Gokhale Education Society's

R. H. Sapat College of Engineering, Management Studies & Research, Nasik -422005

DEPARTMENT OF COMPUTER ENGINEERING

LAB MANUAL

FOR

B.E. COMPUTER (SEM – VII)

Academic Year 2023-2024

LABORATORY PRACTICE-IV

SUBJECT CODE: 410247

(SOFTWARE TESTING & QUALITY ASSURANCE)

Teaching Scheme:	**Credit: 01**	**Examination Scheme:**
PR: 02 Hrs /Week		**TW: 50 Marks**

INDEX

Practical No.	Practical to be covered
1	Write TEST Scenario for Gmail Login Page.
2	Write Test Scenario for Gmail Inbox.
3	Write Test cases in excel sheet for Social Media application or website.
4	Create Defect Report for Any application or web application.
5	Installation of Selenium grid and selenium Web driver java eclipse (automation tools).
6	Mini Project

Prepared By	Approved By
Prof. S.A. Shinde	**Dr. D. V. Patil** **HOD**

PREFACE

SOFTWARE REQUIRED: Selenium Tool.

OPERATING SYSTEM: Latest 64-BIT Version Open source Linux or its derivative and update of Microsoft Windows 7/ 8 Operating System onwards or 64-bit

Assignment No- 01

Title: - Write TEST Scenario for Gmail Login Page.

OBJECTIVE: -

- To learn and understand Test Scenario and Test Cases.

SOFTWARE USED / PROGRAMMING LANGUAGES USED:

- **Ubuntu / Windows**

THEORY: -

What is a Test Scenario?

A Test Scenario is defined as any functionality that can be tested. It is also called Test Condition or Test Possibility. As a tester, we should put ourselves in the end user's shoes and figure out the real-world scenarios and use cases of the Application-Under-Test.

Why create Test Scenarios?

Test Scenarios are created for the following reasons,

- Creating Test Scenarios ensures complete Test Coverage
- Test Scenarios can be approved by various stakeholders like Business Analyst, Developers, and Customers to ensure the Application-Under-Test is thoroughly tested. It ensures that the software is working for the most common use cases.
- They serve as a quick tool to determine the testing work effort and accordingly create a proposal for the client or organize the workforce.
- They help determine the most important end-to-end transactions or the real use of the software applications.
- For studying the end-to-end functioning of the program, Test Scenario is critical.

How to Write Test Scenarios?

Five steps to create Test Scenarios-

1. Read the Requirement Documents like BRS, SRS, FRS, of the System-Under-Test (SUT). You could also refer uses cases, books, manuals, etc. of the application to be tested.
2. For each requirement, figure out possible users actions and objectives. Determine the technical aspects of the requirement. Ascertain possible scenarios of system abuse and evaluate users with hacker's mindset.

3. After reading the Requirements Document and doing your due Analysis, list out different test scenarios that verify each feature of the software.
4. Once we have listed all possible Test Scenarios, a Traceability Matrix is created to verify that each & every requirement has a corresponding Test Scenario
5. The scenarios created are reviewed by our supervisor. Later, they are also reviewed by other Stakeholders in the project.

Test Scenario – Gmail Login Page

Sr. No.	**Test Scenario – Gmail Login Page**
1	Enter the valid email address & click next. Verify if the user gets an option to enter the password.
2	Don’t enter an email address or phone number & just click the Next button. Verify if the user will get the correct message or if the blank field will get highlighted.
3	Enter the invalid email address & click the Next button. Verify if the user will get the correct message.
4	Enter an invalid phone number & click the Next button. Verify if the user will get the correct message.
5	Verify if a user can log in with a valid email address and password.
6	Verify if a user can log in with a valid phone number and password.
7	Verify if a user cannot log in with a valid phone number and an invalid password.
8	Verify if a user cannot log in with a valid email address and a wrong password.
9	Verify the ‘Forgot email’ functionality.
10	Verify the ‘Forgot password’ functionality.

Output

Sr. No.	Test Scenario – Gmail Login Page	Pass /Fail/ Not Executed/Suspended
1	Enter the valid email address & click next. Verify if the user gets an option to enter the password.	
2	Don’t enter an email address or phone number & just click the Next button. Verify if the user will get the correct message or if the blank field will get highlighted.	
3	Enter the invalid email address & click the Next button. Verify if the user will get the correct message.	
4	Enter an invalid phone number & click the Next button. Verify if the user will get the correct message.	
5	Verify if a user can log in with a valid email address and password.	
6	Verify if a user can log in with a valid phone number and password.	
7	Verify if a user cannot log in with a valid phone number and an invalid password.	
8	Verify if a user cannot log in with a valid email address and a wrong password.	
9	Verify the ‘Forgot email’ functionality.	
10	Verify the ‘Forgot password’ functionality.	

Questions:

1) Difference between Test case and Test Scenarios

2) How To Classify Positive And Negative Test Scenarios?

Assignment No- 02

Title :- Write Test Scenario for Gmail Inbox.

OBJECTIVE: -

- To learn and understand Test Scenario and Test Cases.

SOFTWARE USED / PROGRAMMING LANGUAGES USED:

- **Ubuntu / Windows**

THEORY: -

In the test scenario, there is a detailed testing process due to many associated test cases. Before performing the test scenario, the tester has to consider the test cases for each scenario.

In the test scenario, testers need to put themselves in the place of the user because they test the software application under the user's point of view. Preparation of scenarios is the most critical part, and it is necessary to seek advice or help from customers, stakeholders or developers to prepare the scenario.

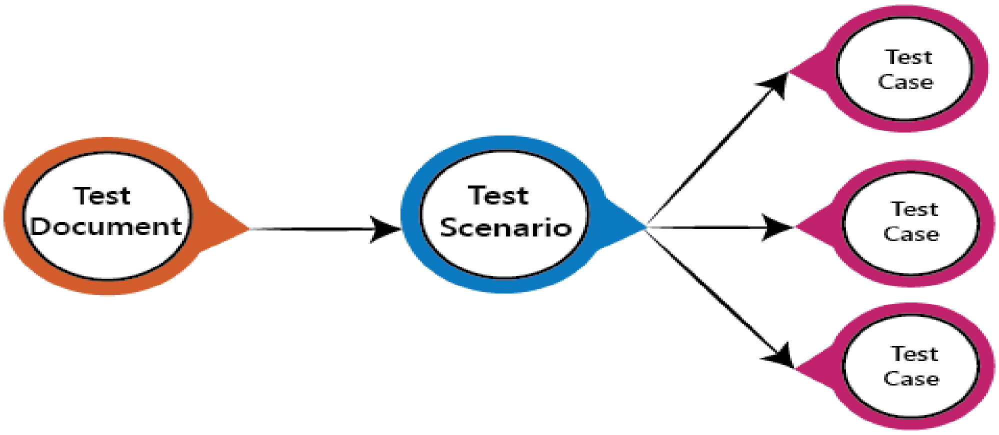

Fig 2.1: Test Scenario

Test Scenario – Gmail Inbox

Sr. No.	Test Scenario – Gmail Inbox
1	Click on the inbox, and verify all received mail are displayed and highlighted in the inbox.
2	Check that a latest received mail has been displayed to the sender email id correctly.
3	Select the mail, reply and forward send it; check in the sent item of sender and inbox of the receiver.
4	Check for any attached attachments to the mail that are downloaded or not.
5	Check that attachment is scanned correctly for any viruses before download.
6	Select the mail, reply and forward save as draft, and check for the confirmation message and checks in the Draft section.
7	Check all the emails are marked as read are not highlighted.
8	Check all mail recipients in Cc are visible to all users.
9	Checks all email recipients in Bcc are not visible to the users.
10	Select mail, delete it, and then check in the Trash section.

Test Scenario – Gmail Inbox (Output)

Sr. No.	Test Scenario – Gmail Inbox	Pass /Fail/ Not Executed/Suspended
1	Click on the inbox, and verify all received mail are displayed and highlighted in the inbox.	
2	Check that a latest received mail has been displayed to the sender email id correctly.	
3	Select the mail, reply and forward send it; check in the sent item of sender and inbox of the receiver.	
4	Check for any attached attachments to the mail that are downloaded or not.	
5	Check that attachment is scanned correctly for any viruses before download.	
6	Select the mail, reply and forward save as draft, and check for the confirmation message and checks in the Draft section.	
7	Check all the emails are marked as read are not highlighted.	
8	Check all mail recipients in Cc are visible to all users.	
9	Checks all email recipients in Bcc are not visible to the users.	
10	Select mail, delete it, and then check in the Trash section.	

Questions:

1) Explore Features of Test Scenario.

2) When not to create Test Scenario?

Assignment No- 03

Title: Write Test cases in excel sheet for Social Media application or website.

OBJECTIVE: -

- To understand Test Cases need to be simple and transparent.
- To Create Test Case with End User in Mind.

SOFTWARE USED / PROGRAMMING LANGUAGES USED:

- **Ubuntu /Windows**

THEORY: -

What is a Test Case?

A Test Case is a set of actions executed to verify a particular feature or functionality of our software application. A Test Case contains test steps, test data, precondition, and post condition developed for specific test scenario to verify any requirement. The test case includes specific variables or conditions, using which a testing engineer can compare expected and actual results to determine whether a software product is functioning as per the requirements of the customer.

How to write good Test Case?

1. *Test Cases need to be simple and transparent*:

   Create test cases that are as simple as possible. They must be clear and concise as the author of the test case may not execute them.

2. *Create Test Case with End User in Mind:*

   The ultimate goal of any software project is to create test cases that meet customer requirements and is easy to use and operate. A tester must create test cases keeping in mind the end user perspective

3. *Avoid test case repetition:*

   Do not repeat test cases. If a test case is needed for executing some other test case, call the test case by its test case id in the pre-condition column

4. *Do not Assume:*

   Do not assume functionality and features of your software application while preparing test case. Stick to the Specification Documents.

5. *Ensure 100% Coverage:*

   Make sure our write test cases to check all software requirements mentioned in the specification document. Use Traceability Matrix to ensure no functions/conditions is left untested.

6. *Test Cases must be identifiable:*

   Name the test case ID such that they are identified easily while tracking defects or identifying a software requirement at a later stage.

How to write test cases?

Whenever we will be asked to write the test cases for the ‘Form with some controls’, we need tofollow the list of rules for writing test cases as mentioned below:

- Write a test case on each form object.
- Written test cases should be a combination of both negative and positive test cases.
- Test cases should always be a combination of functional, performance, usability, and compatibility test cases.

Questions:

1) How to Write Test Cases in Manual Testing?
2) Is i t possible to achieve 100% testing coverage? How would ensure it?

Assignment No- 04

Title: - Create Defect Report for Any application or web application

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OBJECTIVE: -

- To identifies and describes a defect detected.
- To find out the defects easily and fix them up.

SOFTWARE USED / PROGRAMMING LANGUAGES USED:

- **Ubuntu /Windows**

THEORY: -

Defect:

A defect in a software product is also known as a bug, error or fault which makes the software produce an unexpected result as per the software requirements. For example; incorrect data, system hangs, unexpected errors, missing or incorrect requirements.

Defect Report:

A defect report is a document that has concise details about what defects are identified, what action steps make the defects show up, and what are the expected results instead of the application showing error (defect) while taking particular step by step actions.

Defect reports are usually created by the Quality Assurance team and also by the end-users (customers). Often customers detect more defects and report them to the support team of the software development since the majority of the customers curiously tries out every feature in the application. Now, you know what actually defect and defect reports are.

Why defect reports are created?

- To help developers to find out the defects easily and fix them up.
- A defect report is usually assigned by QA to a developer who then reads the report and reproduces the defects on the software product by following the action steps mentioned in the report. After that, the developer fixes the defects in order to get the desired outcome specifiedin the report.
- Defect reports should be short, organized, and straight to the point and covers all the information that the developer needs to detect the actual defects in the report by doing what and how the one written the defect report detected the defects.

A typical defect report contains:-

1. ***Defect ID***: Nothing but a serial number of defects in the report.
2. ***Defect Description***: A short and clear description of the defect detected.
3. ***Action Steps***: What the client or QA did in an application that results in the defect.
4. ***Expected Result***: What results are expected as per the requirements when performing the action steps mentioned.
5. ***Actual Result***: What results are actually showing up when performing the action steps.
6. ***Severity***: Trivial (A small bug that doesn’t affect the software product usage).
   a. Low: A small bug that needs to be fixed and again it’s not going to affect the performanceof the software.
   b. Medium: This bug does affect the performance. Such as being an obstacle to do a certainaction. Yet there is another way to do the same thing.
   c. High: It highly impacts the software though there is a way around to successfully do whatthe bug cease to do.
   d. Critical: These bugs heavily impacts the performance of the application. Like crashing thesystem, freezes the system or requires the system to restart for working properly.
7. ***Attachments***: A sequence of screenshots of performing the step by step actions and getting the unexpected result. One can also attach a short screen recording of performing the steps and encountering defects. Short videos help developers and/or QA to understand the bugs easily and quickly.
8. ***Additional Information***: The platform you used, operating system and version. And other information which describes the defects in detail for assisting the developer understand the problem and fixing the code for getting desired results.

Questions:

1) Explore Defect Management Process?

2) Explain with neat diagram Bug Life Cycle in Software Development?

Assignment No- 05

Title: - Installation of Selenium grid and selenium Web driver java eclipse (automation tools).

OBJECTIVE: -

- To understand Eclipse editor
- To understand the Selenium Grid and WebDriver

SOFTWARE USED / PROGRAMMING LANGUAGES USED:

- Ubuntu / Windows
- Jdk 1.8.1
- Eclipse
- Selenium Grid file
- Selenium WebDriver jar file

10.4 THEORY: -

Selenium Selenium is a free (open source) automated testing suite for web applications across different browsers and platforms. Selenium is a suite of software tools to automate Web Browsers. It is an Open source suite of tools mainly used for Functional and Regression Test Automation. Selenium is a free (open source) automated testing suite for web applications across different browsers and platforms. It is quite similar to HP Quick Test Pro (QTP now UFT) only that Selenium focuses on automating web-based applications. Testing done using Selenium tool is usually referred as Selenium Testing.

Selenium supports various Operating environments.

- MS Windows
- Linux
- Macintosh etc…
- Selenium supports various Browsers.
- Mozilla Firefox
- IE
- Google Chrome
- Safari
- Opera etc…

Selenium supports various programming environments to write programs (Test scripts)

- **Java**
- **C#**
- **Python**
- **Perl**
- **Ruby**
- **PHP**

History of the Selenium Project

- **In the year 2004, there was this guy named Jason Huggins from ThoughtWorks, Chicago. He built Core mode of Selenium as “JavaScriptTestRunner” to verify the behavior of the web application he was testing, Time and Expenses application.**
- **He built it in a way that people could write tests using a keyword-driven approach in HTML files.**

- **A guy named Paul Hammant from ThoughtWorks again, who circumvented this limitation by coming up with Selenium RC (Remote Control). This has a Selenium Client and a Selenium Server. The client would send commands to the server and this server would use JavaScript to drive the browser.**
- **In around 2007, one more guy named Simon Stewart at ThoughtWorks was working on another web testing tool named WebDriver.**
- **Selenium 1 (Selenium IDE + Selenium RC + Selenium Grid)**
- **Selenium 2 (Selenium IDE + Selenium RC + Selenium WebDriver + Selenium Grid)**

Selenium's Tools Suite
Selenium is not just a single tool but a suite of software's, each catering to different testing needs of an organization. It has four components.
1. Selenium Integrated Development Environment (IDE)
2. Selenium Remote Control (RC)
3. WebDriver
4. Selenium Grid

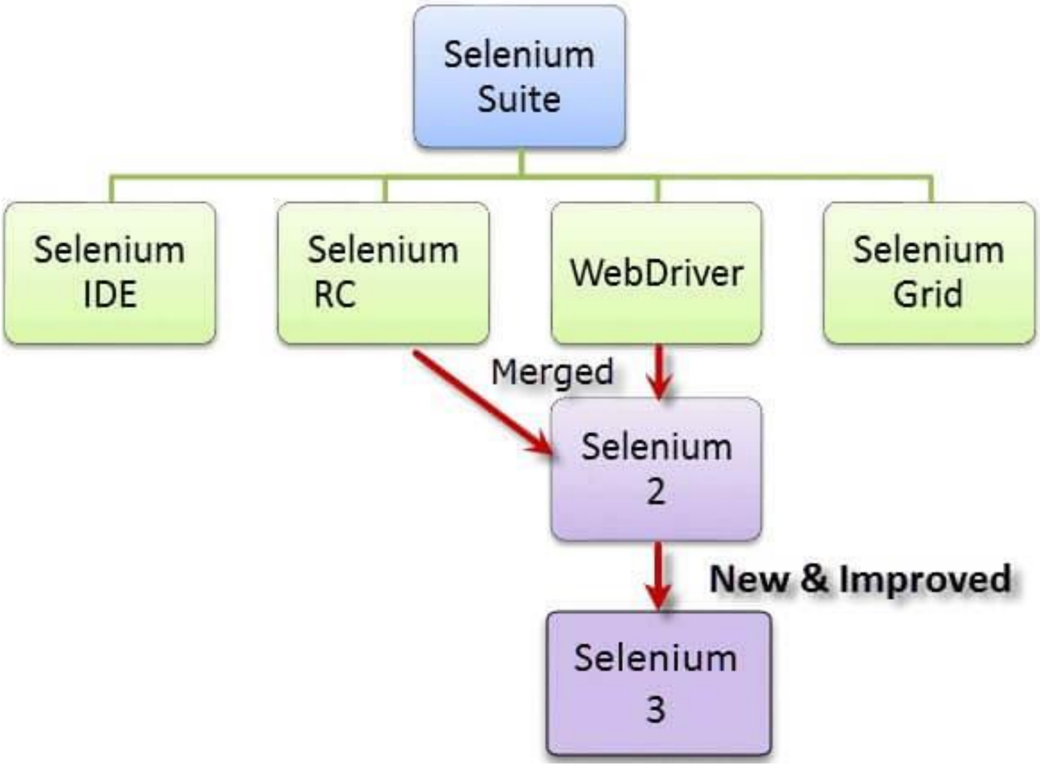


Fig: 5.1 : Selenium Suit

At the moment, Selenium RC and WebDriver are merged into a single framework to form Selenium 2. Selenium 1, by the way, refers to Selenium RC.

- **Selenium Grid**

Selenium Grid is a part of the Selenium Suite that specializes in running multiple tests across different browsers, operating systems, and machines in parallel. It is achieved by routing the commands of remote browser instances where a server acts as a hub. A user needs to configure the remote server in order to execute the tests.
Selenium Grid has 2 versions – the older Grid 1 and the newer Grid 2.

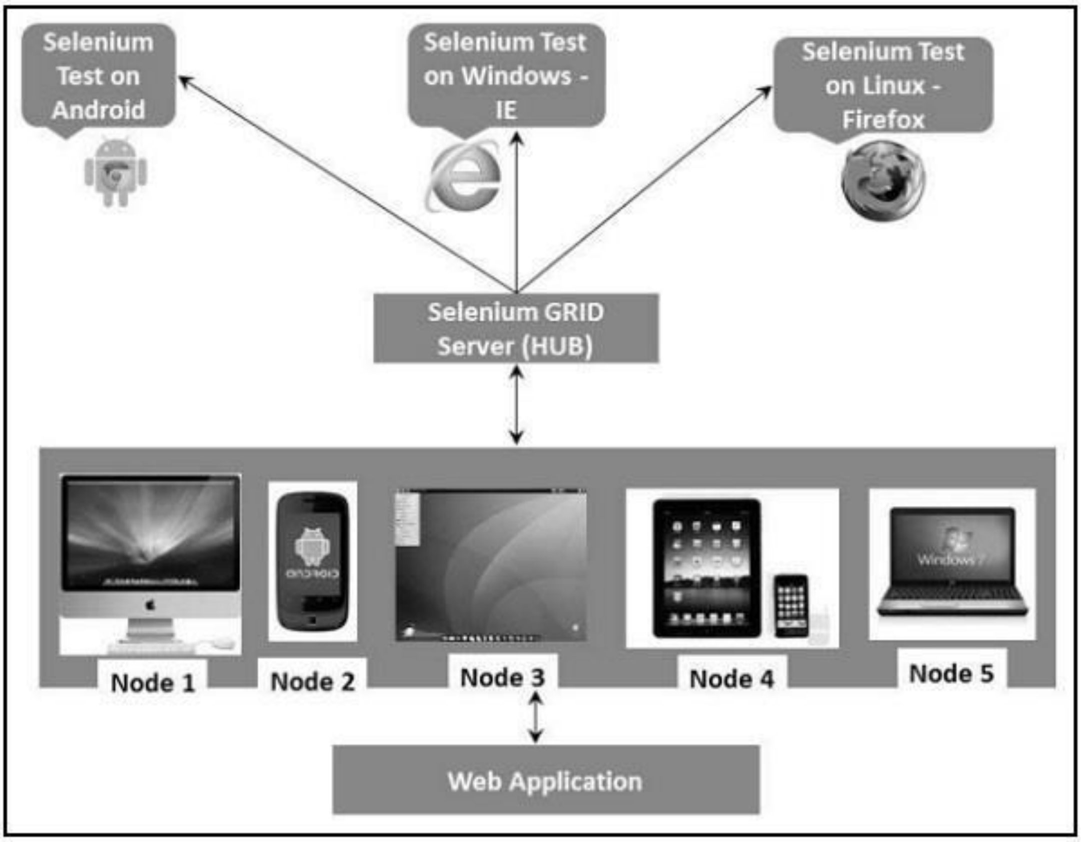

Selenium Test on Android
Selenium Test on Windows - IE
Selenium Test on Linux - Firefox
Selenium GRID Server (HUB)
Node 1
Node 2
Node 3
Node 4
Node 5
Web Application

Fig. 5.2: Selenium Grid

Selenium WebDriver

WebDriver is a tool for automating testing web applications. It is popularly known as Selenium 2.0. WebDriver uses a different underlying framework, while Selenium RC uses JavaScript Selenium-Core embedded within the browser which has got some limitations. WebDriver interacts directly with the browser without any intermediary, unlike Selenium RC that depends on a server.

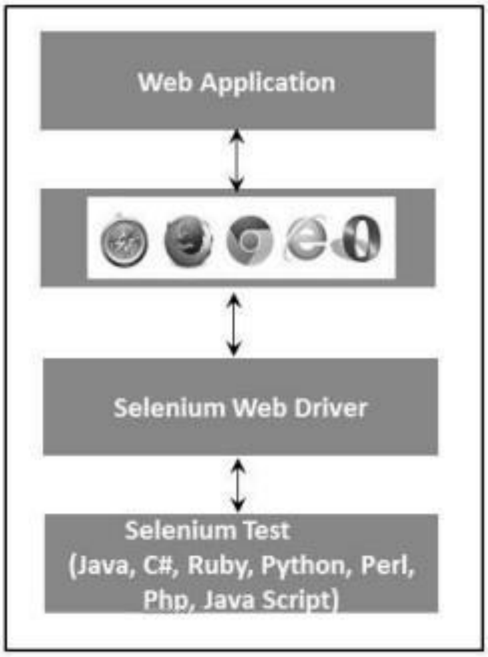


Fig. 5.3 : Seleium WebDriver

Installation and execution of Selenium Components

Step by step execution of Selenium WebDriver

1. Download and Install Java

2. Download and Configure Eclipse

3. Configure FireBug and FirePath add-on on browser

4. Configure Selenium WebDriver
a. Download latest selenium-server-standalone-3.14.0 jar File from following link https://www.seleniumhq.org/download/ (here on site 3.14.0 version is latest)

b. The downloaded file is in Zipped format and one has to unzip the contents.
5. Download and Extract Mozilla GeckoDriver

6. Launch "Eclipse" from the Extracted Eclipse folder.

7. Now create a 'New Project' from 'File' menu.

8. Enter the Project Name and Click 'Next'.

9. Go to Libraries Tab and select all the JAR's that we have downloaded. Add reference to all the JAR's of Selenium WebDriver Library folder and also selenium-java-3.14.0.jar and selenium-java-3.14.0-srcs.jar.

10. Now right-click on the package and select 'New' >> 'Class' to create a 'class'.

11. Now name the class and make it the main function.

12. Now to write code.

13. Right click on java program, select Run As and > "Java Application". After Code Successfully Run now see the output in Console Prompt

14. Now Your browser Open Automatically.

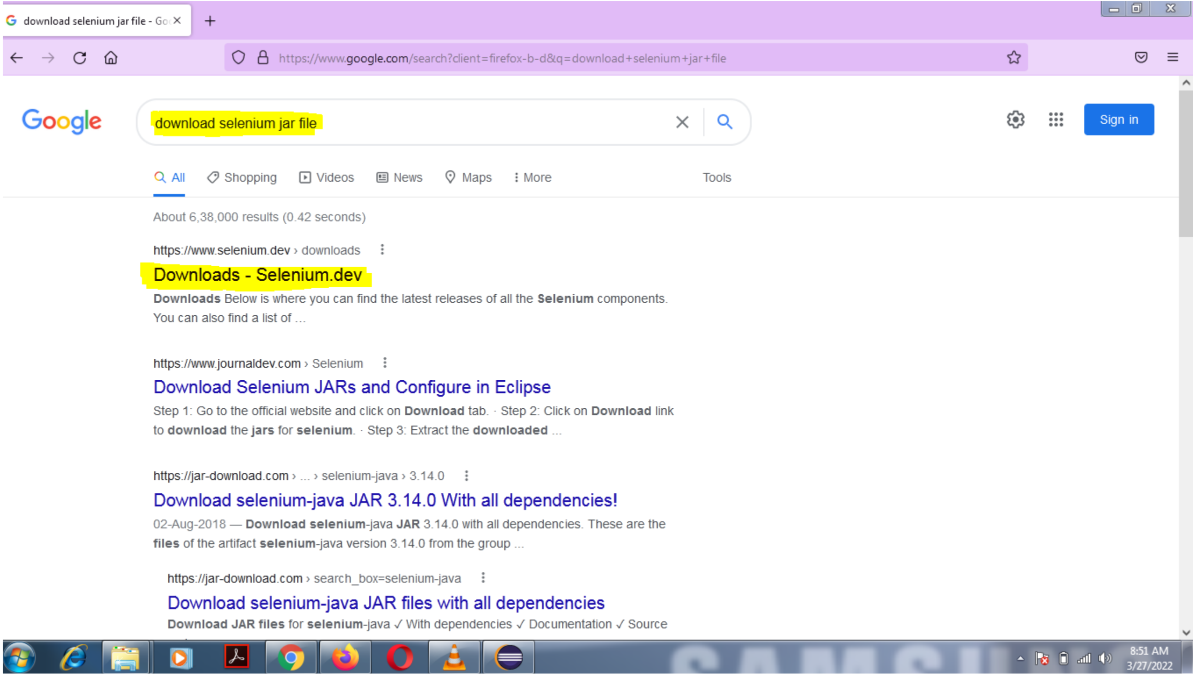
Step by step execution of Selenium Grid

(Student have to write steps to execute their application using Selenium Grid.)

Step-I: Create a new java project
Note: Click on Don’t Create Module
Step-II: Download Selenium jar file
a) Search Download Selenium jar file and select download-selenium.dev

OR

b) Use this URL----> https://www.selenium.dev/downloads/


download selenium jar file - Go
https://www.google.com/search?client=firefox-b-d&q=download+selenium+jar+file

All Shopping Videos News Maps More Tools

download selenium jar file

About 6,38,000 results (0.42 seconds)

https://www.selenium.dev › downloads

Downloads - Selenium.dev

Downloads Below is where you can find the latest releases of all the **Selenium** components. You can also find a list of ...

https://www.journaldev.com › Selenium

Download Selenium JARs and Configure in Eclipse

Step 1: Go to the official website and click on **Download** tab. · Step 2: Click on **Download** link to **download** the **jars** for **selenium**. · Step 3: Extract the **downloaded** ...

https://jar-download.com › ... › selenium-java › 3.14.0

Download selenium-java JAR 3.14.0 With all dependencies!

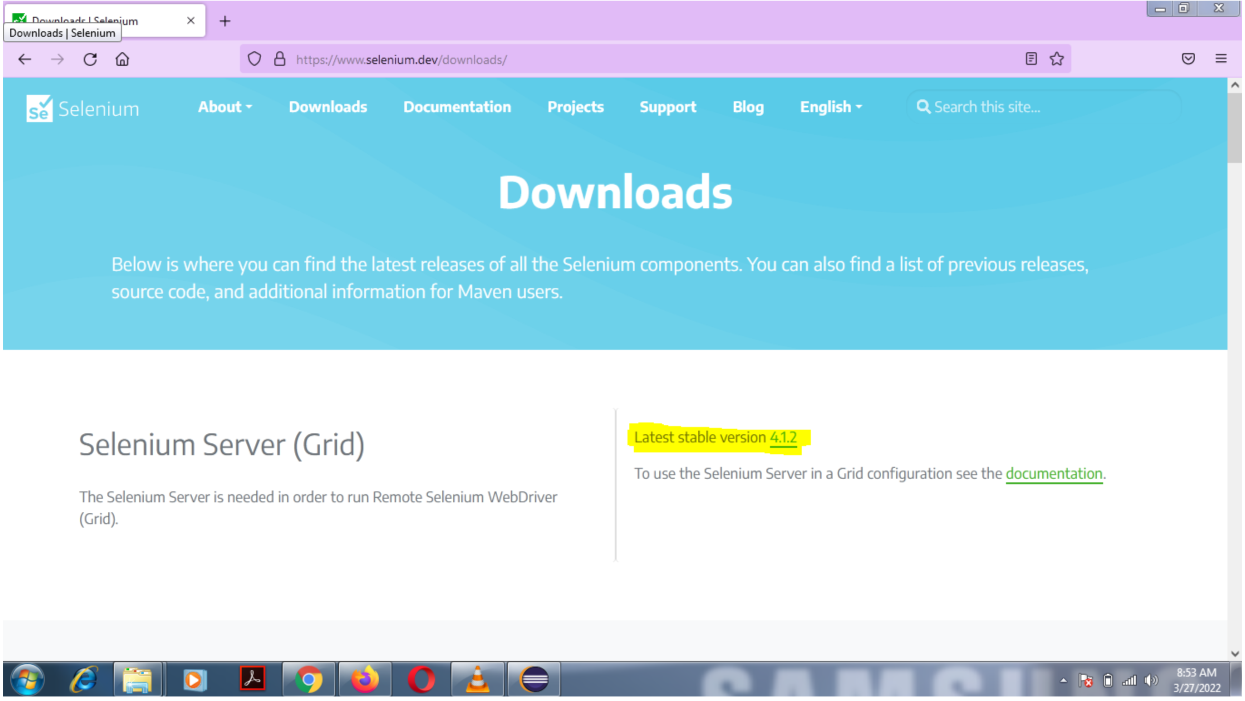
02-Aug-2018 — **Download selenium**-java **JAR** 3.14.0 with all dependencies. These are the **files** of the artifact **selenium**-java version 3.14.0 from the group ...

https://jar-download.com › search_box=selenium-java

Download selenium-java JAR files with all dependencies

Download JAR files for **selenium**-java ✓ With dependencies ✓ Documentation ✓ Source

c) Click on latest stable version 4.12 and download jar file (Selenium-server-4.1.2)



https://www.selenium.dev/downloads/

About Downloads Documentation Projects Support Blog English

Downloads

Below is where you can find the latest releases of all the Selenium components. You can also find a list of previous releases, source code, and additional information for Maven users.

Selenium Server (Grid)

The Selenium Server is needed in order to run Remote Selenium WebDriver (Grid).

Latest stable version 4.1.2

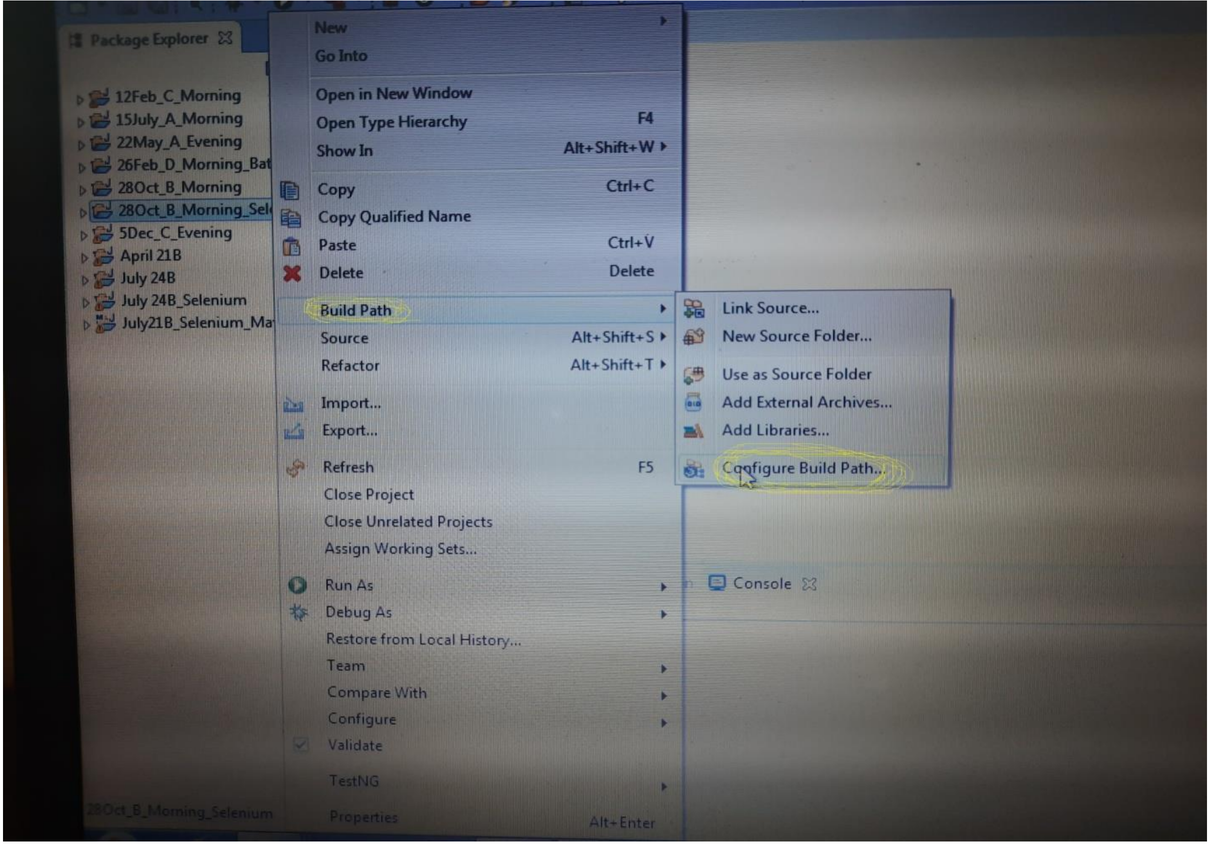
To use the Selenium Server in a Grid configuration see the documentation.

Step-III: Configure selenium jar file into our selenium project

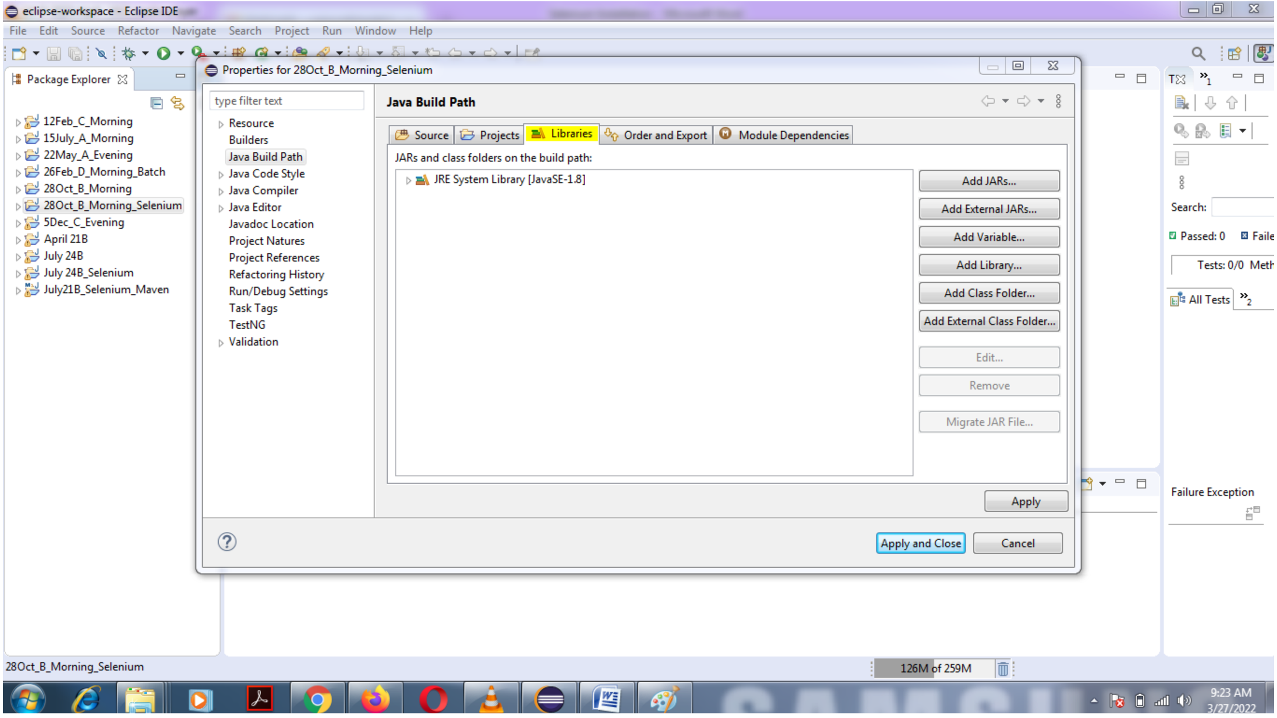
a) Right click on project

b) Select build path

c) Select configure build path



d) Click on libraries tab



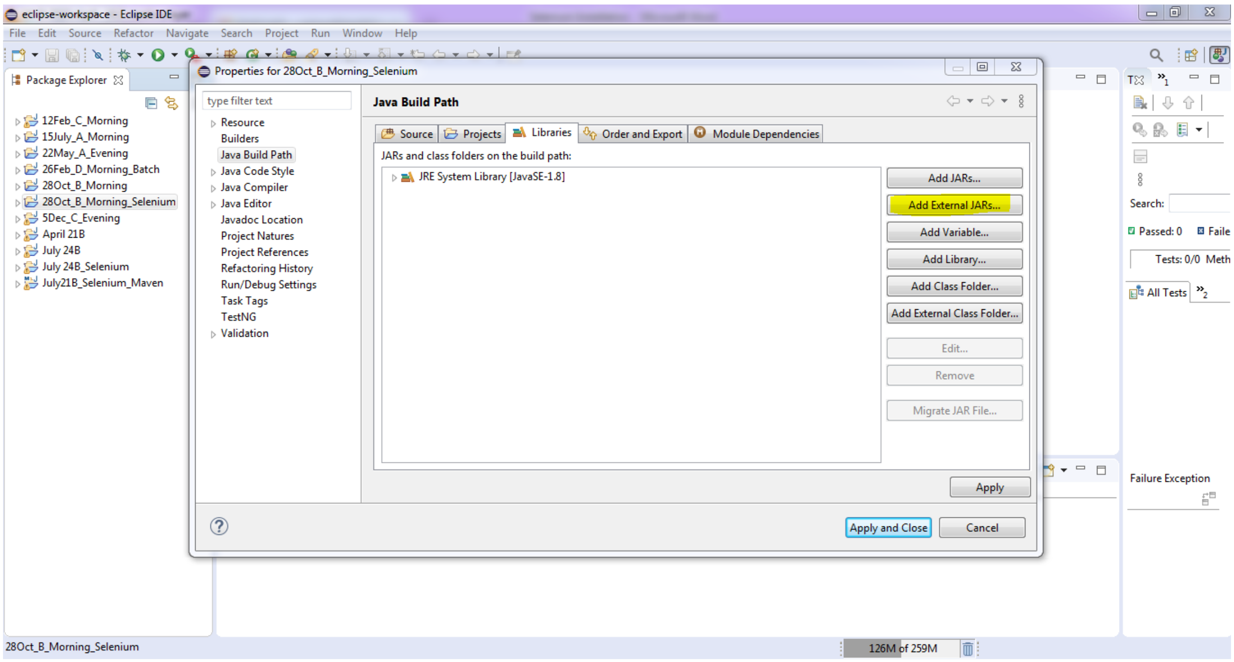
e) Click on Add External JARS

Note: If Add External JARS button is disabled then it will show 2 options in libraries window

Option-I: Module Path.

Option-II: Class Path.

Select Class Path, it will enable Add External JARS button



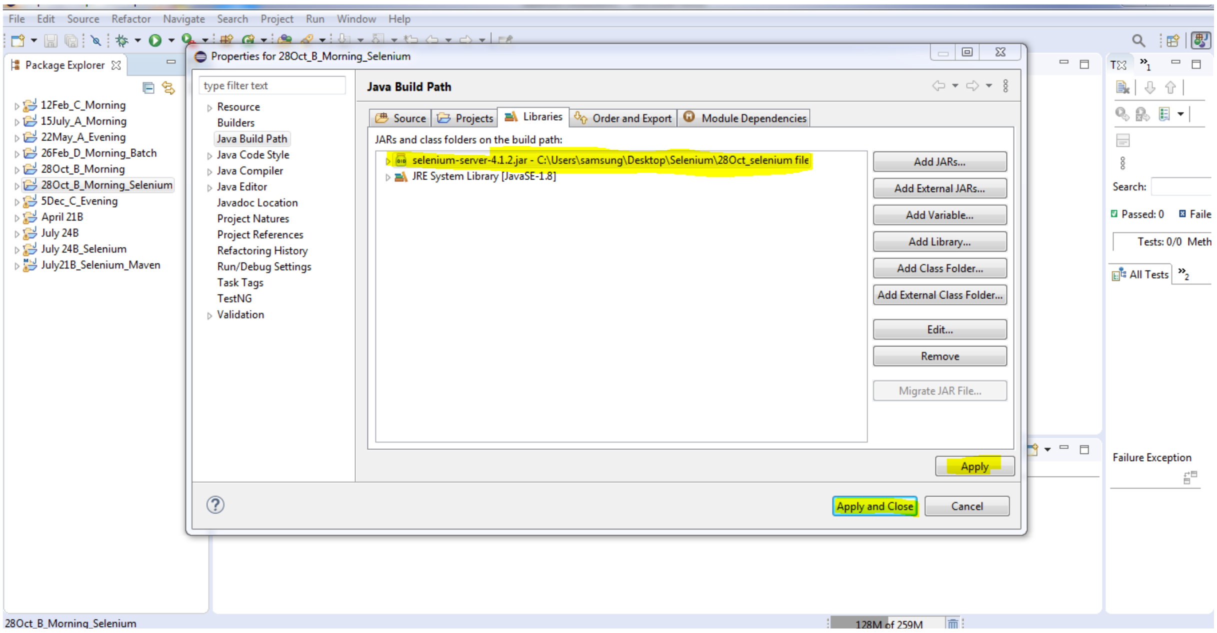
JARs and class folders on the build path:

JRE System Library [JavaSE-1.8]

f) Browse selenium jar file

g) Click on Apply

h) Click on Apply and close



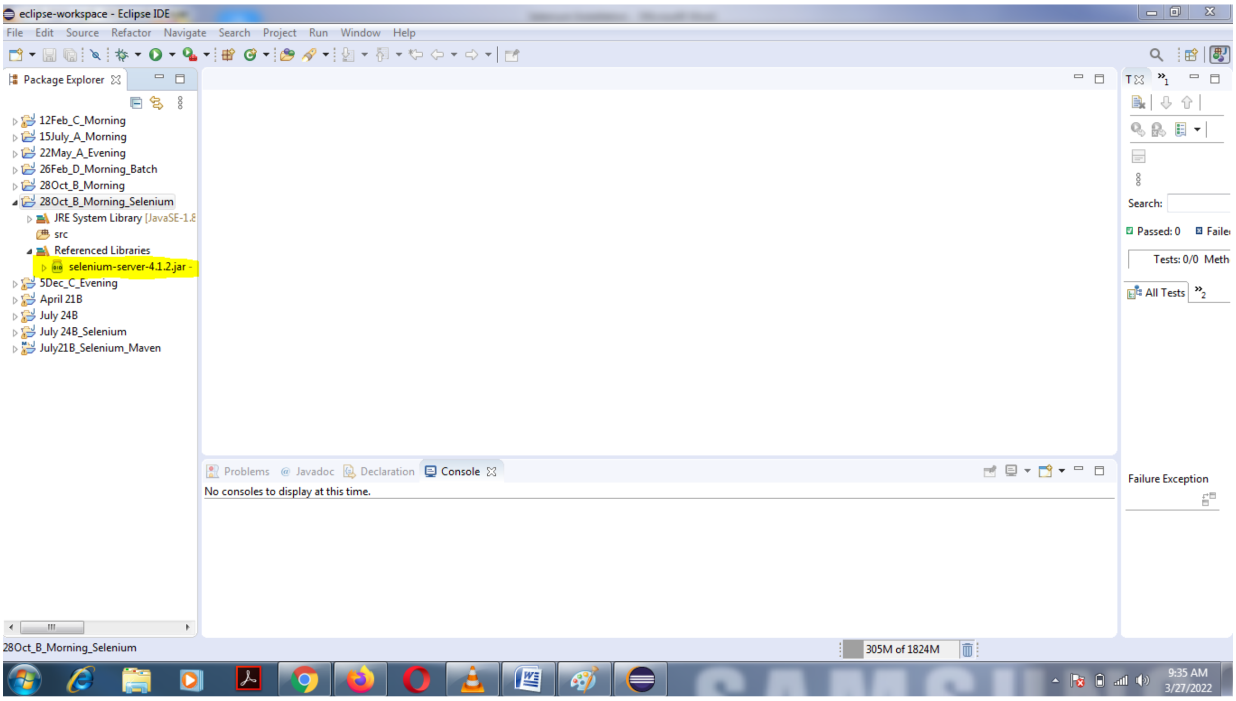
JARs and class folders on the build path:

selenium-server-4.1.2.jar - C:\Users\samsung\Desktop\Selenium\28Oct_selenium file

JRE System Library [JavaSE-1.8]

Step-IV: Check configuration of Selenium jar file

Expand folder and check selenium jar file



- 12Feb_C_Morning
- 15July_A_Morning
- 22May_A_Evening
- 26Feb_D_Morning_Batch
- 28Oct_B_Morning
- 28Oct_B_Morning_Selenium
  - JRE System Library [JavaSE-1.8
  - src
  - Referenced Libraries
    - selenium-server-4.1.2.jar -
- 5Dec_C_Evening
- April 21B
- July 24B
- July 24B_Selenium
- July21B_Selenium_Maven

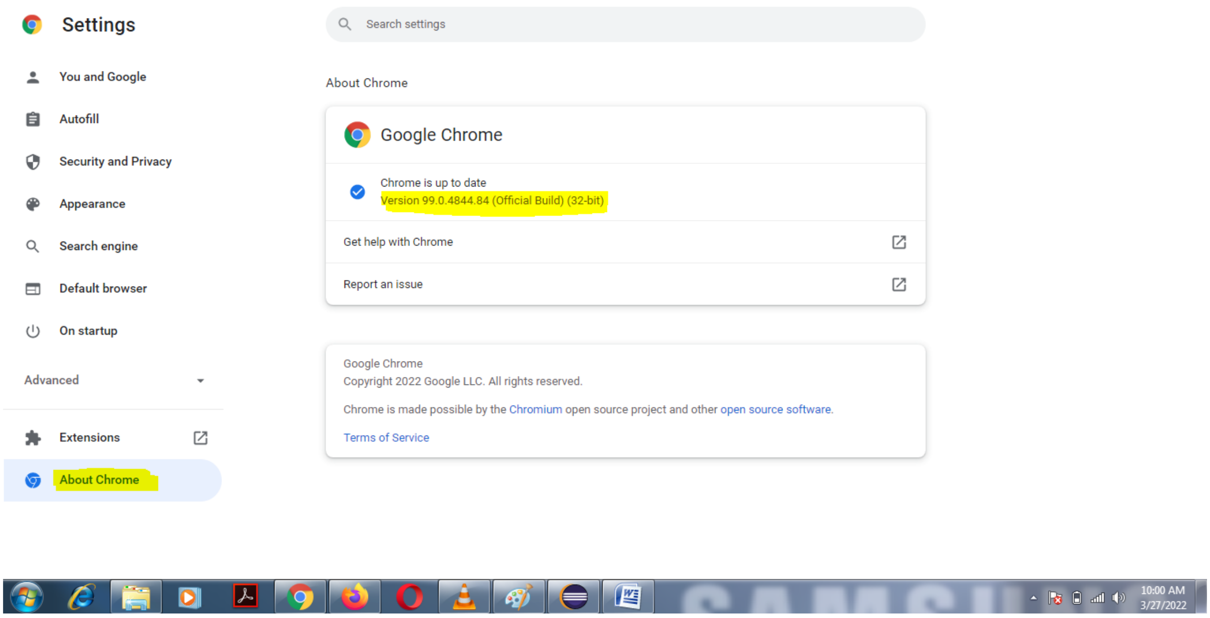
No consoles to display at this time.

28Oct_B_Morning_Selenium

Step-V: Download ChromeDriver.exe File

a) **Pre Condition:** Check Current Chrome browser version

Click on Right hand side top 3 dots of chrome--> Click on Settings-->Click on About Chrome



About Chrome

Google Chrome

Chrome is up to date

Version 99.0.4844.84 (Official Build) (32-bit)

Get help with Chrome

Report an issue

Google Chrome

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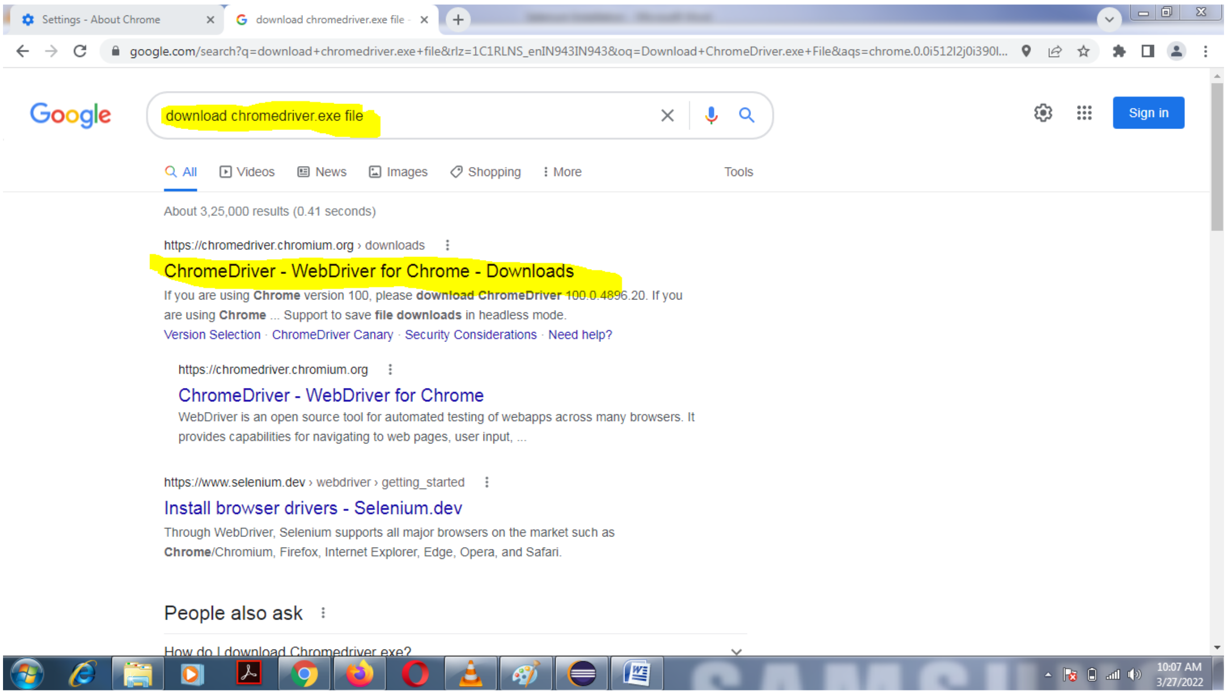
Chrome is made possible by the Chromium open source project and other open source software.

Terms of Service

b) Search **Download ChromeDriver.exe File** and Click on **ChromeDriver- WbDriver for Chrome-Downloads**



google.com/search?q=download+chromedriver.exe+file&rlz=1C1RLNS_enIN943IN943&oq=Download+ChromeDriver.exe+File&aqs=chrome.0.0i512l2j0i390l...

download chromedriver.exe file

About 3,25,000 results (0.41 seconds)

https://chromedriver.chromium.org › downloads

ChromeDriver - WebDriver for Chrome - Downloads

If you are using **Chrome** version 100, please **download ChromeDriver** 100.0.4896.20. If you are using **Chrome** ... Support to save **file downloads** in headless mode.

Version Selection · ChromeDriver Canary · Security Considerations · Need help?

https://chromedriver.chromium.org

ChromeDriver - WebDriver for Chrome

WebDriver is an open source tool for automated testing of webapps across many browsers. It provides capabilities for navigating to web pages, user input, ...

https://www.selenium.dev › webdriver › getting_started

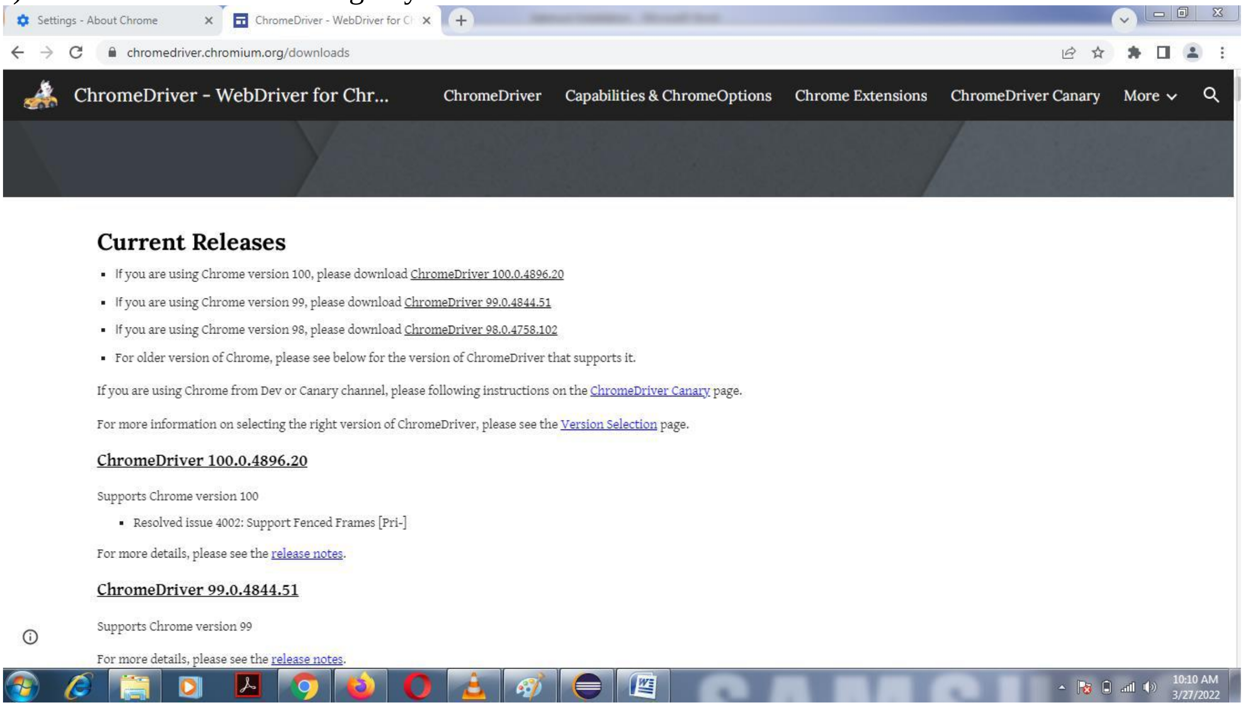
Install browser drivers - Selenium.dev

Through WebDriver, Selenium supports all major browsers on the market such as **Chrome**/Chromium, Firefox, Internet Explorer, Edge, Opera, and Safari.

People also ask

How do I download Chromedriver.exe?

c) Click on the link according to your version


Settings - About Chrome
ChromeDriver - WebDriver for Chrome
chromedriver.chromium.org/downloads
ChromeDriver - WebDriver for Chr...
ChromeDriver
Capabilities & ChromeOptions
Chrome Extensions
ChromeDriver Canary
More
10:10 AM
3/27/2022

Current Releases

- If you are using Chrome version 100, please download ChromeDriver 100.0.4896.20
- If you are using Chrome version 99, please download ChromeDriver 99.0.4844.51
- If you are using Chrome version 98, please download ChromeDriver 98.0.4758.102
- For older version of Chrome, please see below for the version of ChromeDriver that supports it.

If you are using Chrome from Dev or Canary channel, please following instructions on the ChromeDriver Canary page.

For more information on selecting the right version of ChromeDriver, please see the Version Selection page.

ChromeDriver 100.0.4896.20

Supports Chrome version 100

- Resolved issue 4002: Support Fenced Frames [Pri-]

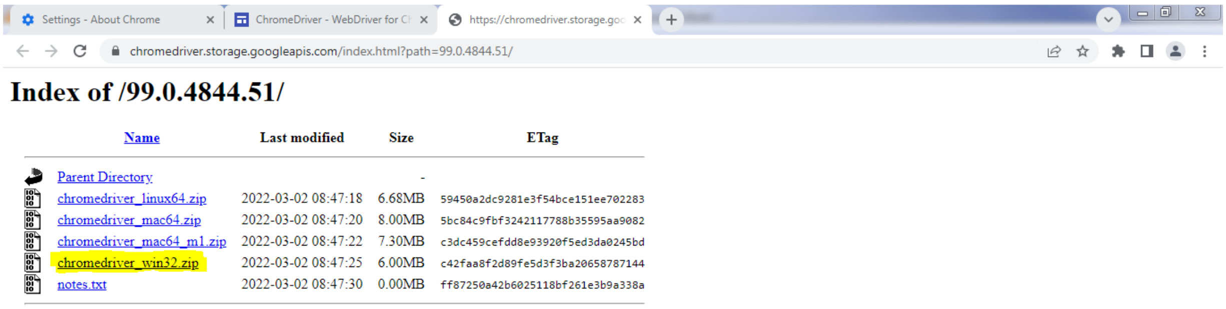
For more details, please see the release notes.

ChromeDriver 99.0.4844.51

Supports Chrome version 99

For more details, please see the release notes.

d) Select **chromedriver_win32.zip** and download **chromedriver_win32.zip File**



Settings - About Chrome
ChromeDriver - WebDriver for Ch
https://chromedriver.storage.goo
chromedriver.storage.googleapis.com/index.html?path=99.0.4844.51/

Index of /99.0.4844.51/

Name	Last modified	Size	ETag
Parent Directory		-	
chromedriver_linux64.zip	2022-03-02 08:47:18	6.68MB	59450a2dc9281e3f54bce151ee702283
chromedriver_mac64.zip	2022-03-02 08:47:20	8.00MB	5bc84c9fbf3242117788b35595aa9082
chromedriver_mac64_m1.zip	2022-03-02 08:47:22	7.30MB	c3dc459cefdd8e93920f5ed3da0245bd
chromedriver_win32.zip	2022-03-02 08:47:25	6.00MB	c42faa8f2d89fe5d3f3ba20658787144
notes.txt	2022-03-02 08:47:30	0.00MB	ff87250a42b6025118bf261e3b9a338a

e) Unzip **chromedriver_win32.zip File**

1st Selenium Program: Open Browser

Step-I: Set ChromeDriver.exe file path by using System.setProperty(Parameter-I, Parameter-II)
Parameter-I: Name of the Browser(Small letter)
Parameter-II: Path of the Browser(Convert \ to\\)
Step-II: Create object of ChromeDriver class