AUTOMATED SOFTWARE TESTING
(502072)

Lab 3 – Selenium Library
Prepared by Nguyen Thanh Quan (MSc)

1. **GOALS:** This lab helps students to
   - Practise automation testing of web applications using.
   - Be able to write test cases with Selenium Library – Robot Framework.
   - Understand various functionalities of Selenium Library.
   - Be able to work with various web elements.
2. **OBJECTIVES**
   - Install automated testing environment with Selenium/Robot Framework.
   - Install web drivers.
   - Write and execute test cases.
   - Work with web elements (textbox, checkbox, button,…).
   - Navigation.
3. **CONTENT**

3.1 PREREQUISITES

To practise complete this assignment, students must prepare to install the following libraries and packages. More importantly, students should have a basic understanding of testing concepts.

- Python
  Go to python official site – https://www.python.org/downloads/ and download the latest version or the prior version of python as per your operating system.
  Remember to set PATH correctly to use Python after installation.

- Pip
  PIP gets installed along with python. Run **`*pip --version*`** to check pip version

- Robot Framework
  Use pip – python package manager to install the robot framework and the command for it is as follows

  `pip install robotframework`
  `robot --version` to check robot framework version.

- wxPython for Ride IDE
  wxPython is needed for Robot Framework Ride, which is an IDE for Robot Framework.

  Windows:
  https://sourceforge.net/projects/wxpython/files/wxPython/2.8.12.1/

  Linux: Install wxPython with the package manager of OS.

- Selenium library (https://github.com/robotframework/SeleniumLibrary/)
  `pip install --upgrade robotframework-seleniumlibrary`

- Selenium webdriver
  (https://www.selenium.dev/documentation/webdriver/)
  `pip install --upgrade robotframework-seleniumlibrary`

- Robot Framework Ride
  Use pip command to install Ride IDE.

  `pip install robotframework-ride`.

To open Ride IDE, run ***`ride.py`***

3.2 INTRODUCTION TO SELENIUM

Selenium is an open-source, automated testing tool used to test web applications across various browsers. Selenium can test web applications against various browsers like Firefox, Chrome, Opera, and Safari, and these tests can be coded in several programming languages like Java, Python, Perl, PHP, and Ruby.

It is platform-independent, meaning it can deploy on Windows, Linux, and MacOS, and can be integrated with tools like JUnit and TestNG for test management.

Advantages of Selenium Testing

1. Selenium has proven to be accurate with results thus making it extremely reliable.
2. Since selenium is open-source, anybody willing to learn testing can begin at no cost.
3. Selenium supports a broad spectrum of programming languages like Python, PHP, Perl, and Ruby.
4. Selenium supports various browsers like Chrome, Firefox, and Opera, among others.
5. Selenium is easy to implement and doesn't require the engineer to have in-depth knowledge of the tool.
6. Selenium has plenty of re-usability and add-ons.

Limitations of Selenium Testing

1. Since Selenium is open-source, it doesn't have a developer community and hence doesn't have a reliable tech support.
2. Selenium cannot test mobile or desktop applications.
3. Selenium offers limited support for image testing.
4. Selenium has limited support for test management. Selenium is often integrated with tools like JUnit and TestNG for this purpose.
5. You may need knowledge of programming languages to use Selenium.

Selenium Webdriver

Selenium WebDriver was the first cross-platform testing framework that could configure and control the browsers on the OS level. It served as a programming interface to create and run test cases.

WebDriver performs actions on web elements. It supports various programming languages like Java, C#, PHP, Python, among others. It can also be integrated with frameworks like TestNG and JUnit for test management.

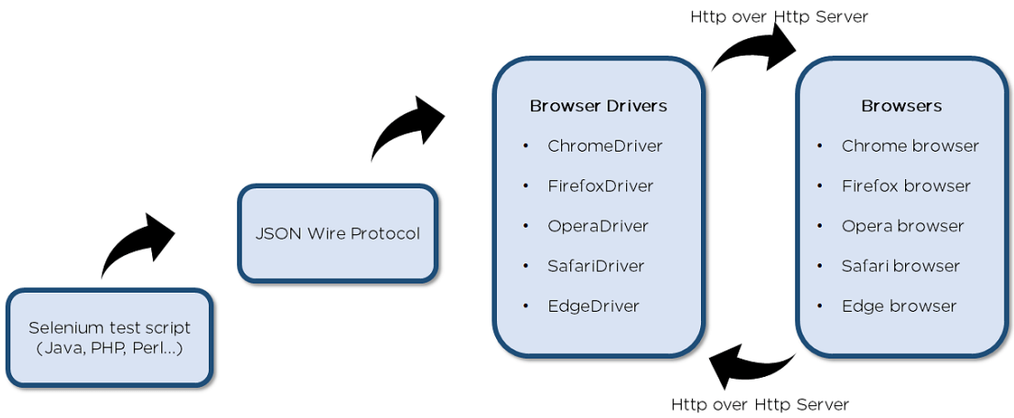


Figure 1 - Selenium WebDriver Architecture

- Selenium test script - Selenium test script is the test code written in any of the mentioned programming languages that are interpreted by the driver
- JSON Wire Protocol - JSON Wire Protocol provides a transport mechanism to transfer data between a server and a client. JSON Wire Protocol is the industry standard for various web services
- Browser drivers - Selenium uses drivers, specific to each browser to establish a secure connection with the browser
- Browsers - Selenium WebDriver supports multiple web browsers to test and run applications on.

3.3 EMBED SELENIUM LIBRARY INTO ROBOT FRAMEWORK

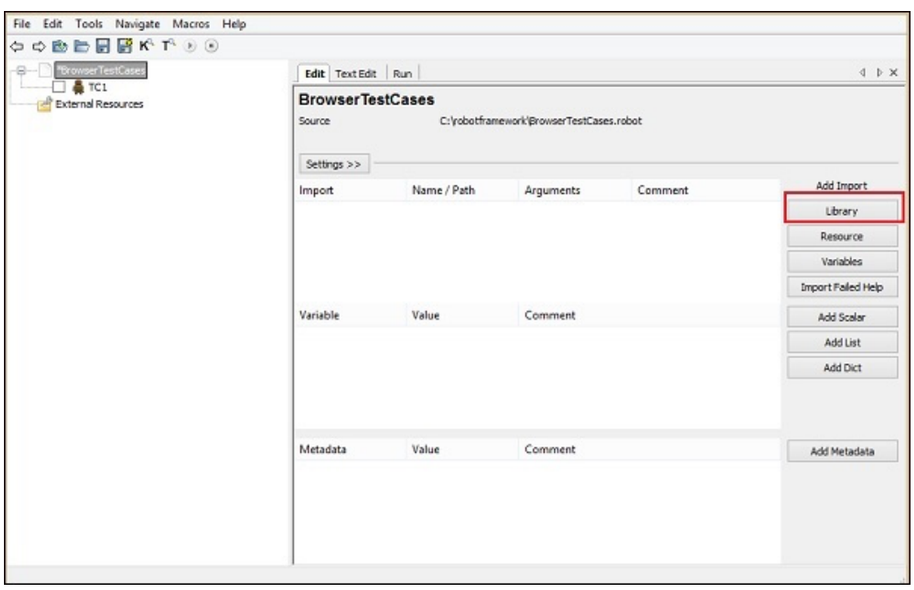


Figure 2 – Add a new library

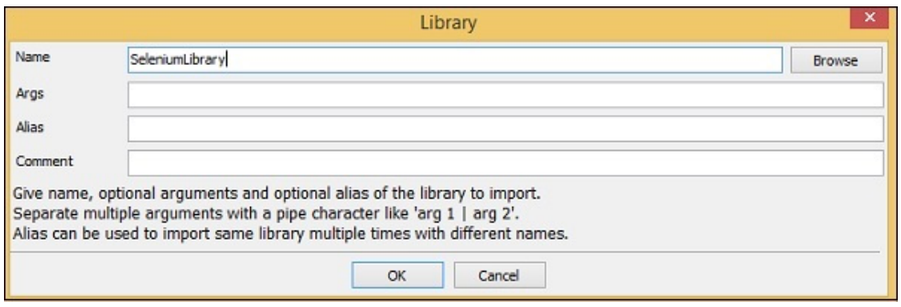


Figure 3 – Choose Selenium Library

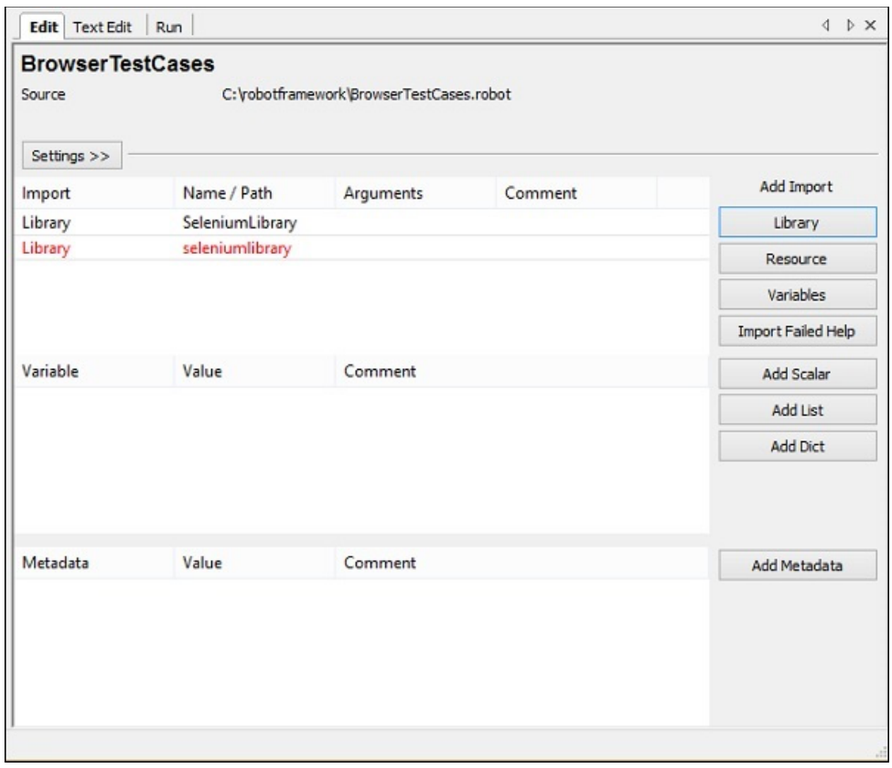


Figure 4 – Valid/invalid library import

The name given has to match with the name of the folder installed in site-packages. In case the names do not match, the library name will be in red as shown above. Library import in red is as good as the library does not exist inside python. Now, we have completed selenium library import.

3.4 PRACTICE

The official document page of Robot Framework provides users with detalied explanation and demo, students should refer to the page during the time working with this lab.

https://docs.robotframework.org/docs

https://robotframework.org/robotframework/latest/RobotFrameworkUserGuide.html#introduction

https://robotframework.org/SeleniumLibrary/SeleniumLibrary.html

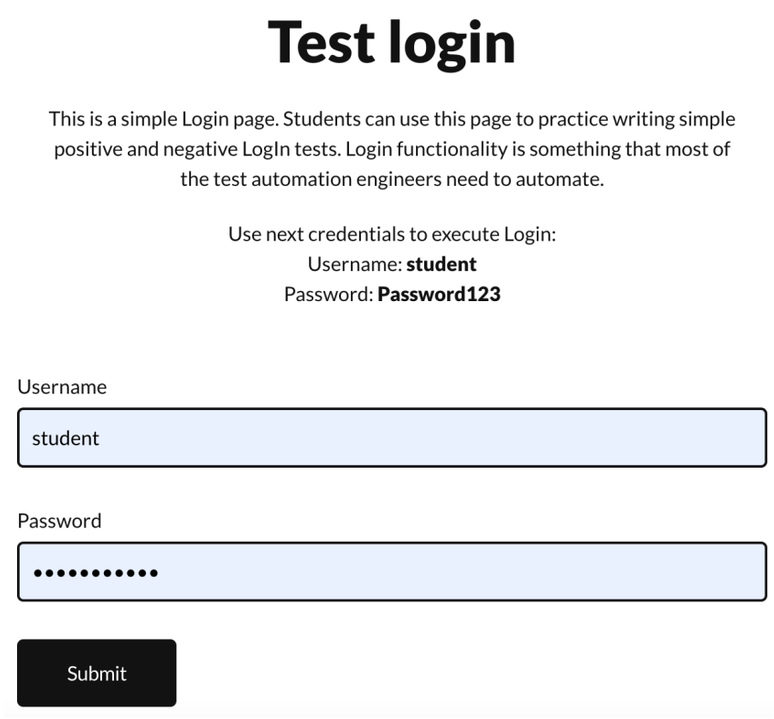
Locating elements:

https://selenium-python.readthedocs.io/locating-elements.html

Let create and run the following test scenarios and collect the results:

Assignment 1: Using selenium just installed to open and login the page below

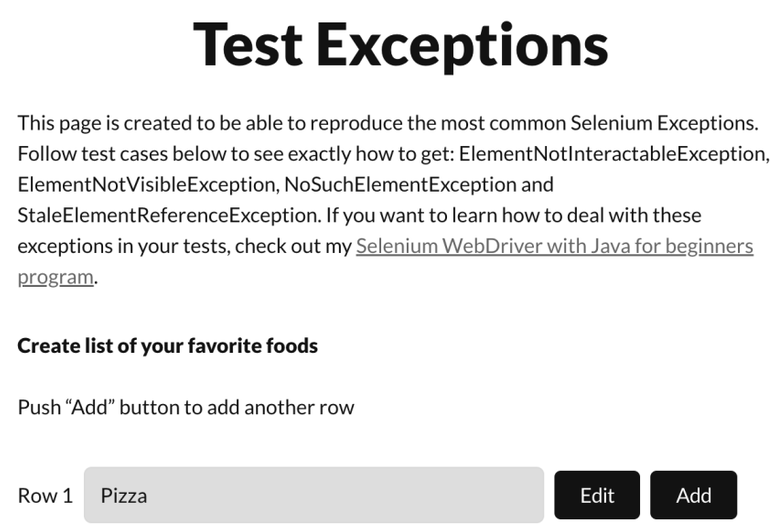
- https://practicetestautomation.com/practice-test-login/



- Verify that you logged in successfully.

Assignment 2: After logging in successfully, navigate to "PRACTICE" on menu.

- Again, navigate to "Test Exceptions", it should be like

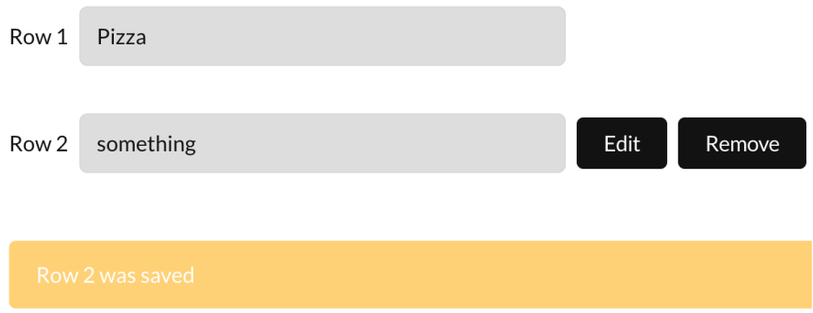


- Verify that you navigated successfully

Assignment 3:

- Add a new row by clicking "Add" button. Verify that a new row is added.

- Enter "something" to the input element of the new added row.
- Then click "Save".



- Remove the add row

- Verify that "Add" "Save" and "Remove" actions are successful

Chrome/Edge extensions for locating Xpath:

https://www.browserbear.com/blog/9-best-chrome-extensions-to-find-xpath-for-selenium-and-other-automation-tools/

4. REFERENCES

[1] Daich, G., Price, G., Ragland, B., Dawood, M. "Software Test Technologies Report." STSC, Hill Air Force Base, Utah, August 1994.

[2] https://robotframework.org/

[3] https://practicetestautomation.com/practice-test-exceptions/

[4] https://robotframework.org/SeleniumLibrary/SeleniumLibrary.html

5. REVISION HISTORY

Revision	Date	Author(s)	Description
1.0	Dec 2023	Nguyen Thanh Quan (MSc)	Created