can search by keywords using DuckDuckGo

EditCommentAssignMoreStart ProgressResolve IssueClose IssueAdmin

Details

Type:StoryStatus:OPEN (View Workflow)
Priority:MajorResolution:Unresolved
Affects Version/s:NoneFix Version/s:None
Component/s:None
Labels:None
Requirement Status:NOK

Description

As a user, I can search by keywords using DuckDuckGo

Test Coverage

Create TestCreate Sub-Test ExecutionLink

TEST COVERAGE FOR THE FOLLOWING ANALYSIS SCOPE

Scope: Version; Version: None - latest execution; Environment: All Environments

NOK

Filter(s)

Show 10 entriesColumns

P	Status	Resolution	Key	Summary	Test Runs	Test Status
<input type="checkbox"/>	OPEN	Unresolved	CALC-6397	Searching for a food term	10	FAIL
<input type="checkbox"/>	OPEN	Unresolved	CALC-6398	Searching for a gherkin	10	PASS

If we change the specification (i.e. the Gherkin scenarios), we need to import the .feature(s) once again.
Therefore, in the CI we always need to start by importing the .feature file(s) to keep Jira/Xray on synch.

References

- [Serenity BDD \(formerly Thucydides\)](#)
- <https://johnfergusonsmart.com/serenity-bdd/>
- [Sample project using Serenity and Cucumber](#)
- [Step libraries article](#)
- [An Introduction to BDD Test Automation with Serenity and Cucumber-JVM](#)