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| BDD | BDD or behavior-driven development, in which an application is specified and designed by describing how it behaves. BDD offers the ability to enlarge the pool of input and feedback to include business stakeholders and end users like Scrum Master, Product Owner, Business Analyst etc., who may not even have software development knowledge. |
| Cucumber | Software tool based on Behavior Driven Development (BDD) framework which is used to write acceptance tests for the web application. The tests are written in easily readable and understandable format for Business Analysts, Developers and Testers. |
| Features of BDD | <p>Shifting from thinking in "tests" to thinking in "behavior"</p> <p>Collaboration between Business stakeholders, Business Analysts, QA Team and developers</p> <p>Driven by Business Value</p> <p>Extends Test-Driven Development (TDD) by utilizing natural language that non-technical stakeholders can understand</p> <p>BDD frameworks such as Cucumber or JBehave are an enabler, acting a "bridge" between Business & Technical Language</p> <p>BDD is popular and can be utilized for Unit level test cases and for UI level test cases.</p> |
| Feature | The Feature keyword's aim is to collect relevant scenarios and provide a high-level description of a software feature. |
| Scenario | The scenarios are written based on the expected behavior of the software and it is tested to check if it matches said scenarios. |
| Step | Each line in a scenario is called a step |
| Given | Describes the initial steps of pre-condition before the start of a test |
| When | Describes user actions during a test or steps performed |
| Then | Describes test results or outcome from When actions |
| And | Between any two statements, it gives the logical AND condition. AND can be combined with the GIVEN, WHEN, and THEN statements |
| But | It denotes a logical OR relationship between two propositions. OR can be combined with the GIVEN, WHEN, and THEN statements |
| Background | The Background section describes any common context to be established before each scenario. |
| Step Definitions | Cucumber scenarios become automated tests with the addition of what are called step definitions. A step definition is a block of code associated with one or more steps by a regular expression |
| Example | This is a practical illustration of a business rule. It comprises a series of steps. |
| Scenario Outline | The scenario outline is similar to scenario, with the exception that several inputs are provided. |
| tags | <p>Tags in cucumber provide a way to run scenarios in a specific sequence from a runner file. Each situation can be labeled with a useful tag. Later, in the runner file, user may specify which tag (and hence which scenario(s)) Cucumber should run. "@" is the first character in a tag. Any relevant content after "@" can be used to define your tag.</p> <p>Example - "@SmokeTest"</p> |

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| hooks | Hooks are code blocks that execute before or after each Cucumber scenario in the execution cycle. This enables us to better control the development workflow and decrease code redundancy. Setting up the web driver and terminating the web driver session resembles a test setup. The methods @Before and @After can be used to define hooks anywhere in the project or step definition layers. Before hook is executed before any other test situations, and after the hook is executed after all test scenarios have been completed. |
| Feature File | It has plain text descriptions of single or numerous test situations. Keywords like Then, When, Background, Scenario Outline, Feature, And, But, and so on are used in the tests. As a result, it's a file that keeps track of features and their descriptions. |
| Step Definition File | It essentially acts as a translator between the test scenario steps provided in the feature file and the automation code. Cucumber searches the step definition file and executes the relevant functions that are assigned to that step when it runs a step described in the feature file. |
| TestRunner | It connects the feature file and the step definition file. It allows the user to run one or more feature files at the same time. It contains the locations of the step definition and feature files |
| Prerequisite required for using Cucumber | <p>Step 1: Download and install the Java platform on user machine</p> <p>Step 2: Download and install Eclipse IDE</p> <p>Step 3: Download Cucumber Eclipse Plugin:</p> <ol style="list-style-type: none"> In the eclipse, navigate to Help > Install New Software. Copy the URL "http://cucumber.github.io/cucumber-eclipse/update-site/" and press Enter. User would see a checkbox named "Cucumber Eclipse Plugin", Select the checkbox 'Cucumber Eclipse Plugin'. Click 'Next' Again click 'Next' and Accept the license terms. Click Finish Click 'Install anyway' Click 'Restart Now' <p>Step 4: Create a Maven Project in Eclipse</p> <p>Step 5: Open the pom.xml file in eclipse and the below dependency after navigating to Maven Repository "https://mvnrepository.com/"</p> <ol style="list-style-type: none"> cucumber-java cucumber-core cucumber-junit |

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| Cucumber Maven Dependency | <pre> <dependency> <groupId>io.cucumber</groupId> <artifactId>cucumber-core</artifactId> <version>7.0.0</version> </dependency> <dependency> <groupId>io.cucumber</groupId> <artifactId>cucumber-java</artifactId> <version>7.0.0</version> </dependency> <dependency> <groupId>io.cucumber</groupId> <artifactId>cucumber-junit</artifactId> <version>7.0.0</version> <scope>test</scope> </dependency> </pre> |
| Sample Feature File | <p>Feature: Search in Google Home Page</p> <p>Scenario: Search Cucumber Tutorial</p> <p>Given Google Page open And Search Text Box should be present in the Google Home Page When User Search a Course with keyword Cucumber Tutorial And Hit Enter Button Then All Courses related to Cucumber Tutorial should be displayed</p> |
| Sample Step Definitions Class | <pre> public class GoogleSearchEngine { @Given("Google Page open") public void google_page_open() { } @Given("Search Text Box should be present in the Google Home Page") public void search_text_box_should_be_present_in_the_google_home_page() { } @When("User Search a Course with keyword Cucumber Tutorial") public void user_search_a_course_with_keyword_cucumber_tutorial() { } @When("Hit Enter Button") public void hit_enter_button() { } @Then("All Courses related to Cucumber Tutorial should be displayed") public void all_courses_related_to_cucumber_tutorial_should_be_displayed() { } } </pre> |

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| Sample Runner Class | @RunWith(Cucumber.class) @CucumberOptions(features = ("src/test/java/Features"), glue = ("StepDefinitions"), plugin = ("pretty"), monochrome = true) public class Runner { } |
| Sample Cucumber Hooks | @Before Hook: It will execute before every scenario. Example @Before public void setUp() { System.out.println("Starting the test"); } @After Hook: It will execute after every scenario. @After Public void tearDown () { System.out.println("Closing the test"); } |
| Sample Scenario Outline Example | Feature: Facebook Login Scenario Outline: To check the login functionality for the facebook site Given User Navigates to the Facebook Login Page When User Enter <username> as UserName and <password> as Password Then Login should be <status> for Facebook Examples: username password status username1 password1 Successful username1 password2 Unsuccessful username2 password3 Unsuccessful |
| Sample Cucumber Tags and Background | Feature: Search in Google Home Page Background: Given Google Home Page Open And Search Text Box is visible and Enabled @Smoke @Regression Scenario: Search Cucumber Tutorial in Google Home Page When User Search a Course with Keyword Cucumber Tutorial And Hit Enter Then All Courses related to Cucumber Tutorial should be displayed @Regression @Integration Scenario: Search Java Tutorial in Google Home Page When User Search a Course with Keyword Java Tutorial And Hit Enter Then All Courses related to Java Tutorial should be displayed |

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| <p>Sample Runner Class to accommodate tags</p> | <pre> @RunWith(Cucumber.class) @cucumberOptions(features = ("src/test/java/Features"), glue = ("StepDefinitions"), //tags = ("@Integration"), //tags = ("not @Integration"), tags = ("@Integration or @UAT"), //tags = ("@Integration and @Regression"), publish = true, plugin = ("pretty"), monochrome = true) public class Runner { </pre> |
| <p>Sample Runner Class to accommodate reports</p> | <pre> @RunWith(Cucumber.class) @cucumberOptions(features = ("src/test/java/Features"), glue = ("StepDefinitions"), tags = ("@UAT"), publish = true, plugin = ("pretty"), //plugin = {"pretty", "html:target/html-reports/report.html", "junit:target/junit- reports/", "junit:target/xml-reports/report.xml", "json:target/json- reports/report.json"}, //plugin = {"pretty", "html:target/html-reports/report.html"}, monochrome = true) public class Runner { </pre> |