

St. Francis Institute of Technology, Mumbai-400 103  
**Department Of Information Technology**

A.Y. 2023-2024  
Class: TE-ITA/B, Semester: V

Subject: **DevOps Lab**

**Experiment – 8: To setup and run Selenium tests in Jenkins using Maven.**

1. **Aim:** To setup and run Selenium tests in Jenkins using Maven
2. **Objectives:** Aim of this experiment is that, the students will learn:
  - Selenium and how to automate your test cases for testing web elements
  - Introduction to X-Path, TestNG and integrate Selenium with Jenkins and Maven.
3. **Outcomes:** After study of this experiment, the students will learn following:
  - Introduction to Selenium
  - Installing Selenium
  - Creating Test Cases in Selenium WebDriver
  - Run Selenium Tests in Jenkins Using Maven
4. **Prerequisite:** Knowledge of Software Engineering concept of testing and test cases.
5. **Requirements:** Jenkins, JDK, Eclipse IDE, Firefox browser, Personal Computer, Windows operating system, Internet Connection, Microsoft Word.
6. **Pre-Experiment Exercise:**  
**Brief Theory:** Refer shared material
7. **Laboratory Exercise**
  - A. **Procedure:**
    - a. **Answer the following:**
      - Explain Selenium suite?

The Selenium suite refers to a collection of tools and libraries used for automating web browser interactions. It includes:

1. Selenium WebDriver: A tool for automating web browsers, allowing you to interact with web pages, fill out forms, click buttons, and perform various actions programmatically.
2. Selenium IDE (Integrated Development Environment): A browser extension that provides a record-and-playback mechanism for creating automated test scripts.
3. Selenium Grid: A component that enables running tests on multiple browsers and platforms concurrently, distributing test execution across a network of machines.

These tools are widely used for web application testing and automation, helping to ensure the quality and reliability of web-based software.

- What are the limitations of Selenium IDE?

Selenium IDE is a popular browser extension for creating automated test scripts, but it has several limitations, including:

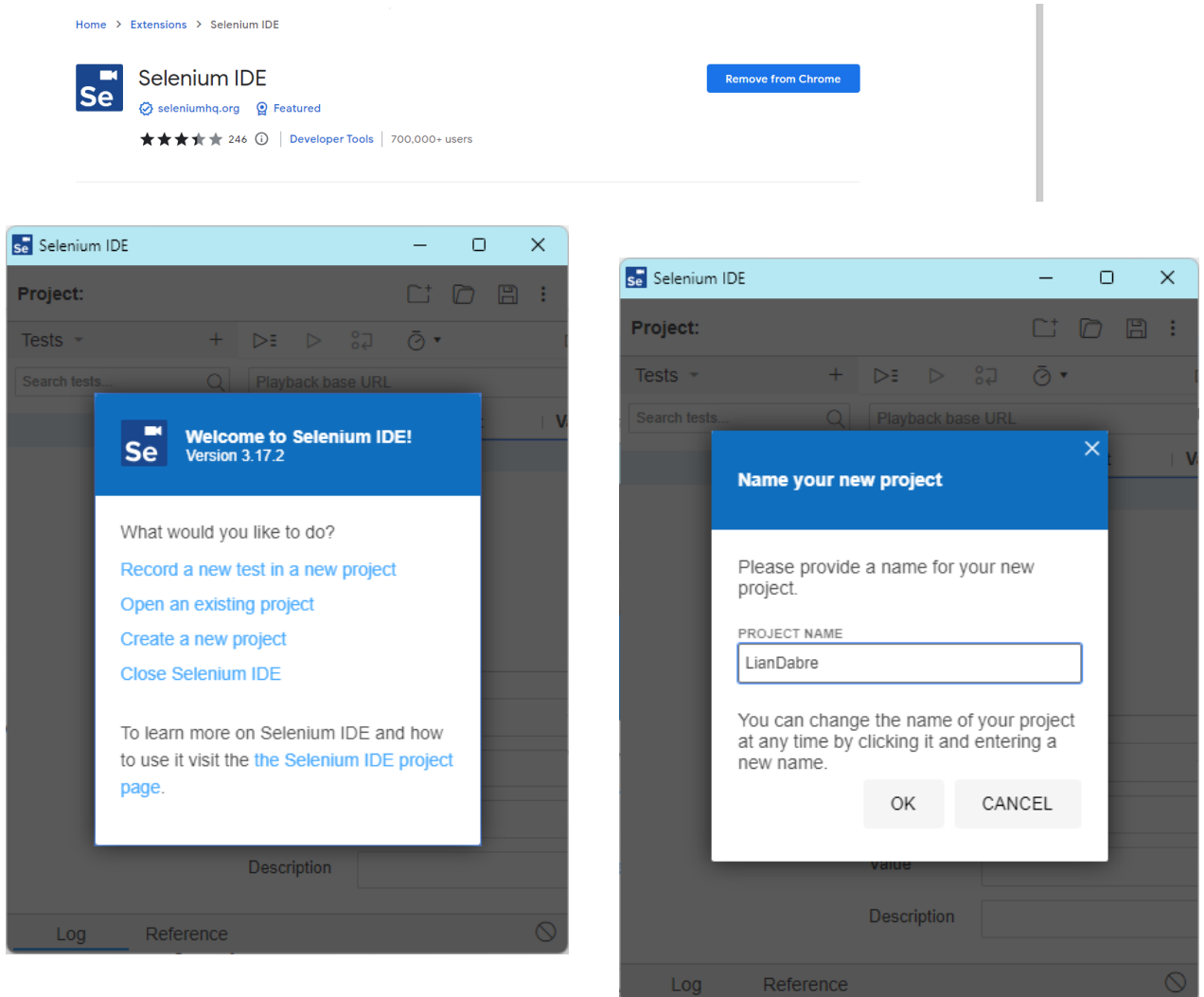
1. **\*\*Browser Dependency:\*\*** Selenium IDE is dependent on a specific browser (typically Mozilla Firefox) for recording and playback. This means that scripts created in one browser may not work in others, limiting cross-browser testing.
2. **\*\*Limited Browser Support:\*\*** It may not support all browsers, and support for different versions of browsers can be inconsistent.
3. **\*\*No Support for Complex Test Scenarios:\*\*** Selenium IDE is best suited for simple, linear test cases. It lacks the capabilities to handle complex test scenarios, conditional logic, or data-driven testing.

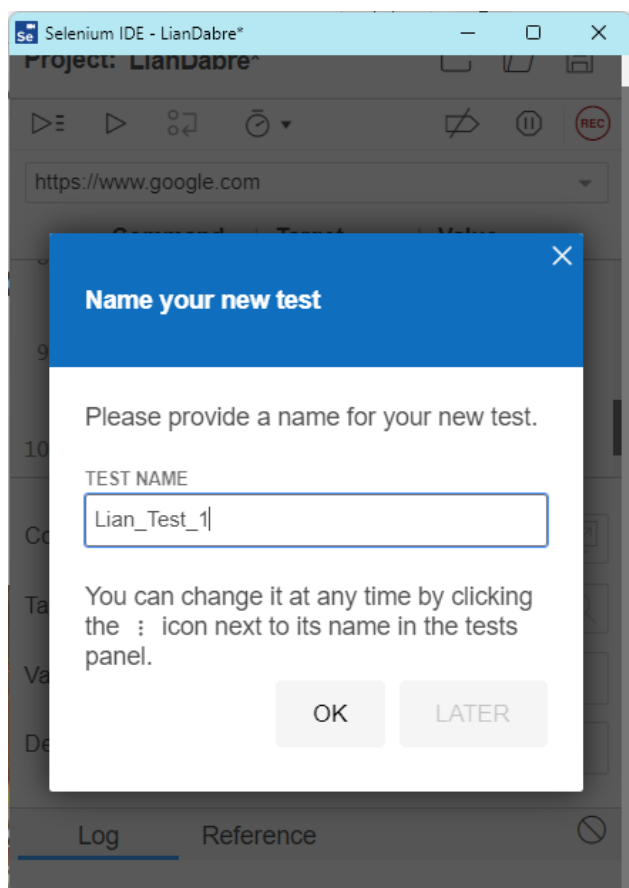
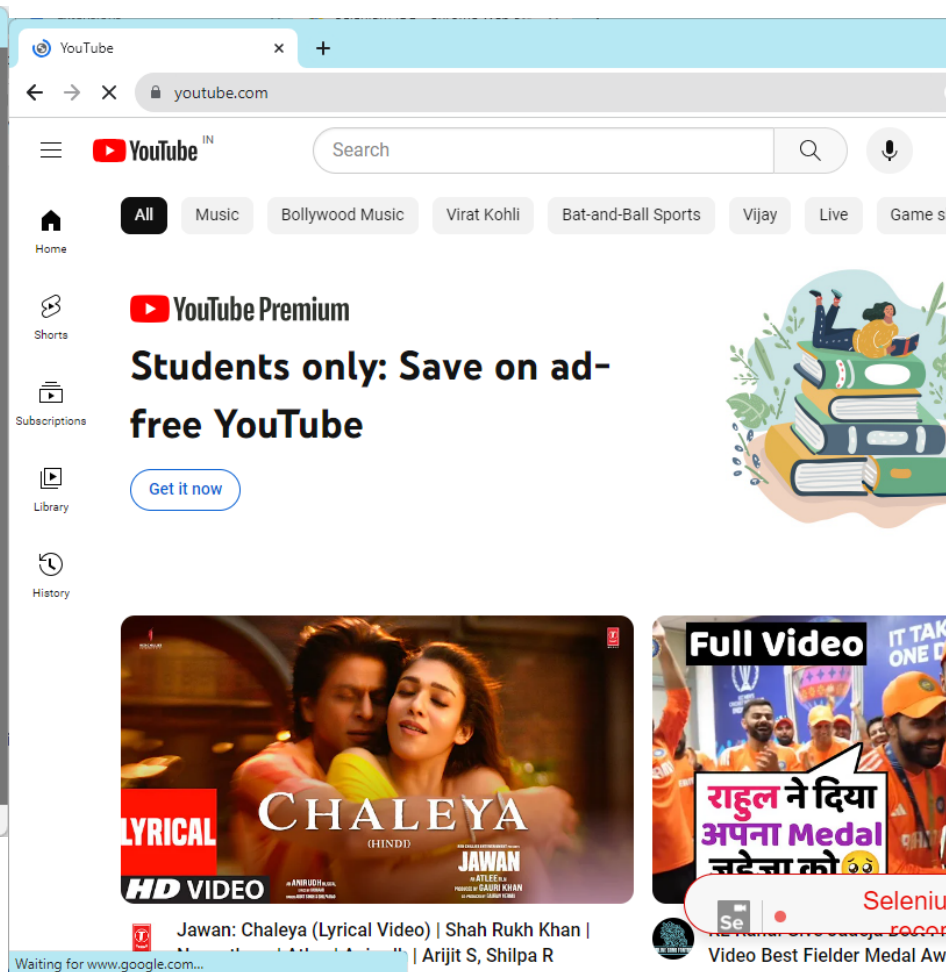
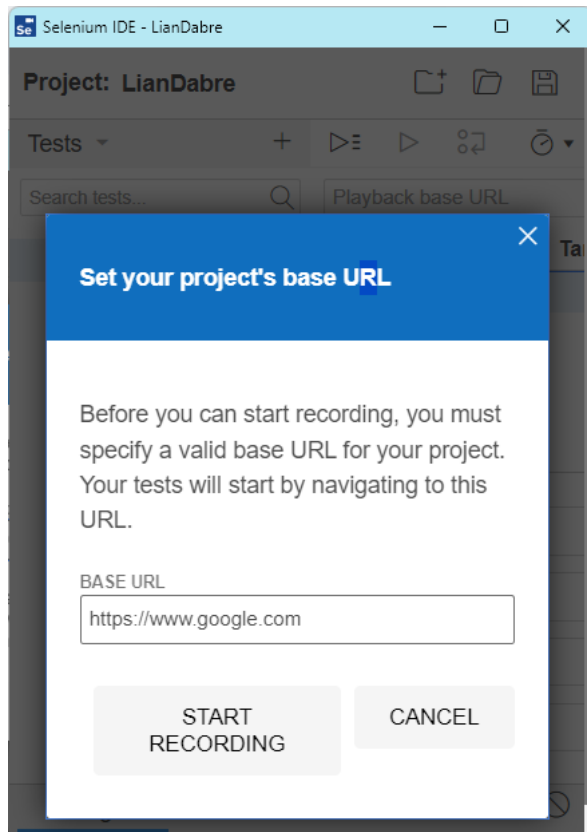
4. **Limited Programming Capabilities:** While Selenium IDE provides basic scripting capabilities, it lacks the full programming capabilities of Selenium WebDriver. You cannot create custom functions or use external libraries.
5. **Limited Support for Data-Driven Testing:** It lacks built-in support for extensive data-driven testing. You can't easily use external data sources, like spreadsheets or databases, for testing.
6. **No Support for Parallel Testing:** Selenium IDE cannot execute tests in parallel across multiple browsers or devices. This feature is available in Selenium WebDriver or Selenium Grid.
7. **No Built-in Reporting:** Selenium IDE lacks built-in reporting and test result visualization. You'll need to rely on external tools for comprehensive test reporting.
8. **Frequent UI Changes:** Web applications' user interfaces change often. Selenium IDE scripts can break when elements' locators change, making maintenance challenging.
9. **Limited Integration:** It has limited integration options with other tools and systems, which can be a problem for test management and continuous integration.
10. **Limited Cross-Platform Support:** While Selenium WebDriver supports multiple programming languages, Selenium IDE is primarily JavaScript-based, limiting cross-platform compatibility.

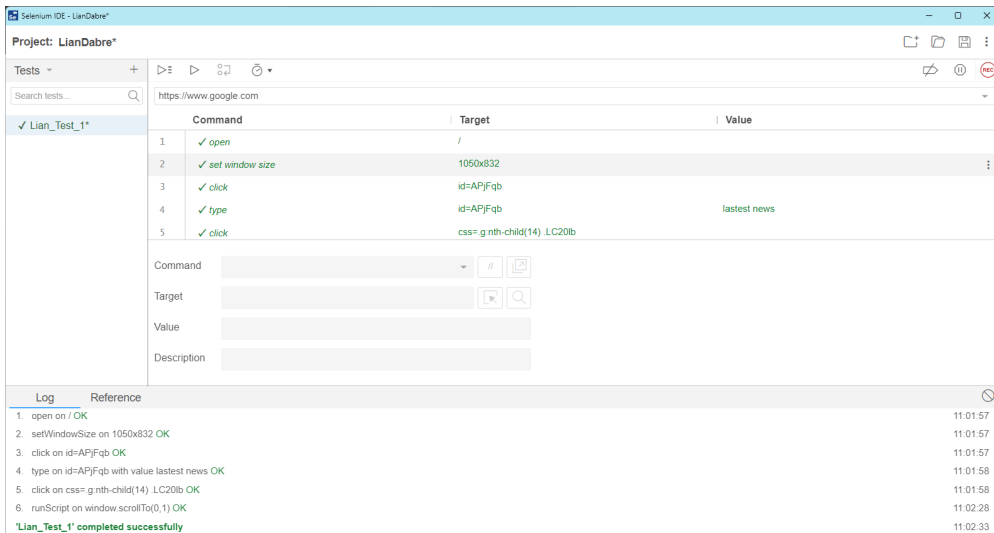
Despite its limitations, Selenium IDE is a useful tool for quick test script creation and basic test automation. However, for more complex and robust test automation, Selenium WebDriver is often preferred.

**b. Execute following (Refer the shared material) and attach screenshots:**

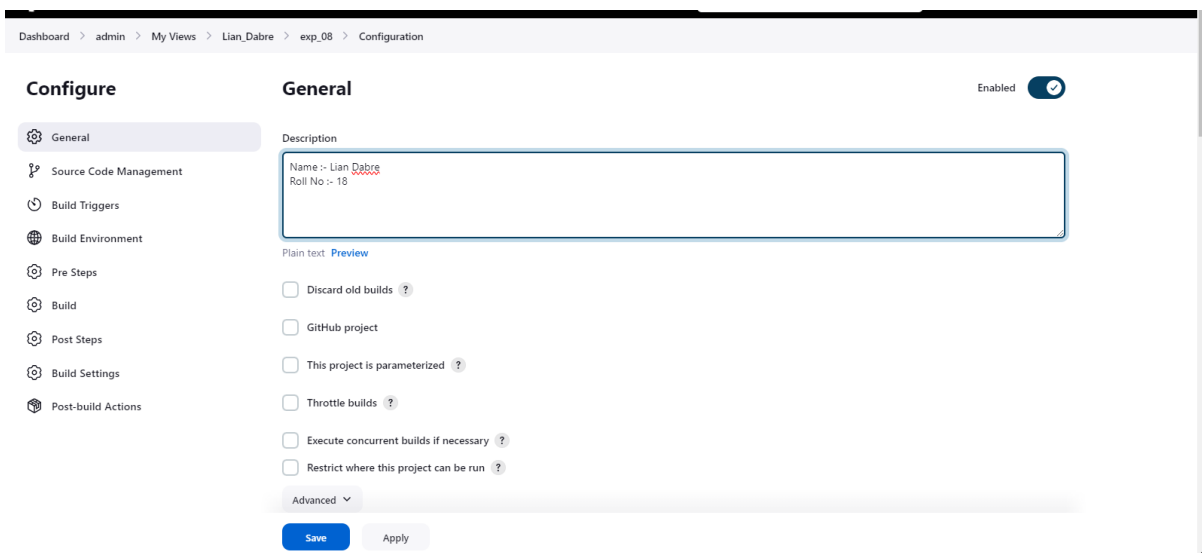
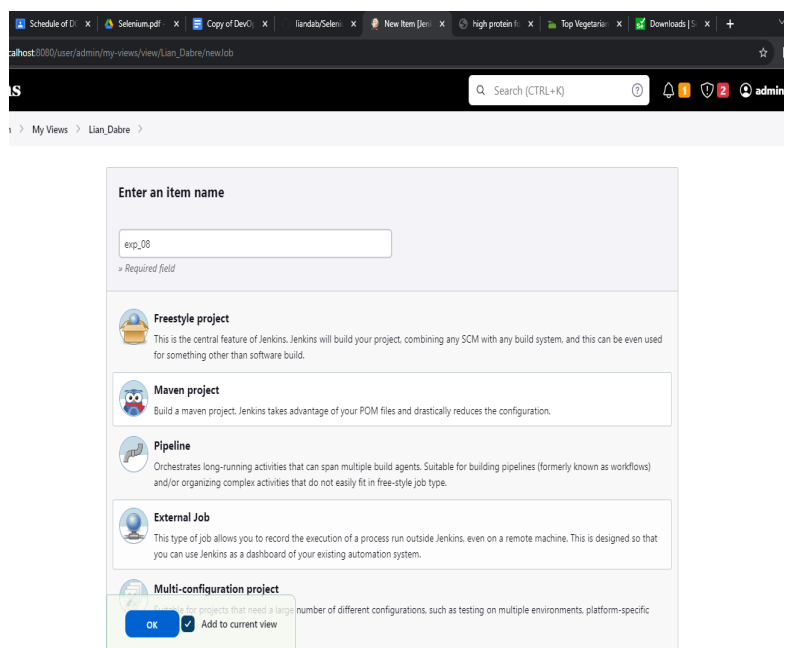
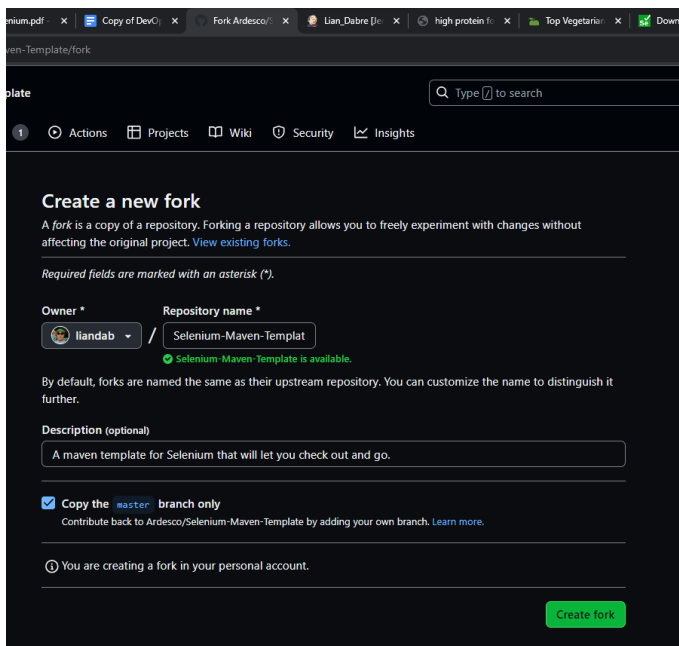
- Create and run a test case on Chrome/Firefox browser with selenium IDE addon







- Create a Maven Project in Jenkins and run selenium tests using selenium Grid



Dashboard

admin

My Views

Lian\_Dabre

exp\_08

#1

Console Output

```
ome\64bit\chromedriver.exe
[INFO]
[INFO] -----
[INFO] SELENIUM STAND-ALONE EXECUTABLE DOWNLOADS COMPLETE
[INFO] -----
[INFO]
[INFO]
[INFO] --- surefire:3.1.2:test (default-test) @ selenium-maven-template ---
[JENKINS] Recording test results
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 18.070 s
[INFO] Finished at: 2023-10-20T11:13:23+05:30
[INFO] -----
Waiting for Jenkins to finish collecting data
[JENKINS] Archiving C:\ProgramData\Jenkins\jenkins\workspace\exp_08\pom.xml to com.lazercode.selenium/selenium-maven-template/1.0-SNAPSHOT/selenium-maven-template-1.0-SNAPSHOT.pom
channel stopped
Finished: SUCCESS
```

REST APIJenkins 2.414.1

Dashboard

Manage Jenkins

Plugins

Installed plugins

Advanced settings

Download progress

Q selenium

Name

Enabled

Selenium Auto Exec Server(AES) plugin 0.5

This plugin is for continuous regression test by Selenium Auto Exec Server (AES).  
[Report an issue with this plugin](#)

Selenium Builder plugin 1.14

Jenkins plugin which invokes scripts using the Selenium Builder interpreter  
[Report an issue with this plugin](#)

Selenium Capability Axis 0.0.6

Axis for current capabilities of a Selenium Server  
[Report an issue with this plugin](#)

Selenium HTML report 1.1

This is an Jenkins plugin to visualize the results of selenium tests  
[Report an issue with this plugin](#)

Selenium Plugin 3.141.59

Warning: The currently installed plugin version may not be safe to use. Please review the following security notices:

• Complete lack of CSRF protection can lead to OS command injection

This plugin is up for adoption! We are looking for new maintainers. Visit our [Adopt a Plugin](#) initiative for more information.

Dashboard

admin

My Views

Lian\_Dabre

exp\_08

#2

Selenium Html Report

Status

Changes

Console Output

Edit Build Information

Delete build '#2'

Git Build Data

Redeploy Artifacts

Selenium Html Report

See Fingerprints

Previous Build

The Selenium test reports.

| Result | Name | Tests total | Tests passes | Tests failures | Commands passes | Commands failures | Commands errors | Duration              |
|--------|------|-------------|--------------|----------------|-----------------|-------------------|-----------------|-----------------------|
| Summen |      | 0           | 0            | 0              | 0               | 0                 | 0               | 0 s = 0.0 min and 0 s |

Jenkins

Search (CTRL+K)

?

1

2

admin

log out

Dashboard > Selenium Grid

Back to Dashboard

Status

Configurations

Console Output

Restart

### Hub management

#### Configuration

Host: localhost

Port: 4444

#### Status

Online

Running at localhost:4444.

See [Console Output](#) and [Grid Web Console](#) for detailed status and configuration

Selenium 1 clients should connect as follow:

```
Selenium selenium = new DefaultSelenium("localhost", 4444, "*firefox", "http://my.test.site.org/");
```

Selenium 2 clients should connect as follow:

Inbox (1,325) - MailSchedule of DOL...Selenium.pdf - Google...Copy of DevOps...exp\_08 Config...Selenium-Maven...high protein food...Top Vegetarian Pr...

localhost:8080/user/admin/my-views/view/Lian\_Dabre/job/exp\_08/configure

Incognito

Dashboard > admin > My Views > Lian\_Dabre > exp\_08 > Configuration

Configure

General

Source Code Management

Build Triggers

Build Environment

Pre Steps

Build

Post Steps

Build Settings

Post-build Actions

Add post-build step

#### Build Settings

☐ E-mail Notification

#### Post-build Actions

Publish Selenium Html Report

Selenium tests results location relative to workspace

target

☒ Set build result state to failure if an exception occurred while parsing result files

Add post-build action

Save

Apply

Saved

REST APIJenkins 2.414.1

Inbox (1,325) - MailSchedule of DOL...Selenium.pdf - Google...Copy of DevOps...Selenium global...Selenium-Maven...high protein food...Top Vegetarian Pr...

localhost:8080/selenium/add

Incognito

Dashboard > Selenium Grid

Type

☐ Custom RC node configuration

☒ Custom web driver node configuration

Preferred port

4445

Max node sessions

5

XT11 display

Internet Explorer

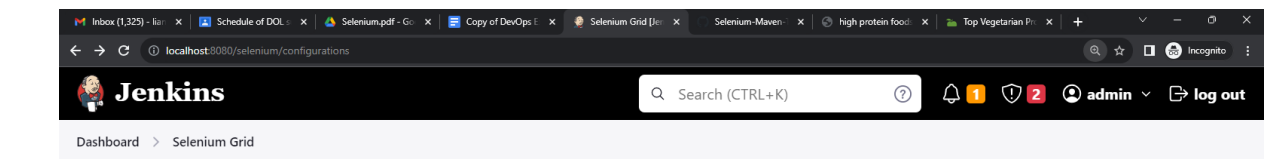
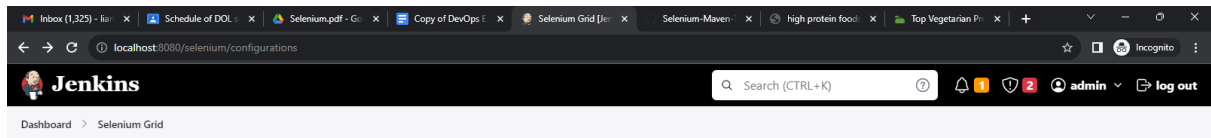
Maximum instances

1

Version

IE driver path

Advanced



| Type | Delete | Name             | Matching type   | Description summary   |
|------|--------|------------------|-----------------|---|
|      |        | exp8             | Match all nodes | 1 instances of Internet Explorer (version : Not specified)<br>5 instances of Firefox (version : Not specified)<br>5 instances of Chrome (version : Not specified) |
|      |        | vighnesh_exp8    | Match all nodes | 1 instances of Internet Explorer (version : Not specified)<br>5 instances of Firefox (version : Not specified)<br>5 instances of Chrome (version : Not specified) |
|      |        | LianDabre_Config | Match all nodes | 1 instances of Internet Explorer (version : Not specified)<br>5 instances of Firefox (version : Not specified)<br>5 instances of Chrome (version : Not specified) |

## 8. Post-Experiments Exercise

### A. Extended Theory:

Nil

### B. Questions:

- What are Locators? Explain its types.
- What is the benefit of using Selenium Grid with Jenkins?

### C. Conclusion:

- Write what was performed in the experiment.
- Write the significance of the topic studied in the experiment.

### D. References:

<https://jenkins.io/doc/>  
<https://www.slideshare.net/abediaz/introduction-to-jenkins>  
<https://q-automations.com/2019/09/26/selenium-grid-with-jenkins/>