DevOps Certification Training

TECHNOLOGY

Software and Automation Testing Framework

simplilearn

Learning Objectives

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

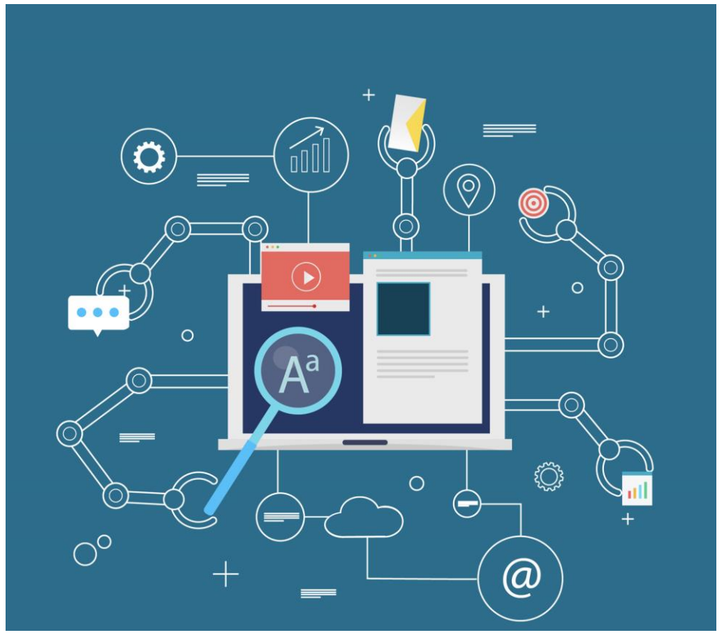
- Describe the automation testing process
- Describe the Selenium WebDriver architecture
- Install Selenium WebDriver, and write the first test case
- Implement TestNG in Eclipse
- Implement continuous integration with Selenium and Jenkins

TECHNOLOGY

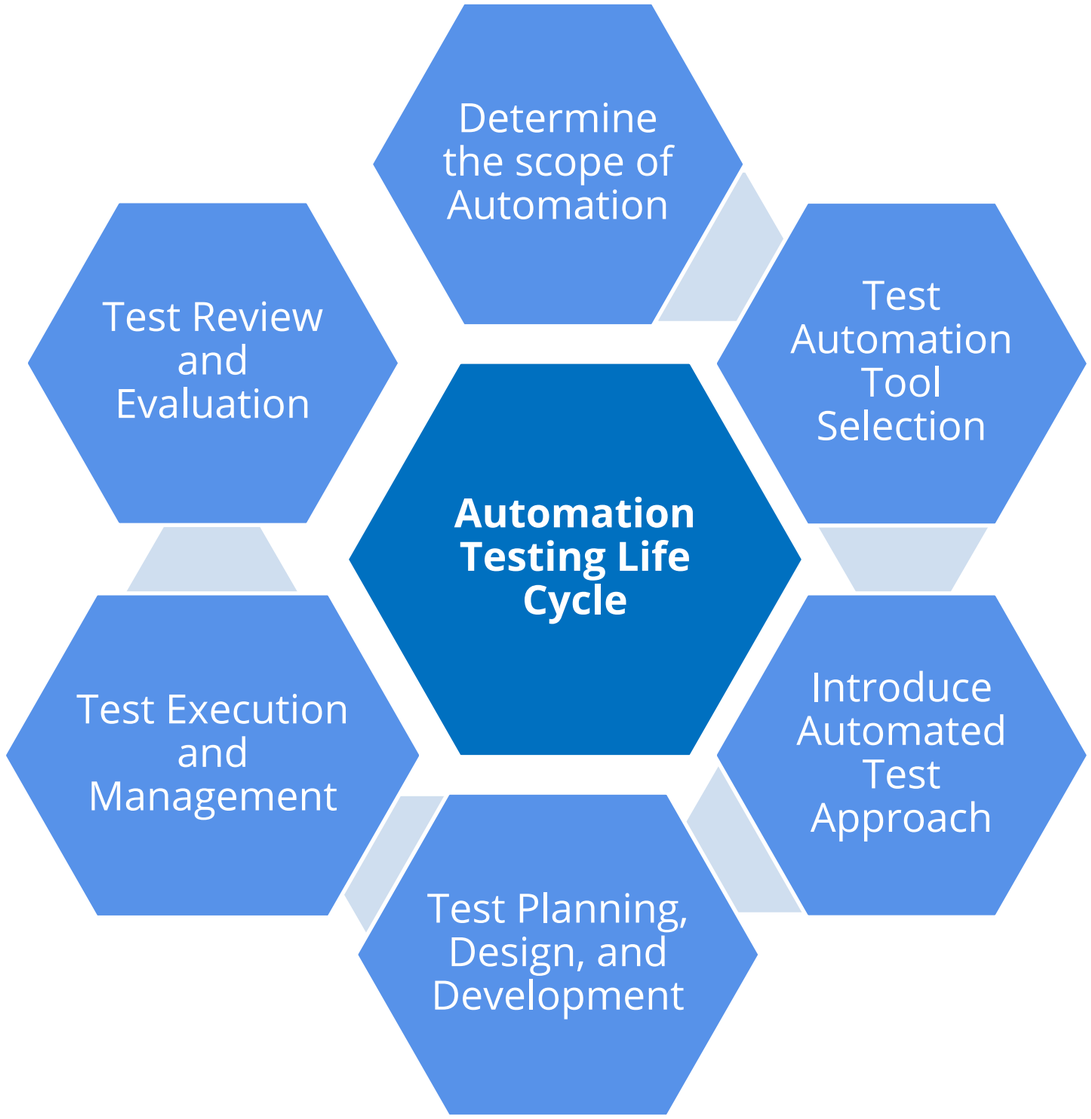
Introduction to Automation Testing

What Is Automation Testing?

Automation testing is a method in software testing that uses special software tools to control the execution of tests and compares the actual test results with the expected results. It requires very less human intervention.



Automation Testing Process



What Is Selenium?

- It is open-source, portable framework used to automate web applications testing.
- It is highly flexible when it comes to testing functional and regression test cases.
- It also supports cross browsing, where the test cases run across various platforms simultaneously.
- It also helps in creating robust, browser-based regression automation suites and perform test case execution.

Why Selenium?

Browsers

Programming Languages

OS Platforms

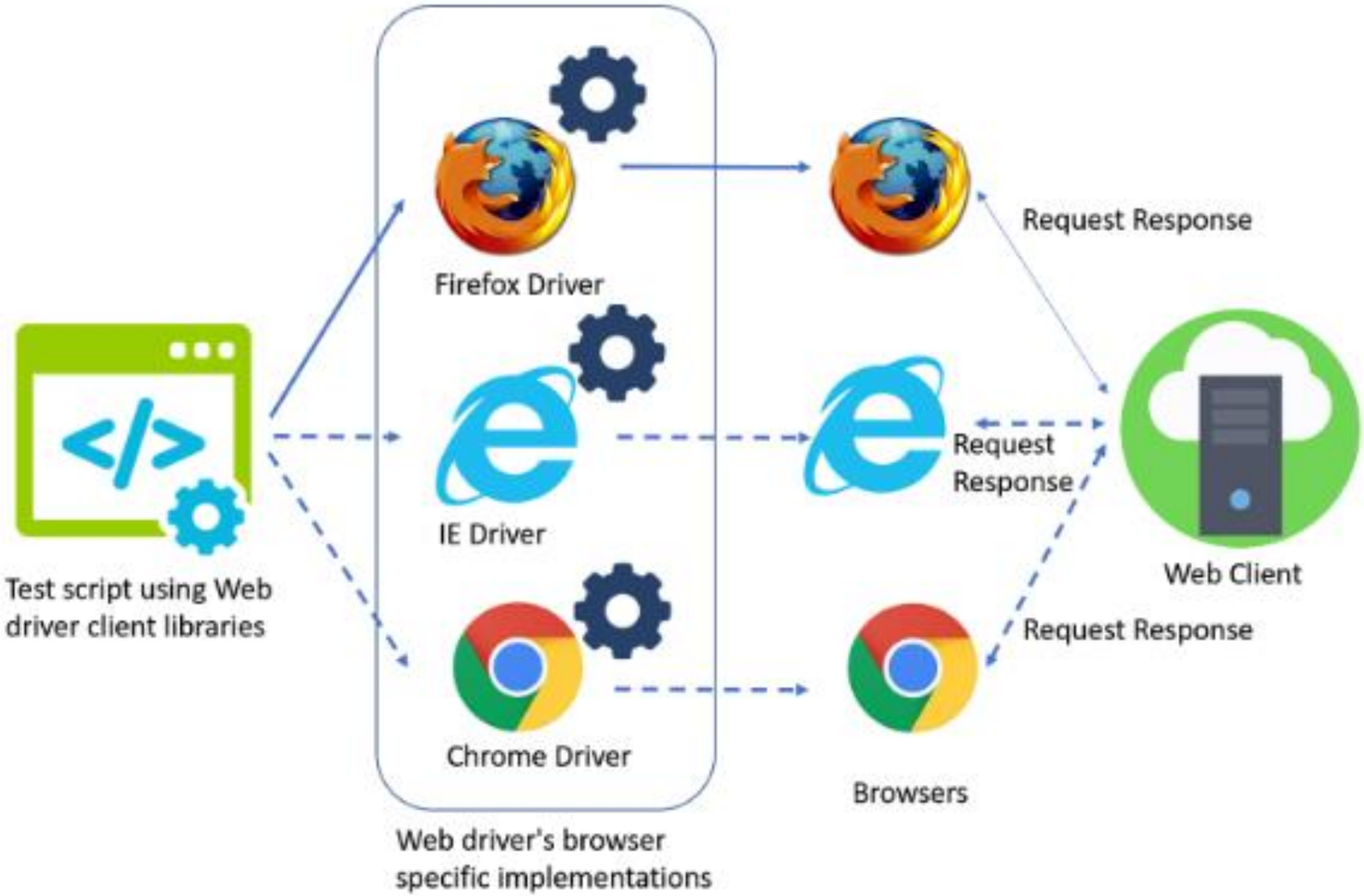
Advantages of Selenium

- Language and Framework Support
- Multi-Browser Support
- Ease of Implementation
- Parallel Test Execution and Fast Speed
- Less Hardware Usage and Constant Updates

TECHNOLOGY

Selenium Architecture and its Components

Selenium WebDriver Architecture



Selenium Components

- Selenium IDE
- Selenium RC
- Selenium WebDriver
- Selenium Grid

Selenium IDE

- IDE (Integrated Development Environment) is a Firefox plugin and is one of the simplest frameworks in the Selenium Suite.
- It allows us to record and playback the scripts.
- If you wish to create scripts using Selenium the IDE, you should use Selenium RC or Selenium WebDriver to write advanced and robust test cases.

Selenium RC

- Also known as Selenium 1.
- Main Selenium project for a long time before the WebDriver merge brought up Selenium 2.
- Relies on JavaScript for automation.
- Supports Ruby, PHP, Python, Perl, C#, Java, Javascript. It supports all the browsers currently available.
- RC is now officially deprecated.

Selenium WebDriver

- It is a browser automation framework that accepts commands and sends them to a browser.
- Implemented through a browser-specific driver.
- Communicates with the browser and controls it.
- Supports various programming languages like – Java, C#, PHP, Python, Perl, Ruby, and Javascript.

Selenium Grid

- It is a tool which is used together with Selenium RC.
- It is used to run tests on different systems against different browsers in parallel.
- Which implies – running multiple tests at the same time against different systems running different browsers and operating systems.

Prerequisites for Selenium

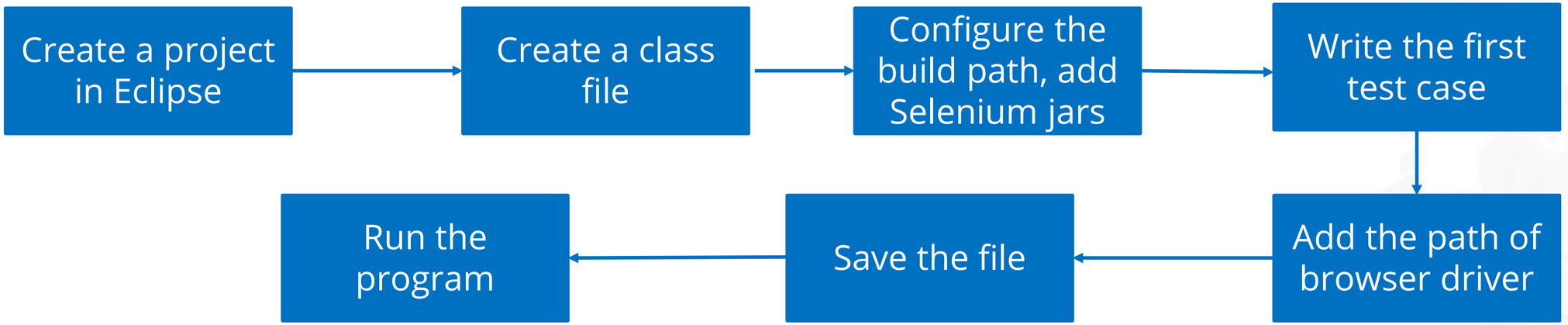
Java 1.8 and above or Python

Eclipse for JEE developers

Selenium 3.0

Browser Drivers

Write the First Test Case



Selenium WebDriver Installation and Integration in Eclipse

Duration: 15 Min.

Problem Statement:

You have been asked to install and integrate Selenium WebDriver.

ASSISTED PRACTICE

Assisted Practice: Guidelines

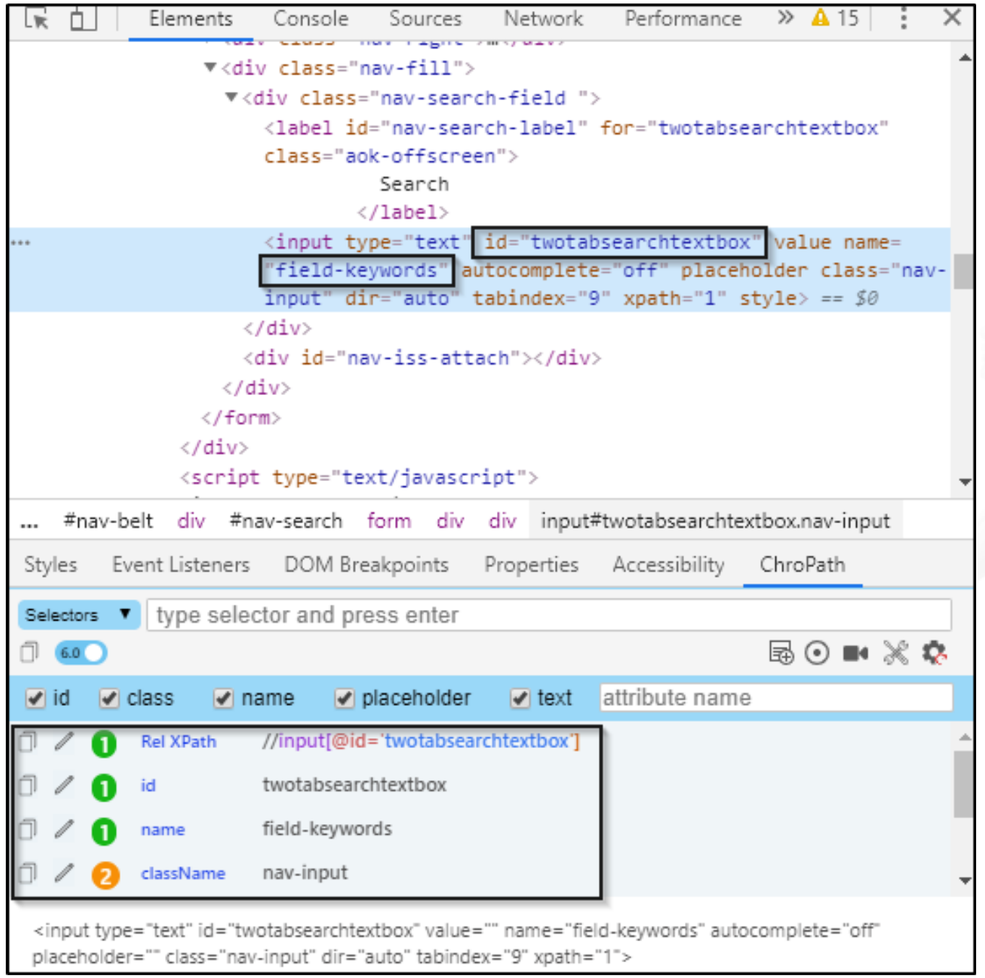
Steps to Perform:

1. Download and setup Selenium server
2. Downloading ChromeDriver
3. Integrating selenium to Eclipse

What Is A Web Element?

- Anything that is present on the web page is a WebElement such as text box, button, etc. It represents an HTML element.

- Selenium WebDriver encapsulates a simple form element as an object of the WebElement



Running the First Selenium Test Case

Duration: 15 Min.

Problem Statement:

You have been asked to execute a first test case in Selenium.

ASSISTED PRACTICE

Assisted Practice: Guidelines

Steps to Perform:

1. Configure Selenium in Eclipse
2. Run the first test case

TECHNOLOGY

Selenium TestNG Framework

Introduction to TestNG

- **TestNG** stands for ***Test Next Generation*** and is an open-source test automation framework, inspired by JUnit and NUnit.
- It provides functionality like test annotations, grouping, prioritization, parameterization, and sequencing techniques in the code
- It provides detailed test reports.

Features of TestNG

- It generates the report in a format that includes several executed test cases, number of failed test cases, and test cases that have been skipped.
- Multiple test cases can be grouped easily by converting them into a TestNG.xml file. Here, you can set the priorities to execute the test cases.
- Using TestNG, you can execute multiple test cases on multiple browsers.
- The testing framework can be easily integrated with tools like Maven, Jenkins, etc.

Setting Up TestNG in Eclipse

Duration: 15 Min.

Problem Statement:

You have been asked to setup and configure TestNG framework on your system.

ASSISTED PRACTICE

Assisted Practice: Guidelines

Steps to Perform:

1. Download and set up TestNG
2. Integrate TestNG in Eclipse

Testing the Automation Script

Duration: 15 Min.

Problem Statement:

You have been asked to test the automation script using TestNG.

ASSISTED PRACTICE

Assisted Practice: Guidelines

Steps to Perform:

1. Configure TestNG in Eclipse
2. Test the automation script

Selenium Integration with Jenkins

Why Jenkins for Test Automation?

Jenkins is a popular Continuous Integration orchestration tool. It provides numerous plugins for integration with multiple test automation tools and frameworks into the test pipeline. When it comes to test automation, Jenkins provides plugins that help run test suites, gather and display the results, and provide details on failed test cases.

Jenkins

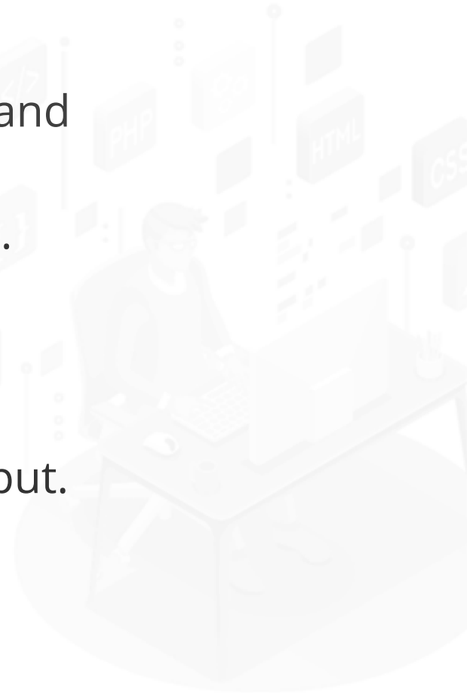
Why Jenkins for Test Automation?

Runs Automated Test Suites:

- Jenkins provides plugins for various test frameworks like Selenium, Cucumber, and Appium, Robot framework.
- These can be integrated into CI pipelines to run automated tests for every build.

Summarizes the results:

- Most plugins also summarize the test results and display them as an HTML output.



Why Jenkins for Test Automation?

Provides Trends

Jenkins keeps track of results and displays them as a trend graph. This offers a better view of how the tests have fared in the past.

Displays Test Failure Results

Test results are tabulated, and the failures are logged with the test results.

Adding Selenium Plugin to Jenkins

Duration: 15 Min.

Problem Statement:

You have been asked to add the selenium plugin to Jenkins tool.

ASSISTED PRACTICE

Assisted Practice: Guidelines

Steps to Perform:

1. Login to Jenkins Dashboard
2. Add Selenium plugin to Jenkins

Key Takeaways

- Selenium is a testing tool for automation testing of web applications.
- Selenium supports various programming languages, operating, system and browsers
- TestNG generates the report in a format that includes several executed test cases, number of failed test cases, and test cases that have been skipped.
- Jenkins provides numerous plugins for integration with multiple test automation tools and frameworks into the test pipeline.

Lesson-End Project

Continuous Integration with Selenium in Jenkins

Project Agenda: As a DevOps engineer, you are required to perform continuous integration with Selenium and TestNG in Jenkins.

Description: Testing is an integral part of SDLC and Agile. It is necessary to test every tool before getting into production environment to ensure that the tool functions as desired. To do so, it is necessary to integrate a tool with Jenkins in DevOps life cycle.

LESSON-END PROJECT