Caltech | Center for Technology & Management Education

Full Stack Java Developer

simplilearn

Cucumber

TECHNOLOGY

Introduction to Cucumber

```
#include <iostream>
#include <cstdlib>
using namespace std;
int main()
{
    cout << "Hello, world!" << endl;
    return 0;
}
```

Learning Objectives

By the end of this lesson, you will be able to:

- Define Cucumber and explain its benefits
- List the advantages of using Cucumber over traditional methods
- Understand what BDD is and how it works in Cucumber automation
- List the characteristics of BDD
- Understand feature files in terms of Cucumber

Learning Objectives

By the end of this lesson, you will be able to:

- Learn Gherkins language and its significance
- Define important terms to Gherkins with examples
- Learn what are step definitions in Cucumber
- Install the Cucumber Eclipse plugin

A Day in the Life of a Full Stack Developer

You are working in an organization and have been assigned a project. After understanding the client's requirements, you analyze and tend to improve the application’s behavior. You can work on Java applications.

You are asked to define the application's behavior, provide scripts, aid Junit, and facilitate the creation of test cases.

To do so, you need to explore and work with Cucumber.

What Is Cucumber?

What Is Cucumber?

Cucumber is a behavior-driven development (BDD) tool. It:

Defines an application’s behaviour

Provides scripts

Aids JUnit

Facilitates the creation of test cases

Advantages of Cucumber

Runs on Java.net and Ruby languages

Allows fast and easy execution and integration

Builds a bridge between the technical language and commercial enterprise

Provides reusability of code

Allows to note the script without knowing any programming language

Offers an end-to-end testing framework

Behavior-Driven Development (BDD)

Behavior-Driven Development

The BDD approach allows the development of software created from Test-Driven Development (TDD).

Helps to check the engineer's and client's points of view

Is written in plain English

Creates communication between technical and non-technical teams

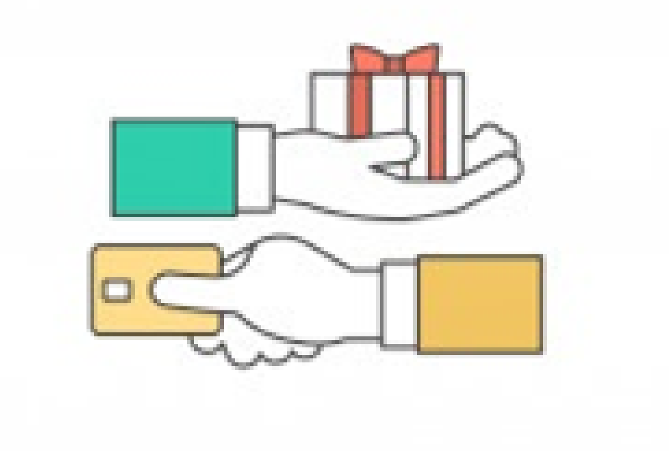
How BDD Works in Cucumber Automation?

Consider a scenario, where one wants to make a payment module in a food delivery application

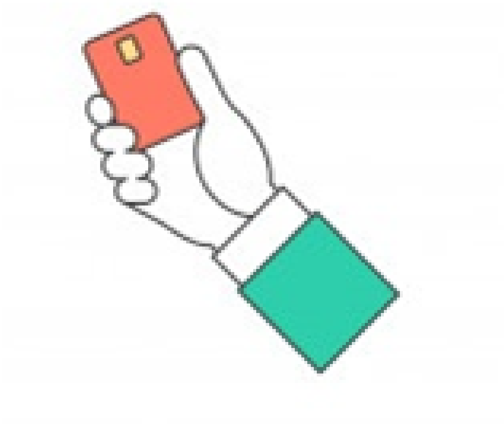
Break down the scenario that is involved in the payment process

Payment can be made through:

Bank account



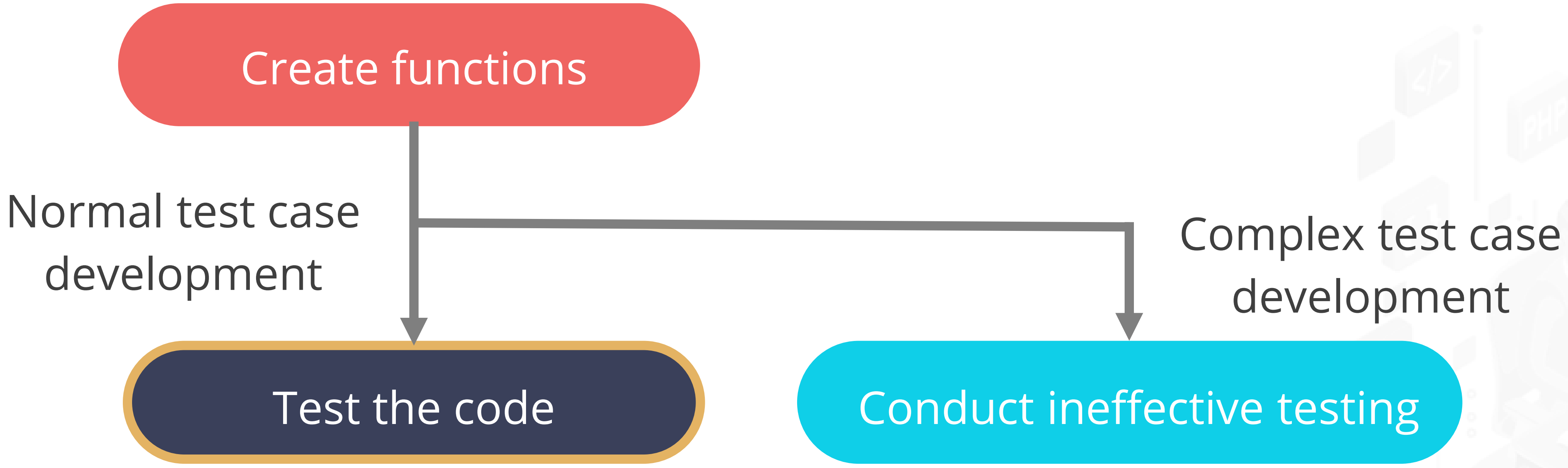
Cash on delivery or online payment



Net banking, UPI, credit, or debit Card

How BDD Works in Cucumber Automation?

Functions like paying an amount to another party and promo codes or discounts make test scenarios complicated.



Create functions
Normal test case development
Complex test case development
Test the code
Conduct ineffective testing

Cucumber BDD to be specific

Note

Cucumber BDD must fall within the steps Given-When-Then.

BDD: Example

Given that a payment module in food ordering application has been developed
And I am accessing it with proper login credentials for authentication

When I shall do the payment with enough amount in my bank account
Or I shall do payment with different modes of payment
Or I shall do a payment on UPI
And company’s payment interface is up
And transaction one-time password authentication for the payment transaction is correct
And press or click the pay button

Then amount must be transacted
And the event will be recorded in the log file

Characteristics of BDD

Characteristics of BDD

01 Ensures that there is a collaborative effort among stakeholders

02 Places a high value on business needs

03 Places a high value on commercial enterprise values and desires

04 Focuses on the needs of the business

05 Enables teams to be more confident

06 Reduces the cost of maintenance and the project risk

TECHNOLOGY

Feature File on Cucumber Testing

Feature File on Cucumber Testing

The feature file is one of the most important components of the cucumber tool. It is:

- ✓ Critical in producing a file that will pass all automation testing
- ✓ A standard file that stores the to-be-tested feature, scenario, and feature description
- ✓ A starting point to write cucumber tests
- ✓ A live document while testing

Feature File on Cucumber Testing

The feature file is one of the most important components of the cucumber tool. It is:

- ✓ An essential component of the cucumber device
- ✓ Needed to create files that are suitable for all automation testing
- ✓ Based on scenarios, characteristics, and descriptions of the tests
- ✓ Essential as a starting line for writing cucumber tests and live documents during testing

Note

The extension of the feature file is **.feature**.

Gherkin Language

Gherkin Language

Gherkin is a programming language used to create executable test scripts. It:

Describes business behavior

Provides a standard set of keywords in English text

Gherkin Language

Gherkin is a plain English text language used to interpret and execute test scripts.

Gherkin also supports other international and local languages, such as:

French

Finnish

Indonesian

Hungarian

Hindi

Urdu

Gujarati

Why Use Gherkin?

Read these statements and identify the most testable ones:

Statement 1

Customers are not allowed to enter invalid credit card information.

Direct without any test data

Statement 2

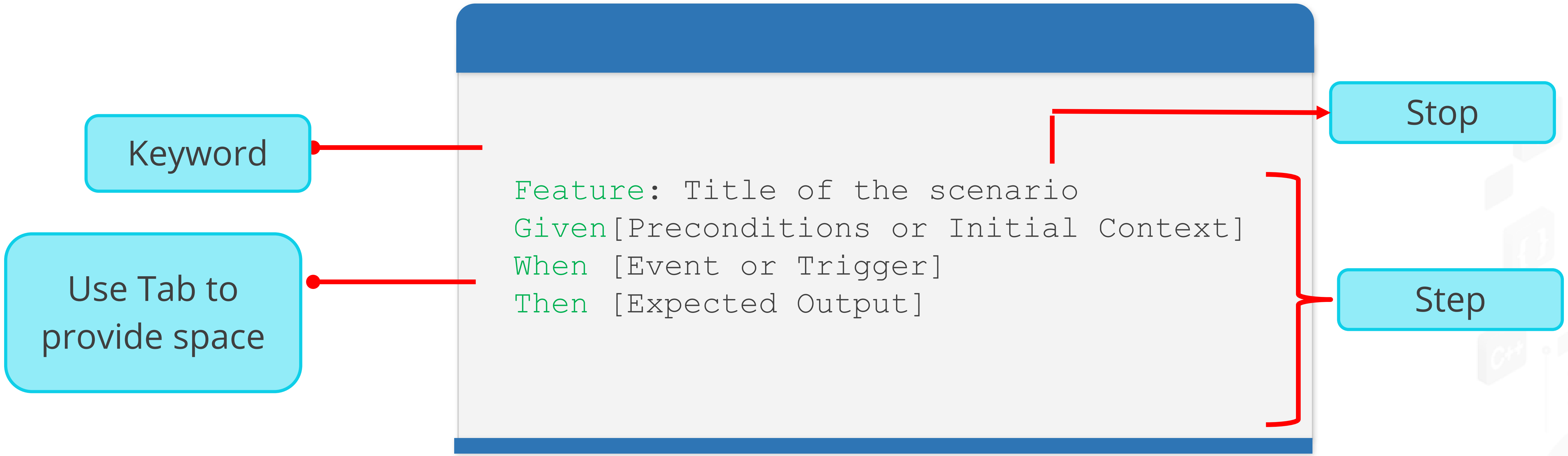
While submitting a form, if the customer enters that their credit card number is not exactly 16 digits long, it should show the correct number of digits error message.

Contains test data, and looks much more testable

Gherkin creates more specific requirements for a test case.

Gherkin Syntax

Gherkin is a line-oriented language, just like YAML and Python.



Keyword

Use Tab to provide space

Stop

Step

```
Feature: Title of the scenario
Given[Preconditions or Initial Context]
When [Event or Trigger]
Then [Expected Output]
```

A comment in a script must begin with a # sign.

To ensure that the software follows Gherkin’s syntax, Cucumber reads Gherkin and then runs a test.

Gherkin Terms

Gherkin Terms

Terms used in Gherkins are:

- Feature
- Given
- And
- Background
- When
- But
- Scenario
- Then
- Scenario Outline

Gherkin Terms

Terms used in Gherkins are:

Feature

The **feature** keyword starts with a Feature: followed by a space and the feature's name.

Background

With Background keywords, add some context to a scenario

Scenario

Multiple scenarios can be created in each feature file.
Every scenario begins with a Scenario: followed by its name.

Gherkin Terms

Given

Allows placing the system in a familiar state

Syntax:

Given–atest step that defines the ‘context

Given I am on “HomePage.

When

Defines the actions to be performed

Syntax:

A When – a test step that defines the ‘action’ performed

When I perform “Registration.”

Gherkin Terms

Then

Allows validating the outcome

Syntax:

Then – test step that defines the ‘outcome.’

Then I should see “Happy Birthday.”

But

Adds false conditions to the steps

Syntax:

A But – additional test step which defines the ‘action’ ‘outcome.’

But I should see “Happy Birthday.”

Gherkin Terms

And

Adds more conditions to the steps

Syntax:

And – additional test step which defines the ‘action’ performed

And I write   “CityName.” with “Newyork”

Scenario Outline

Identifies the parameter name symbols, "<" and ">”.

Given, When, Then, and, but are used interchangeably.

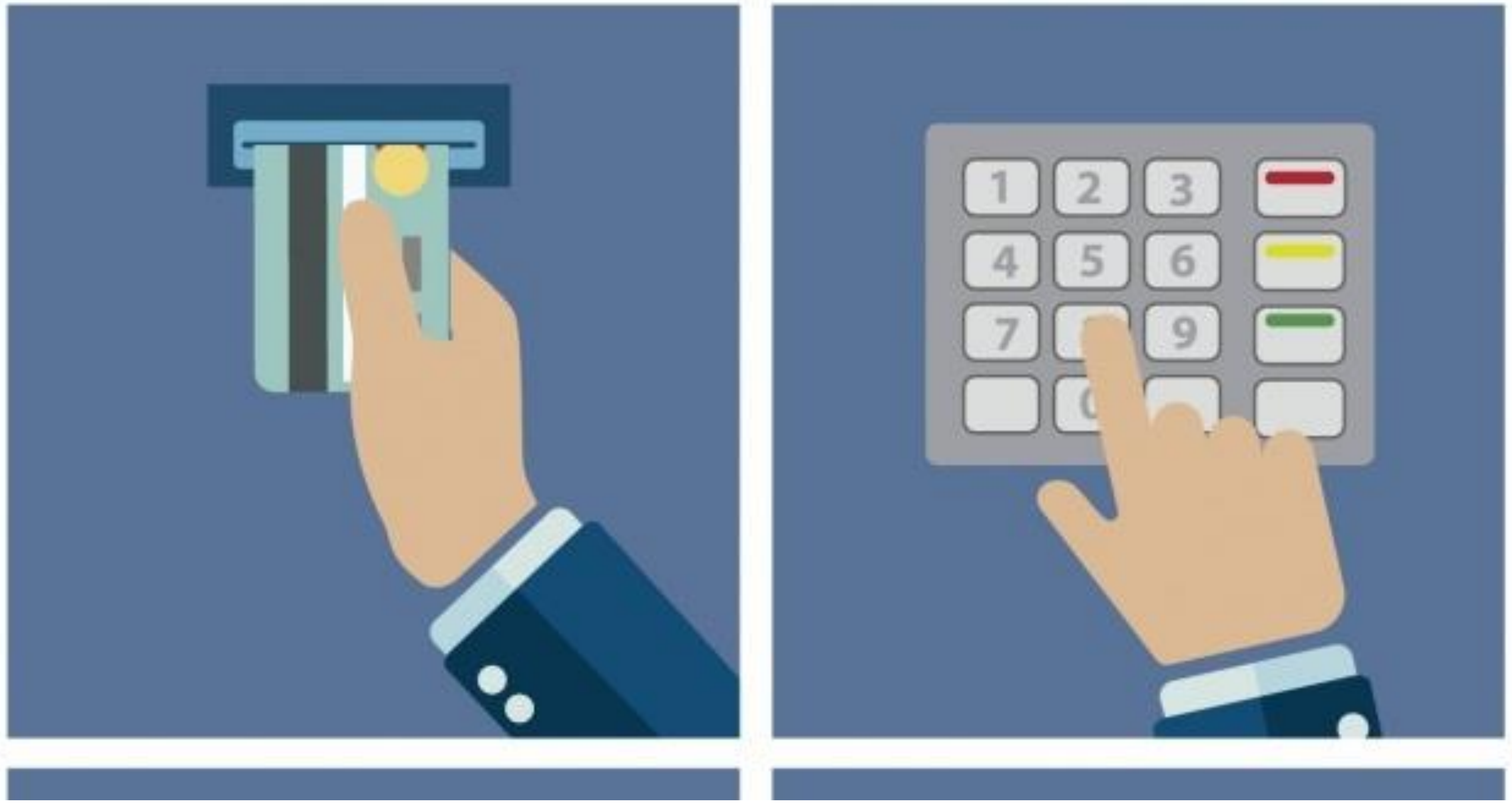
Gherkin Examples

Gherkin identifies every step written within the step definition document.

```
Feature: Login functionality of social network site Facebook
Given: I am a facebook user.
When: I enter username as username.
And: I enter the password as the password
Then: I should be redirected to the home page of facebook
```

Gherkin Scenario

While submitting a form, if the customer enters his ATM card pin that is not four digits long, it should show the correct number of digits error message.



Gherkin Scenario

The scenario is written in Cucumber using Gherkins terms as shown:

Feature: Message on entering invalid atm pin

Background
Given I have decided to withdraw some money
And I insert my debit card in atm
And I enter my debit card pin

Scenario
When I enter a pin number of fewer than four digits
And the other details are correct
And I submit the form
Then the form must be redisplayed
And I should see a notification informing me of the correct digits

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Best Practices of Using Gherkin

Best Practices of Using Gherkin

The best practices for using Gherkin are as follows:

- Each state of affairs needs to be executed one at a time.
- Every characteristic should be able to be completed alongside.
- Steps statistics should be proven independently.
- The scenarios should be connected with the requirements.

Best Practices of Using Gherkin

The best practices for using Gherkin are as follows:

- The whole track of scenarios should be covered in a demand report.
- Steps should be modular and smooth.
- All the common situations need to be executed.

TECHNOLOGY

Advantages and Disadvantages of Gherkin

Advantages of Gherkin

Simple language

Simplified user stories

Easy to understand

Meet business needs

Advantages of Gherkin

Use of
customer testimonies

Linking attractiveness
checks to
automated testing

Reuse of code
with easy
writing style

More accessible
examples

Disadvantages of Gherkin

Fails in
certain scenarios

High test-
maintenance costs

TECHNOLOGY

What Are Step Definitions?

Step Definitions

It is a small code that has an example attached to it or a Java technique in a class with an explanation.

1 It is connected by a comment followed by an example of the coordinates with steps.

2 Then, Cucumber executes the code when it encounters a Gherkin step.

3 Cucumber validates the Step definition report with the help of the Glue code.

Step Definitions

A Step definition is a Java method that includes an articulation that connects it to at least one Gherkin step.

Cucumber finds a coordinate with a step definition to execute a Gherkin step in a situation.

Step Definitions: Examples

Scenario: Some Food Items.
Given: I have 40 food items in my shopping basket.
The “I have 40 food items in my shopping basket” part of the step will match the following definition.

Using Java8 lambdas:

```
package com.example;
import io.cucumber.java8.En;
public class StepDefinitions implements En {
      public StepDefinitions() {
            Given("I have {int} food items in my shopping basket",
(Integer items) -> {
                System.out.format("Food Items: %n\n", items);
           });
      }
}
```

Installing Cucumber Eclipse Plugin

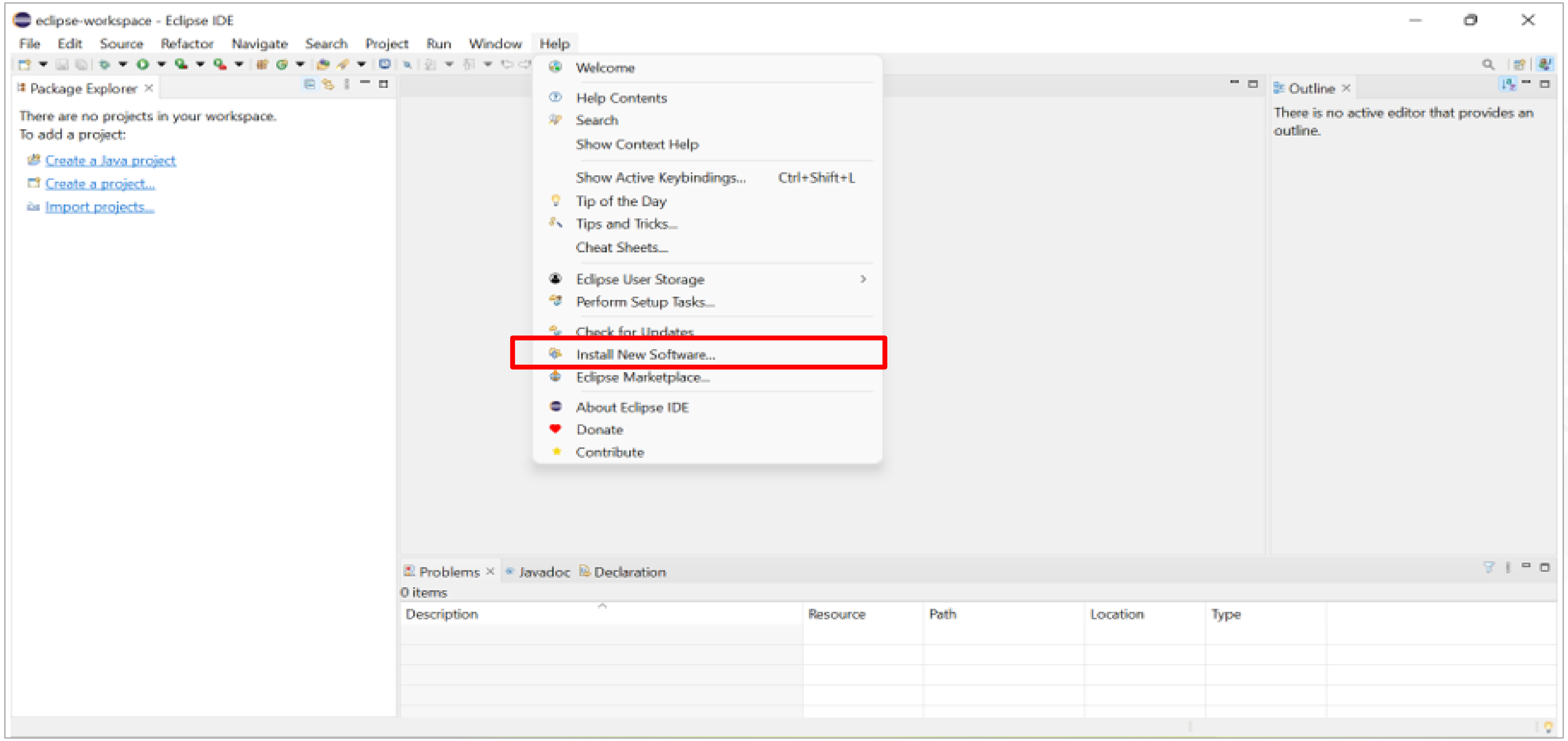
Installing Cucumber Eclipse Plugin

Cucumber eclipse plugin is available as a module for the Eclipse IDE.

Ensure the Internet connection is fully operational and Eclipse IDE is installed on the PC

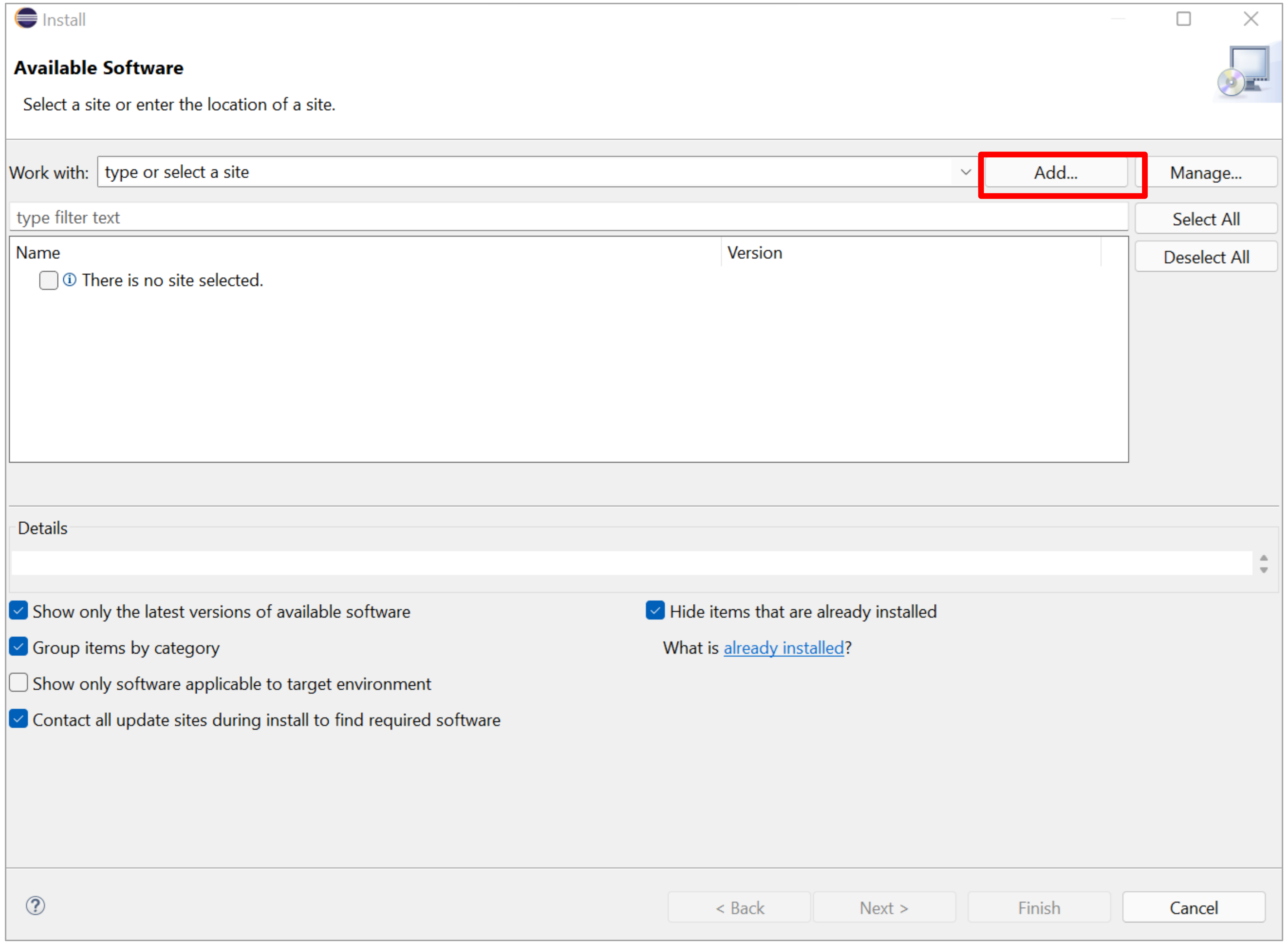
Installing Cucumber Eclipse Plugin

Step 1: Open the Eclipse IDE and click "Install New Software" from the Help menu



Installing Cucumber Eclipse Plugin

Step 2: A dialog window will open; click the "Add” button



Available Software

Select a site or enter the location of a site.

Work with: type or select a site

□ ⓘ There is no site selected.

☑ Show only the latest versions of available software

☑ Hide items that are already installed

☑ Group items by category

What is already installed?

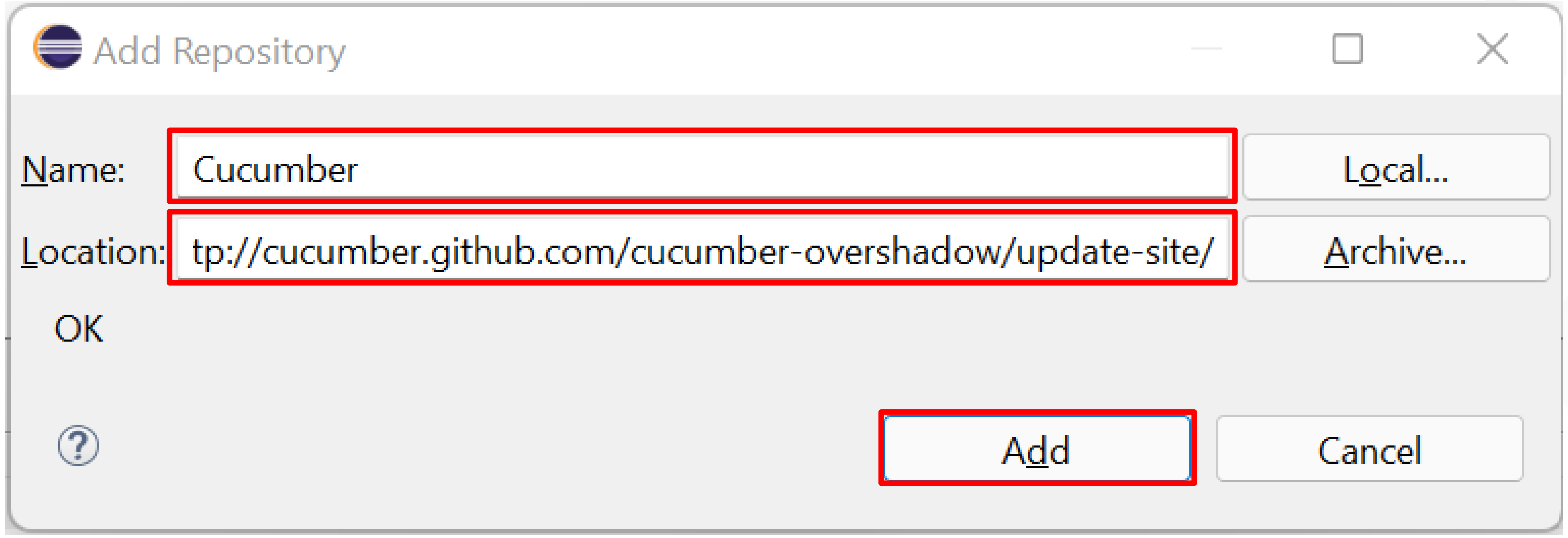
□ Show only software applicable to target environment

☑ Contact all update sites during install to find required software

Installing Cucumber Eclipse Plugin

Step 3: Give any name and type "http://cucumber.github.com/cucumber-overshadow/update-site" in the text box

Then, click OK



Add Repository

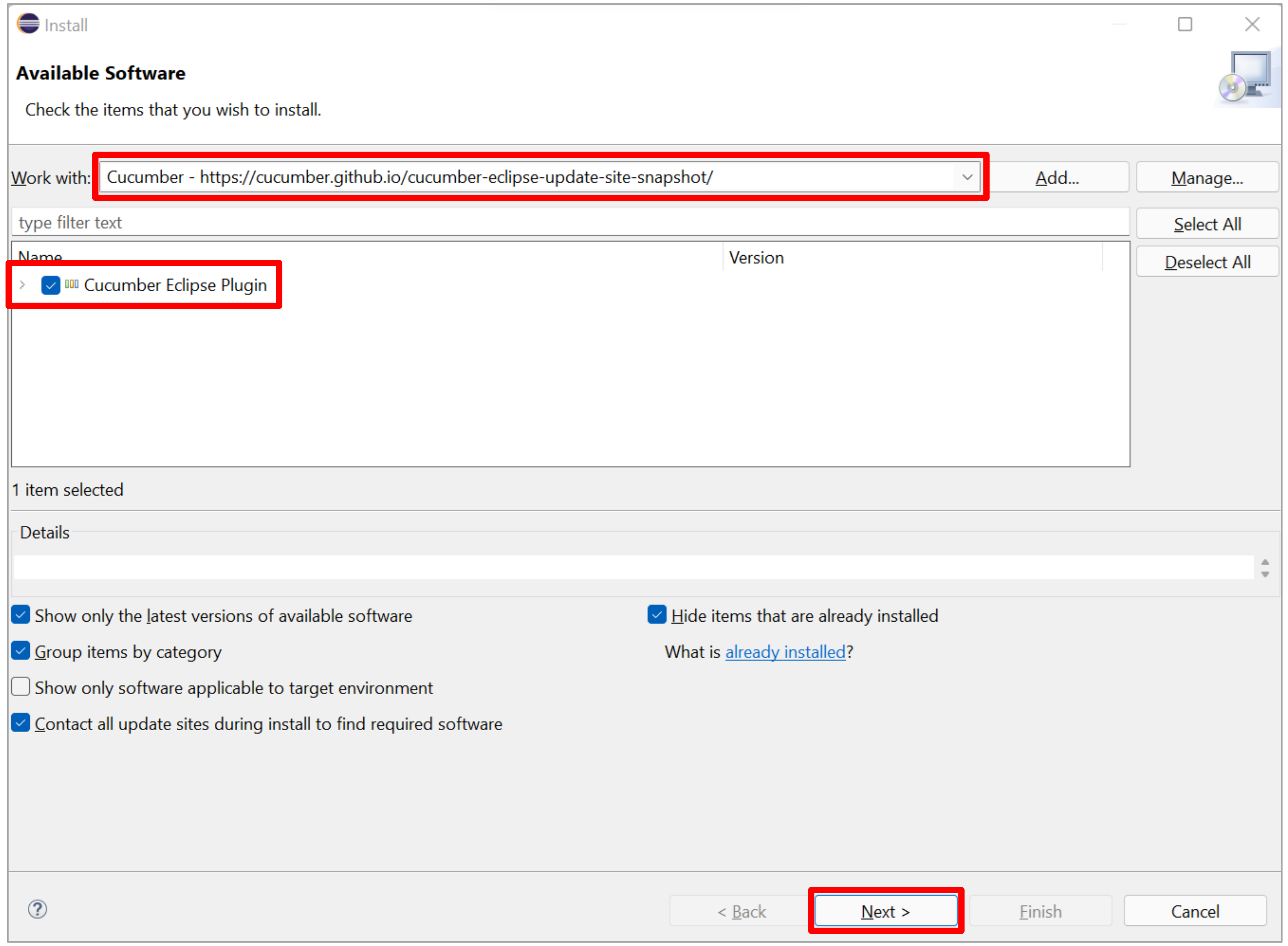
Name: Cucumber

Location: tp://cucumber.github.com/cucumber-overshadow/update-site/

OK

Installing Cucumber Eclipse Plugin

Step 4: The Cucumber Eclipse Plugin option in the available software list



Available Software

Check the items that you wish to install.

Work with: Cucumber - https://cucumber.github.io/cucumber-eclipse-update-site-snapshot/

☑ Cucumber Eclipse Plugin

1 item selected

☑ Show only the latest versions of available software

☑ Group items by category

□ Show only software applicable to target environment

☑ Contact all update sites during install to find required software

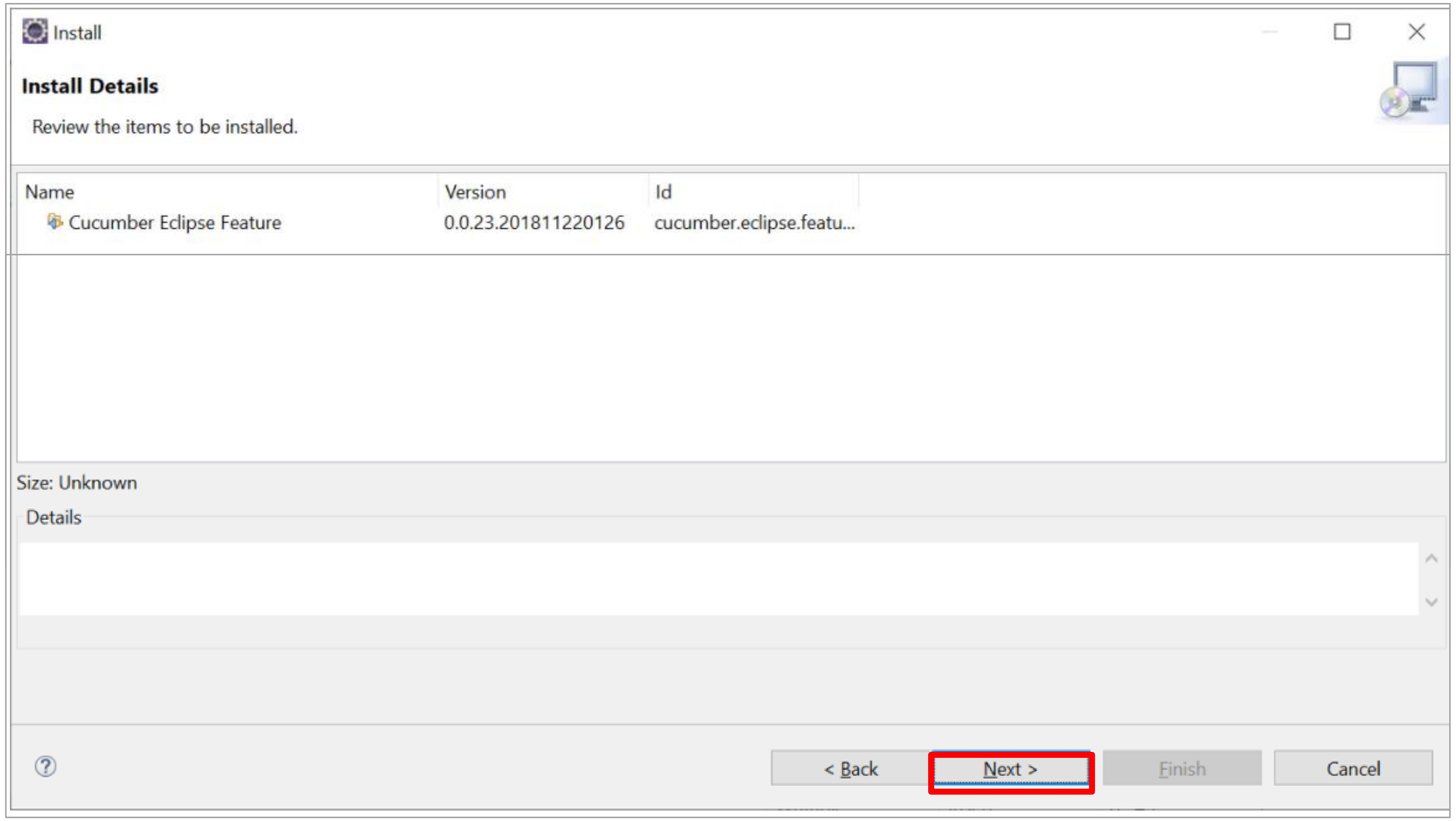
☑ Hide items that are already installed

What is already installed?

Check the box and then click the "Next" button

Installing Cucumber Eclipse Plugin

Step 5: Click Next



Install

Install Details

Review the items to be installed.

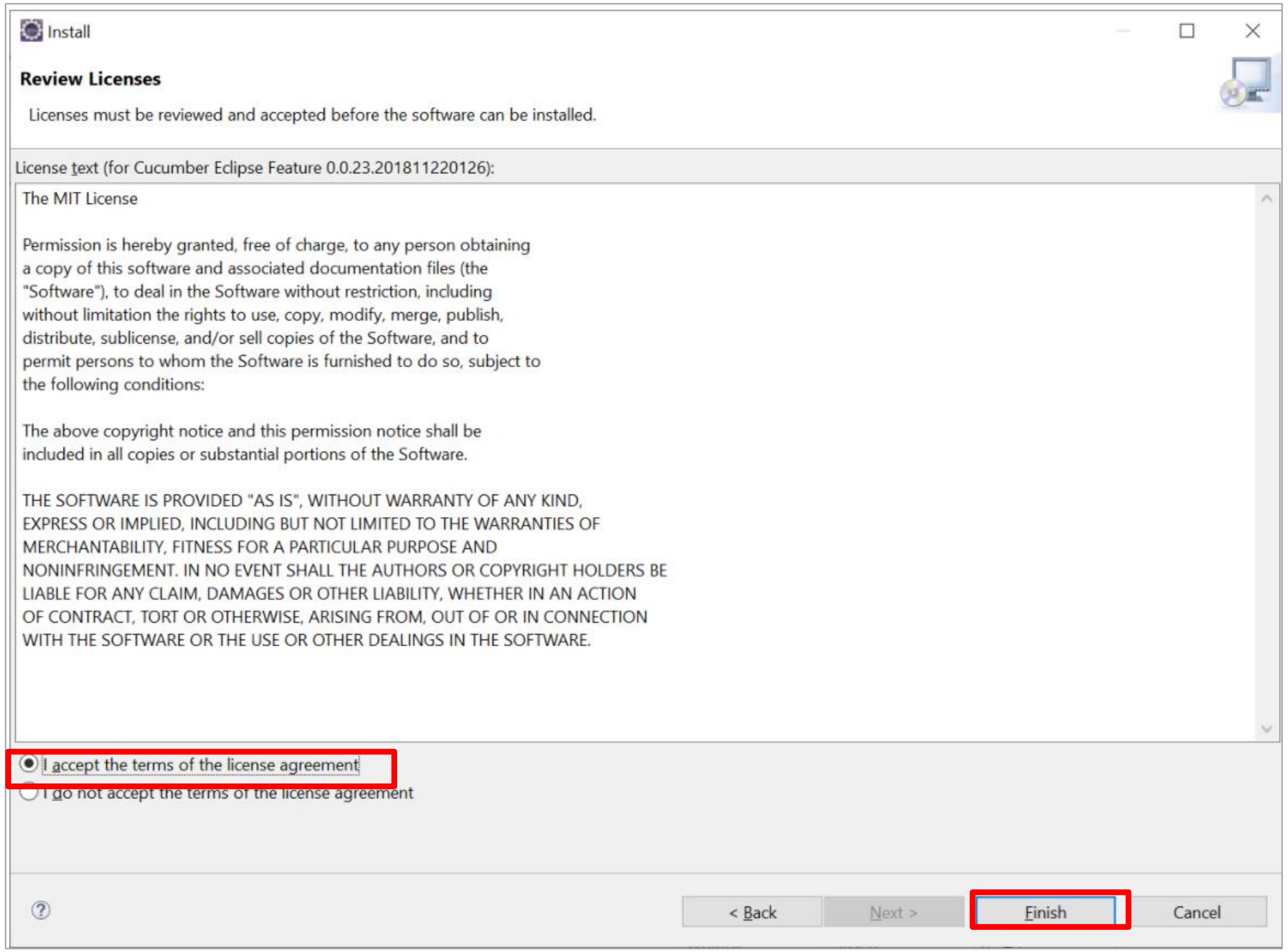
Name	Version	Id
Cucumber Eclipse Feature	0.0.23.201811220126	cucumber.eclipse.featu...

Size: Unknown

Details

Installing Cucumber Eclipse Plugin

Step 6: Accept the terms and click on “Finish”



Review Licenses

Licenses must be reviewed and accepted before the software can be installed.

License text (for Cucumber Eclipse Feature 0.0.23.201811220126):

The MIT License

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a copy of this software and associated documentation files (the
"Software"), to deal in the Software without restriction, including
without limitation the rights to use, copy, modify, merge, publish,
distribute, sublicense, and/or sell copies of the Software, and to
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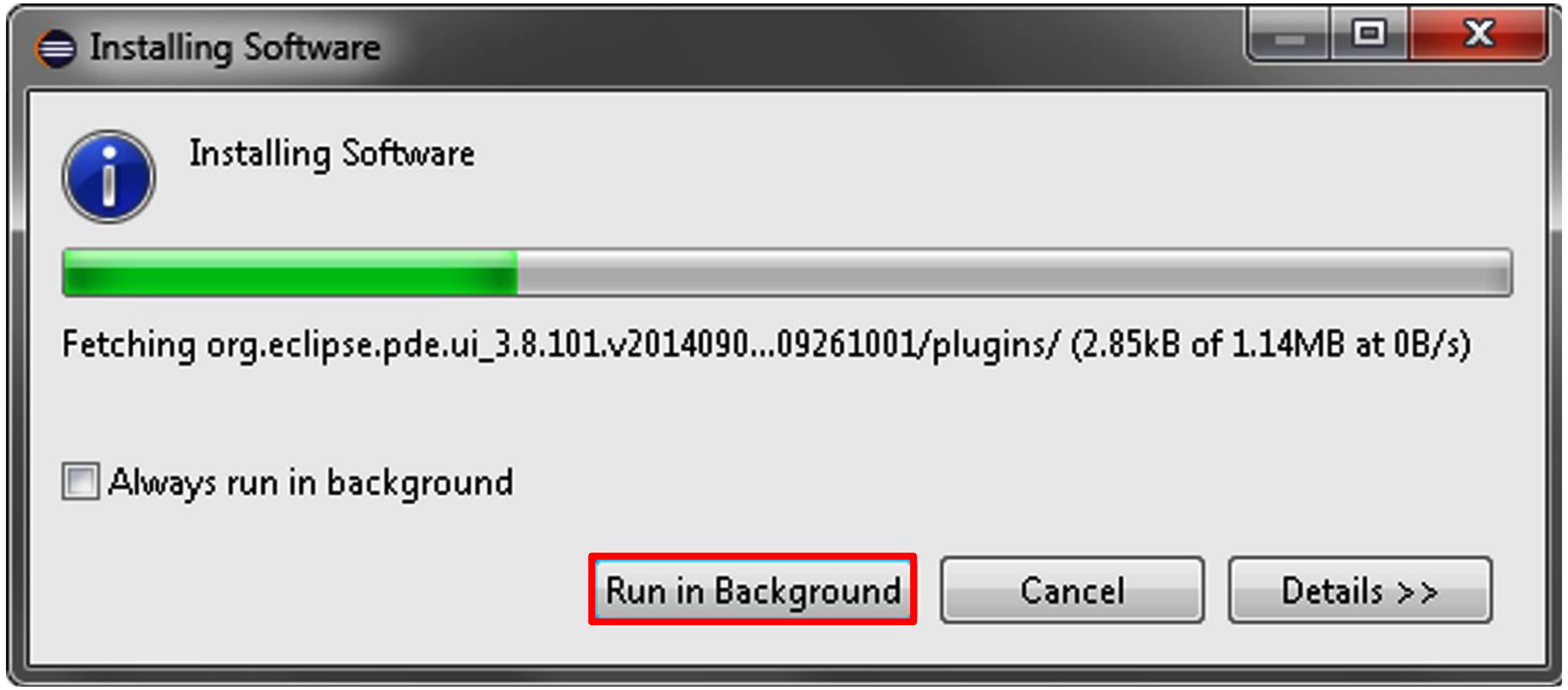
MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND
NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE
LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION
OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION
WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

● I accept the terms of the license agreement

○ I do not accept the terms of the license agreement

Installing Cucumber Eclipse Plugin

Step 7: Let it install



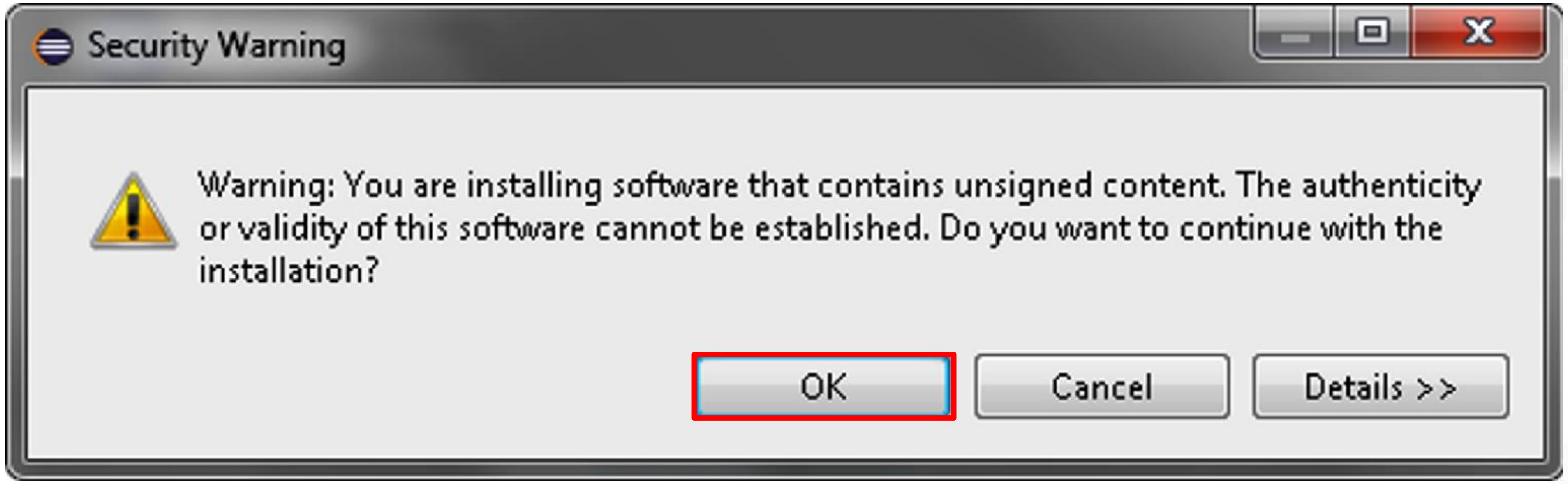
Installing Software

Fetching org.eclipse.pde.ui_3.8.101.v2014090...09261001/plugins/ (2.85kB of 1.14MB at 0B/s)

□ Always run in background

Installing Cucumber Eclipse Plugin

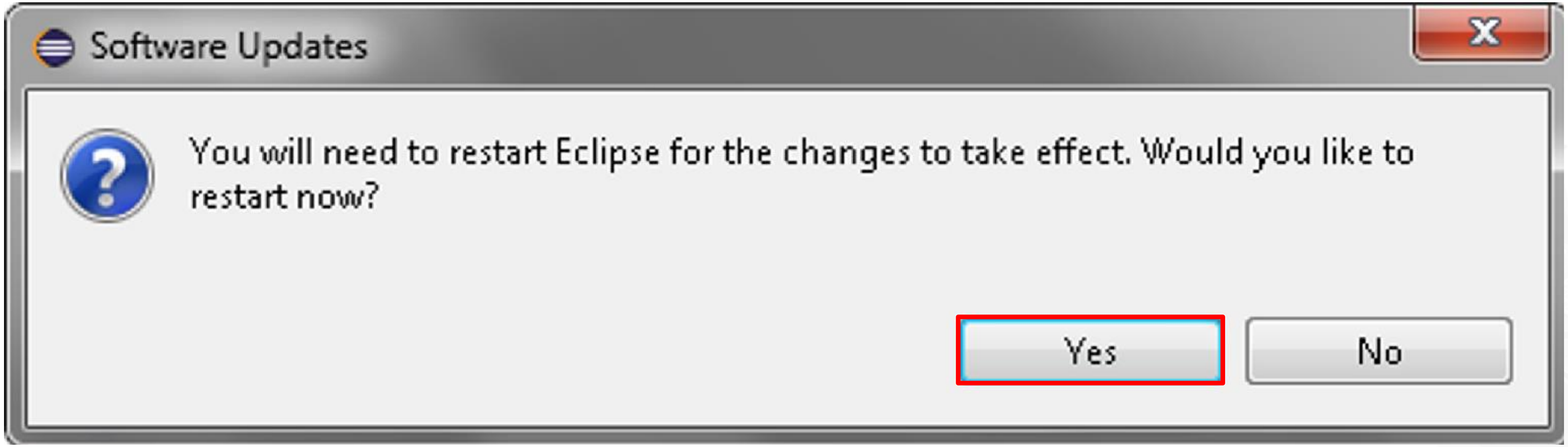
Step 8: If a security pop-up is displayed, click OK



Warning: You are installing software that contains unsigned content. The authenticity or validity of this software cannot be established. Do you want to continue with the installation?

Installing Cucumber Eclipse Plugin

Step 9: It is all set; click Yes



You will need to restart Eclipse for the changes to take effect. Would you like to restart now?

Key Takeaways

- The BDD approach allows the development of software created from Test-Driven Development (TDD).
- The feature file is one of the most important components of the cucumber tool.
- Gherkin is a plain English text language used to interpret and execute test scripts.
- Gherkin is a line-oriented language just like YAML and Python.
- A Step Definition is a Java method that includes an articulation that connects it to at least one Gherkin step.

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Thank You