# American International University-Bangladesh (AIUB)

## Department of Computer Science and Engineering

## Course: Software Quality and Testing
## Section: A
## Fall 2021-22

## Course Teacher: Abhijit Bhowmik

## Title: Assignment on Selenium.

| Name | ID |
|---|---|
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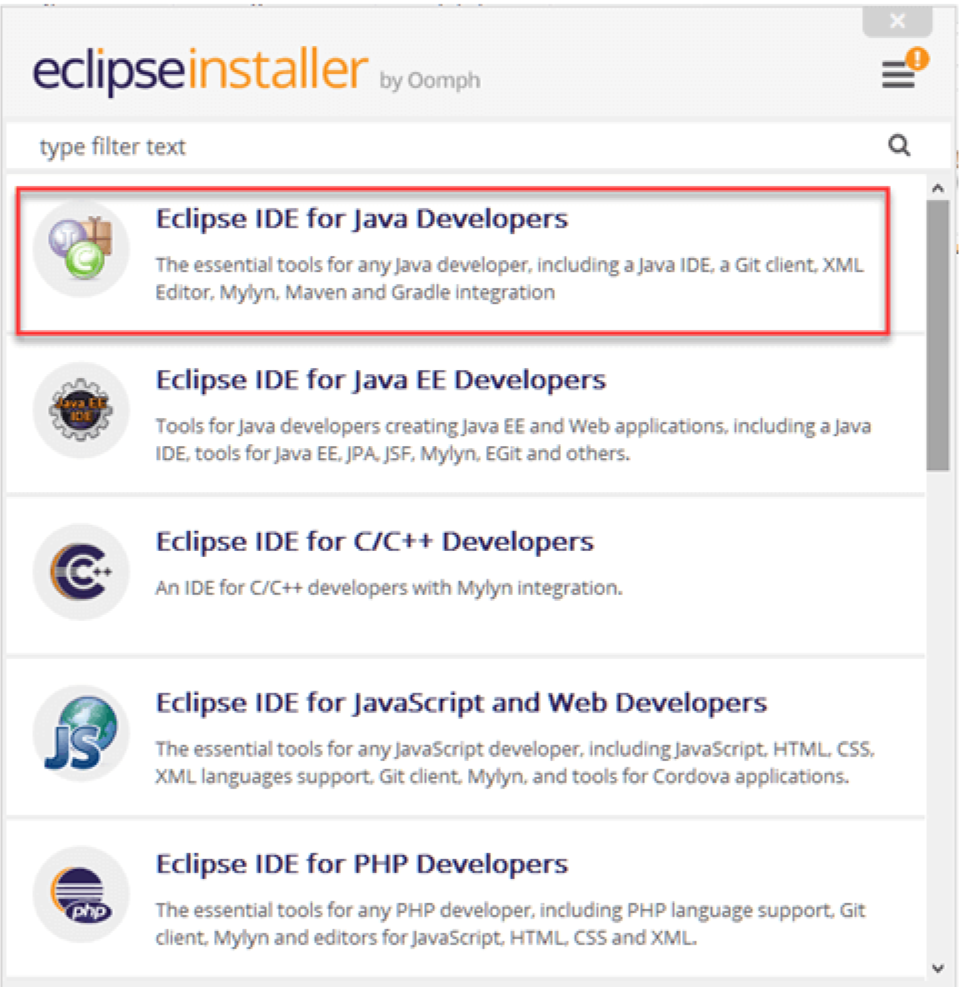
## Answer to the ques no. 1

To define Selenium, it is one of the most renowned open source, test automation framework developed by Thought works to facilitate automated cross browser testing with ease.
In this entire report we will be covering some screenshots of selenium and other tools installations and also go through the test case report in the later part indeed.

**Eclipse Installation:**



**Eclipse IDE for Java Developers**

The essential tools for any Java developer, including a Java IDE, a Git client, XML Editor, Mylyn, Maven and Gradle integration

**Eclipse IDE for Java EE Developers**

Tools for Java developers creating Java EE and Web applications, including a Java IDE, tools for Java EE, JPA, JSF, Mylyn, EGit and others.

**Eclipse IDE for C/C++ Developers**

An IDE for C/C++ developers with Mylyn integration.

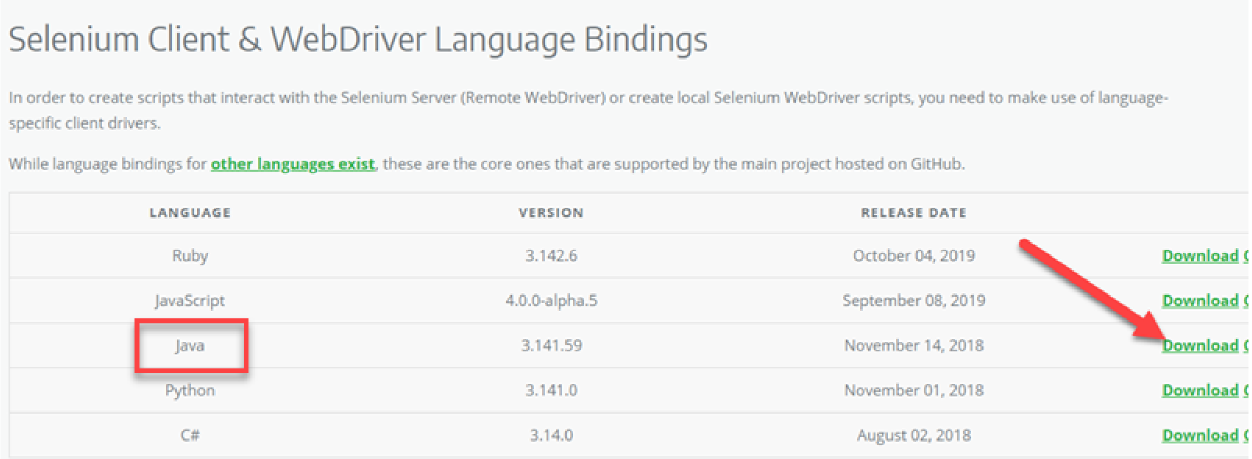
**Eclipse IDE for JavaScript and Web Developers**

The essential tools for any JavaScript developer, including JavaScript, HTML, CSS, XML languages support, Git client, Mylyn, and tools for Cordova applications.

**Eclipse IDE for PHP Developers**

The essential tools for any PHP developer, including PHP language support, Git client, Mylyn and editors for JavaScript, HTML, CSS and XML.

**Download Selenium java client driver and browser drivers:**

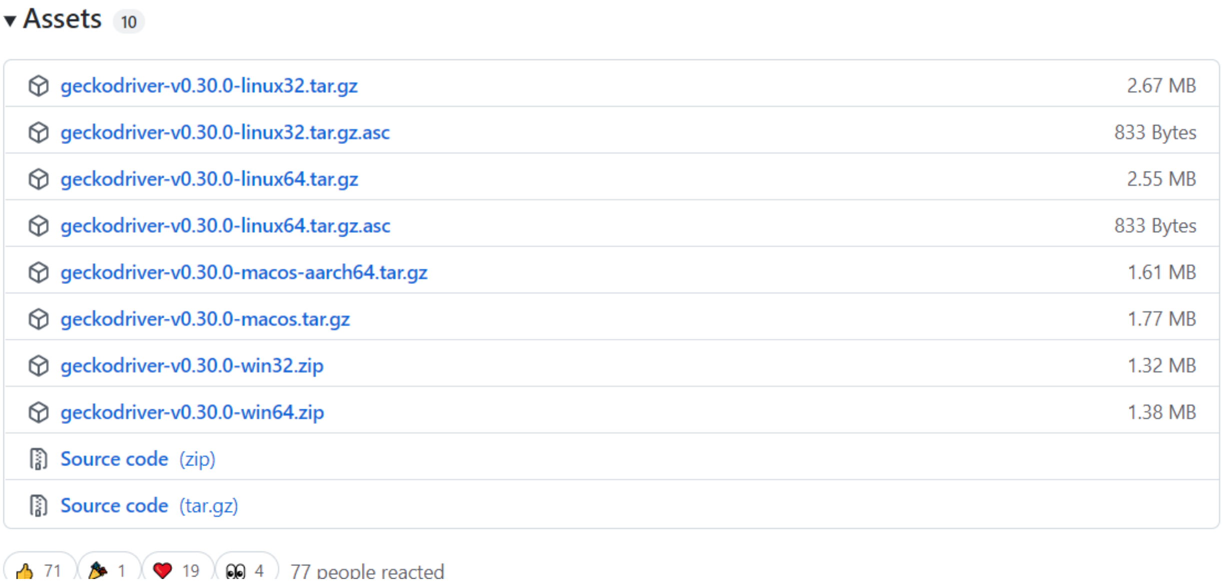


Selenium Client & WebDriver Language Bindings

In order to create scripts that interact with the Selenium Server (Remote WebDriver) or create local Selenium WebDriver scripts, you need to make use of language-specific client drivers.

While language bindings for **other languages exist**, these are the core ones that are supported by the main project hosted on GitHub.

| LANGUAGE | VERSION | RELEASE DATE | |
|---|---|---|---|
| Ruby | 3.142.6 | October 04, 2019 | Download |
| JavaScript | 4.0.0-alpha.5 | September 08, 2019 | Download |
| Java | 3.141.59 | November 14, 2018 | Download |
| Python | 3.141.0 | November 01, 2018 | Download |
| C# | 3.14.0 | August 02, 2018 | Download |



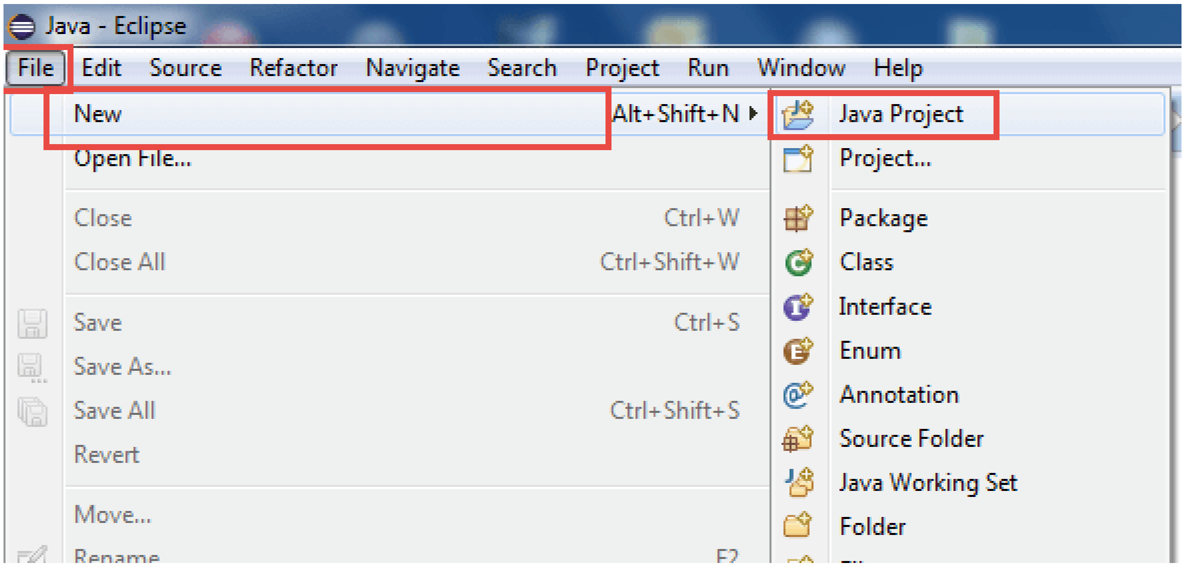
▾ Assets 10

| | |
|---|---|
| geckodriver-v0.30.0-linux32.tar.gz | 2.67 MB |
| geckodriver-v0.30.0-linux32.tar.gz.asc | 833 Bytes |
| geckodriver-v0.30.0-linux64.tar.gz | 2.55 MB |
| geckodriver-v0.30.0-linux64.tar.gz.asc | 833 Bytes |
| geckodriver-v0.30.0-macos-aarch64.tar.gz | 1.61 MB |
| geckodriver-v0.30.0-macos.tar.gz | 1.77 MB |
| geckodriver-v0.30.0-win32.zip | 1.32 MB |
| geckodriver-v0.30.0-win64.zip | 1.38 MB |
| Source code (zip) | |
| Source code (tar.gz) | |

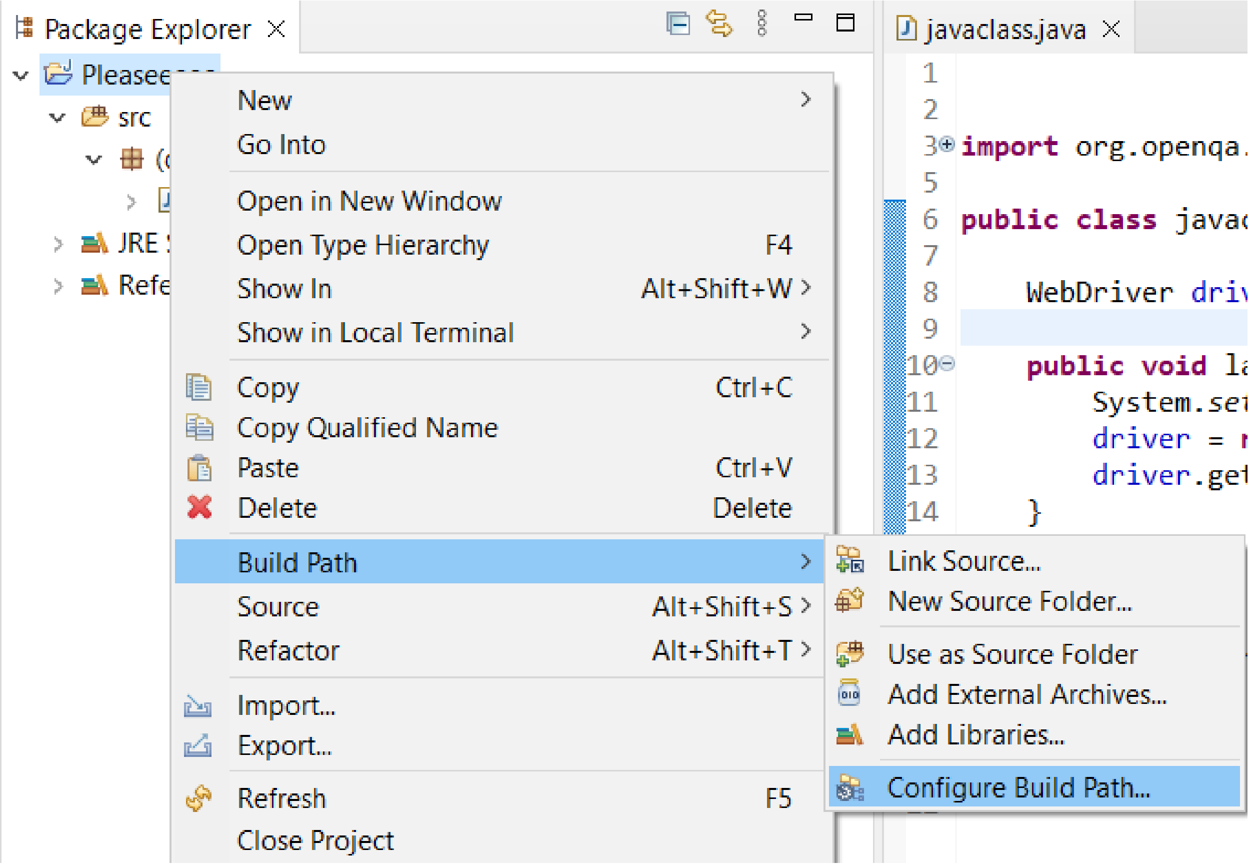
These file have to be unzipped after downloading.

### Configuring Eclipse IDE with WebDriver:

I’ll first create a java project.

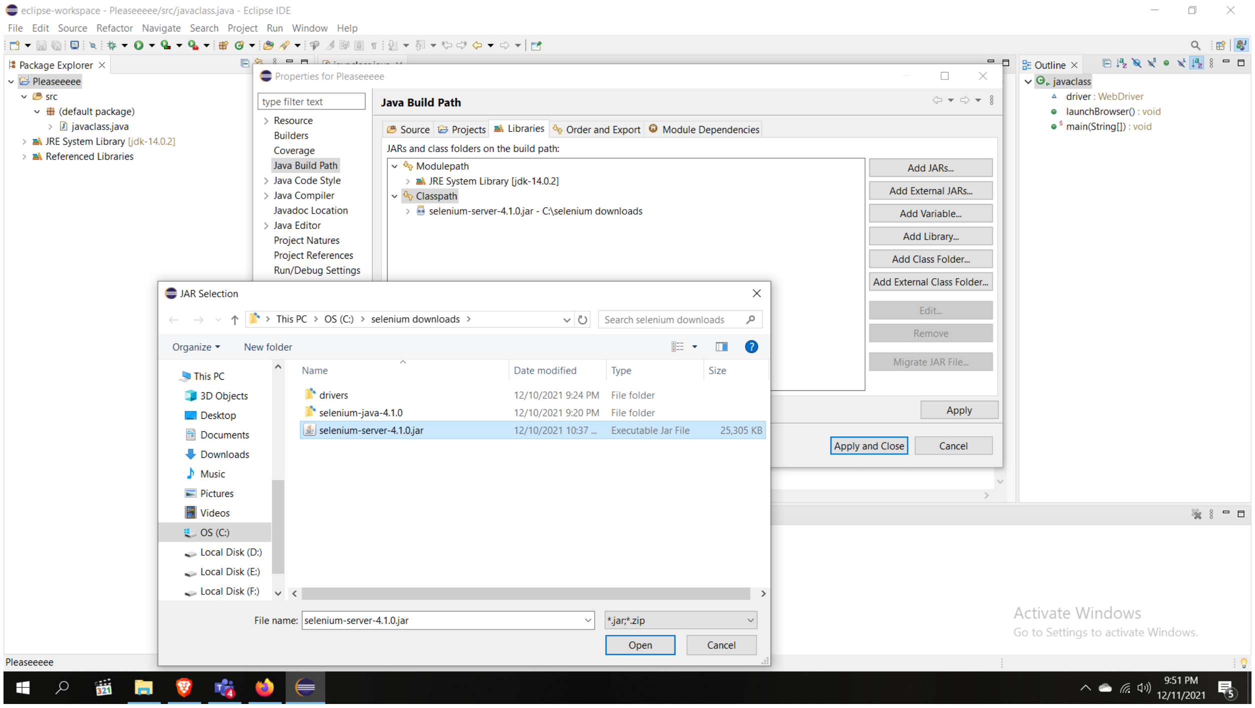


Now I’ll configure the build path of the java project.



```
import org.openqa.

public class javac

    WebDriver driv

    public void la
        System.set
        driver = n
        driver.get
    }
```

By clicking “Configure Build Path” we will be adding external jar latest selenium server for the classpath. Then click “Apply and Close”



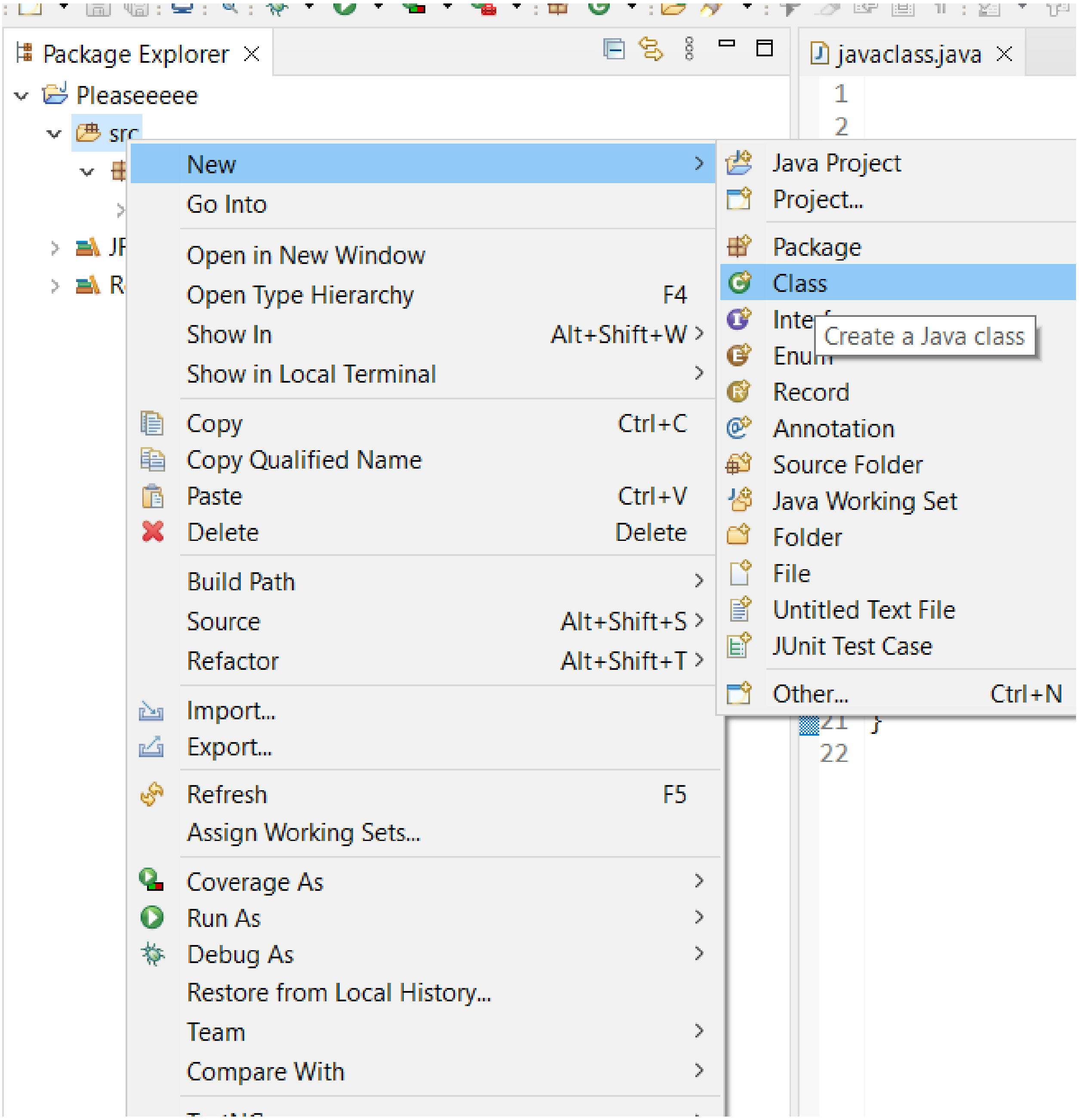
JARs and class folders on the build path:

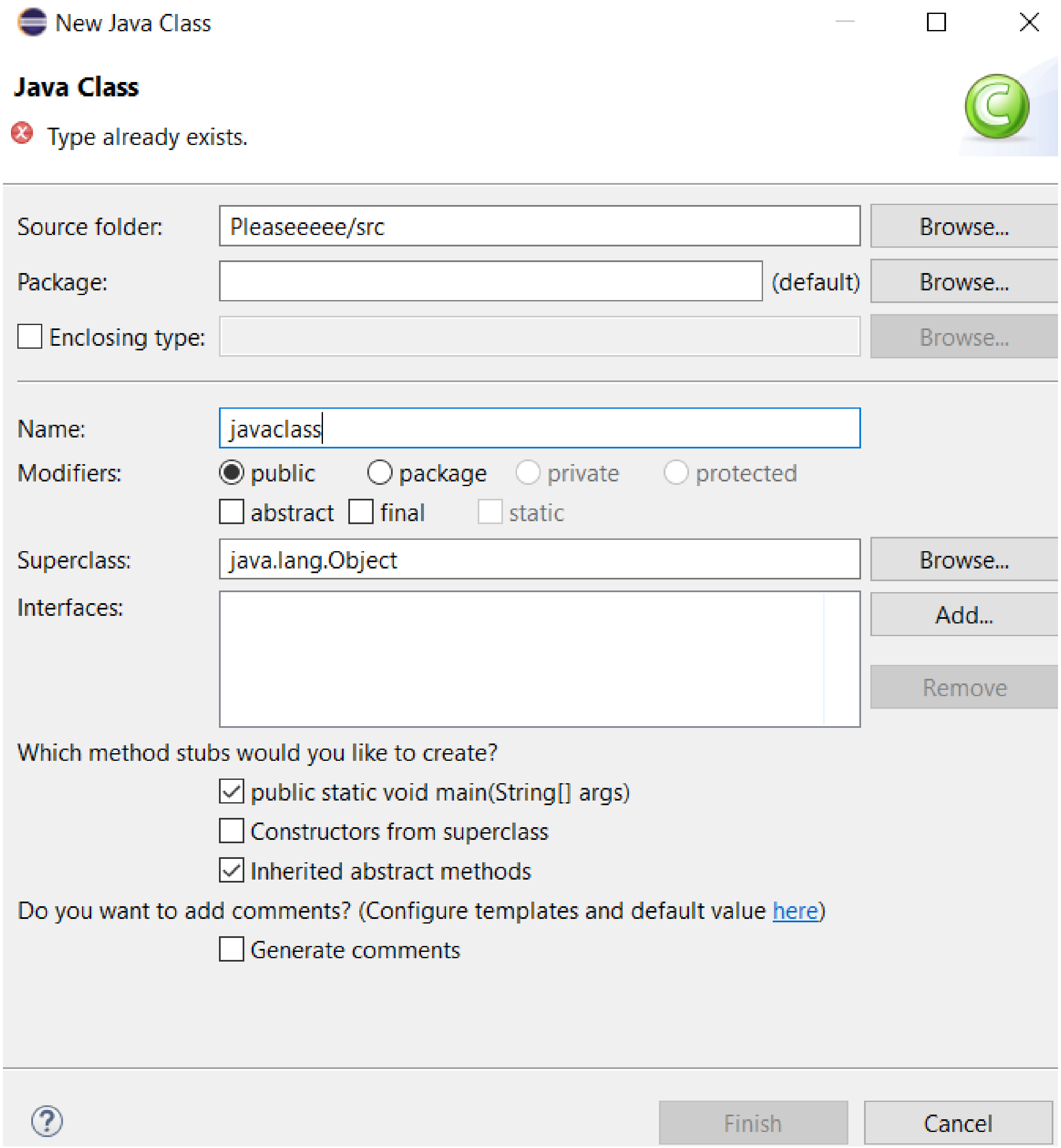
- Modulepath
  - JRE System Library [jdk-14.0.2]
- Classpath
  - selenium-server-4.1.0.jar - C:\selenium downloads

| Name | Date modified | Type | Size |
|---|---|---|---|
| drivers | 12/10/2021 9:24 PM | File folder | |
| selenium-java-4.1.0 | 12/10/2021 9:20 PM | File folder | |
| selenium-server-4.1.0.jar | 12/10/2021 10:37 ... | Executable Jar File | 25,305 KB |

File name: selenium-server-4.1.0.jar  *.jar;*.zip

Now from “src”, right clicking will give us the option to create a new class.





New Java Class

**Java Class**

Type already exists.

Source folder: Pleaseeeee/src

Package: (default)

□ Enclosing type:

Name: javaclass

Modifiers: ● public ○ package ○ private ○ protected

□ abstract □ final □ static

Superclass: java.lang.Object

Interfaces:

Which method stubs would you like to create?

☑ public static void main(String[] args)

□ Constructors from superclass

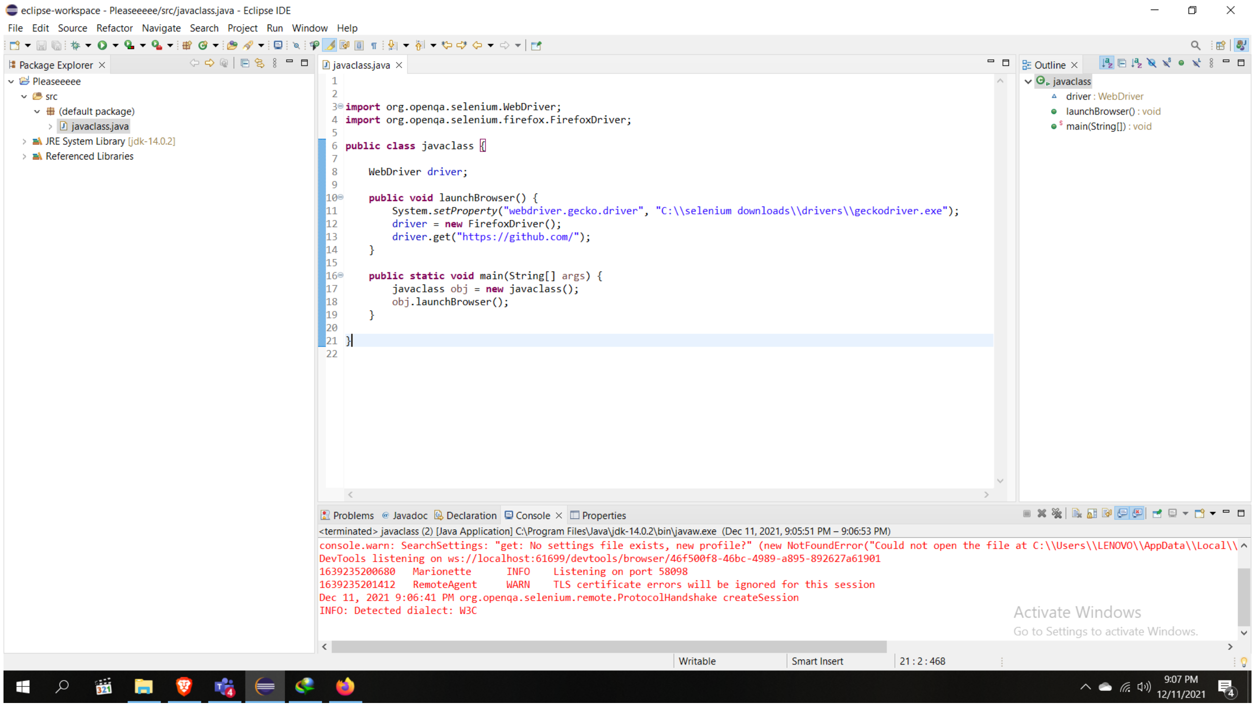
☑ Inherited abstract methods

Do you want to add comments? (Configure templates and default value here)

□ Generate comments

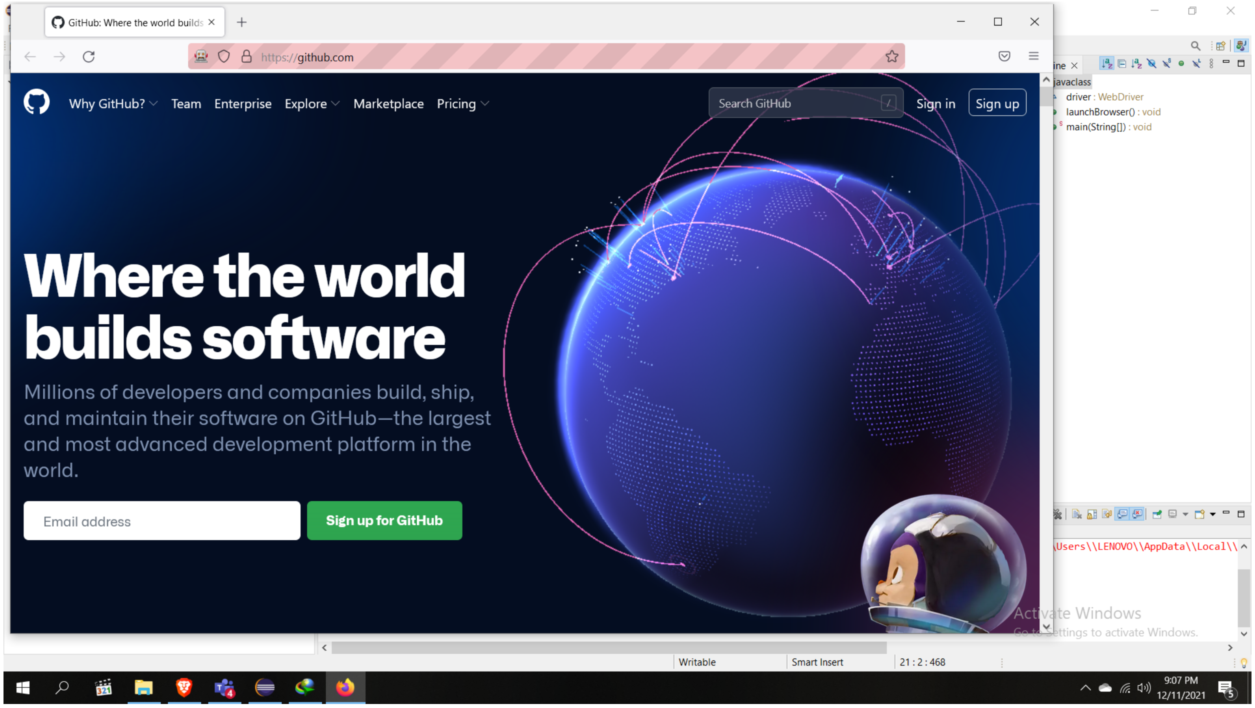
Clicking finish will get us all set to start with Selenium. **(N.B:Here we created the class before so the button isn’t enabled now.)**

Our first go with Selenium is given below:



```


import org.openqa.selenium.WebDriver;
import org.openqa.selenium.firefox.FirefoxDriver;

public class javaclass {

    WebDriver driver;

    public void launchBrowser() {
        System.setProperty("webdriver.gecko.driver", "C:\\selenium downloads\\drivers\\geckodriver.exe");
        driver = new FirefoxDriver();
        driver.get("https://github.com/");
    }

    public static void main(String[] args) {
        javaclass obj = new javaclass();
        obj.launchBrowser();
    }

}

```

```
<terminated> javaclass (2) [Java Application] C:\Program Files\Java\jdk-14.0.2\bin\javaw.exe  (Dec 11, 2021, 9:05:51 PM – 9:06:53 PM)
console.warn: SearchSettings: "get: No settings file exists, new profile?" (new NotFoundError("Could not open the file at C:\\Users\\LENOVO\\AppData\\Local\\
DevTools listening on ws://localhost:61699/devtools/browser/46f500f8-46bc-4989-a895-892627a61901
1639235200680   Marionette      INFO    Listening on port 58098
1639235201412   RemoteAgent     WARN    TLS certificate errors will be ignored for this session
Dec 11, 2021 9:06:41 PM org.openqa.selenium.remote.ProtocolHandshake createSession
INFO: Detected dialect: W3C
```



Where the world builds software

Millions of developers and companies build, ship, and maintain their software on GitHub—the largest and most advanced development platform in the world.

# Answer to the ques no. 2

Let's take a look at what Selenium is and why it's utilized before we get into the benefits.

Selenium is an open-source automation testing tool that may be used to automate tests on a variety of web browsers. It has a set of tools that cater to various organizational demands. It mostly consists of four tools:
1. Selenium RC (which is now deprecated)
2. Selenium IDE (Selenium Integrated Development Environment)
3. Selenium Grid
4. Selenium WebDriver

Selenium WebDriver and Grid are currently merged into one, and this is what we'll be discussing in this article.
Selenium is a tool for automating testing across many web browsers. Selenium WebDriver supports a variety of browsers, including Chrome, Mozilla, Firefox, Safari, and Internet Explorer, and allows you to simply automate browser testing across different browsers. On our computer screen, we can observe live automated tests being run. However, because there are so many tools for automation testing, the question we'll be answering in this article still stands. The most widely used freeware and open-source automation tool is Selenium. Selenium has a lot of advantages when it comes to test automation. It also allows for recording and playback for testing web applications, as well as the execution of numerous scripts across multiple browsers. Amongst all, some particular reasons why selenium is more preferable nowadays are as follows:

- Language and Framework Support:

The first question that comes to mind when selecting a tool is, "Does my tool support the language that I am familiar with?" Selenium, on the other hand, supports all main programming languages for software test automation, including Java, Python, JavaScript, C#, Ruby, and Perl. You can write your scripts in any of these programming languages, and Selenium will automatically convert them to Selenium compatible code. As a result, understanding only Selenium languages is not required. In addition, every Selenium supported language includes dedicated frameworks that aid in the creation of Selenium test scripts. So, if you choose Selenium as an automation testing tool, you won't have to worry about language or framework support because Selenium takes care of that for you.

- Open-Source Availability:

The fact that Selenium is open-source is just one of the numerous benefits it offers. Selenium is a publicly available automation framework that is free with no upfront expenses because it is an opensource tool. As a result, you can save money and use it towards other good causes. The Selenium community is always willing to assist developers and software engineers with automating web browser capabilities and functions. Because Selenium is open source, you can modify the code for better code management and to improve the functionality of predefined methods and classes. Because it's so simple to create test scripts to evaluate functionality, Selenium has become the most trusted web automation tool.

- Support for multiple browser:

Every day, the Selenium community has been working on and improving "one Selenium script for all browsers." According to Stat Counter, the most popular browsers in the world are Chrome, Firefox, Safari, Internet Explorer, Opera, and Edge, and the Selenium script is compatible with all of them. You don't need to rewrite scripts for each browser; instead, you may use a single script for all of them.

- Support for a wide range of operating system:

Different operating systems are used by different people; thus, your automation tool must handle all of them. Selenium is a very portable program that works on a variety of operating systems, including Windows, Linux, Mac OS, UNIX, and others. You can write Selenium test suites on any platform, such as Windows, and then run them on another platform, such as Mac or Linux. This makes it simple for developers and software testers to design test automation scripts without having to worry about the platform they'll be running on.

- Implementation ease:

The Selenium automation framework is a user-friendly tool. Selenium has a user-friendly interface that makes it simple to build and execute test scripts. You can also keep an eye on the tests as they run. You can review detailed Selenium test reports and take action based on them.

- Integrations and reusability:

Selenium automation test suites, as previously said, are reusable and may be run on a variety of browsers and operating systems. The catch is that Selenium isn't a one-size-fits-all web automation testing solution. As a result, third-party frameworks and add-ons are required to expand the testing scope. For example, to manage test cases and generate reports, Selenium must be integrated with TestNG and JUnit. You'll need to combine it with CI/CD systems like Jenkins, Maven, and Docker to achieve continuous testing. You'll also need to link Selenium with tools like Sikuli for image-based testing, and cloud-grid tools like Lambda Test for cross-browser testing. Almost all management tools can be integrated with Selenium.

- Flexibility:

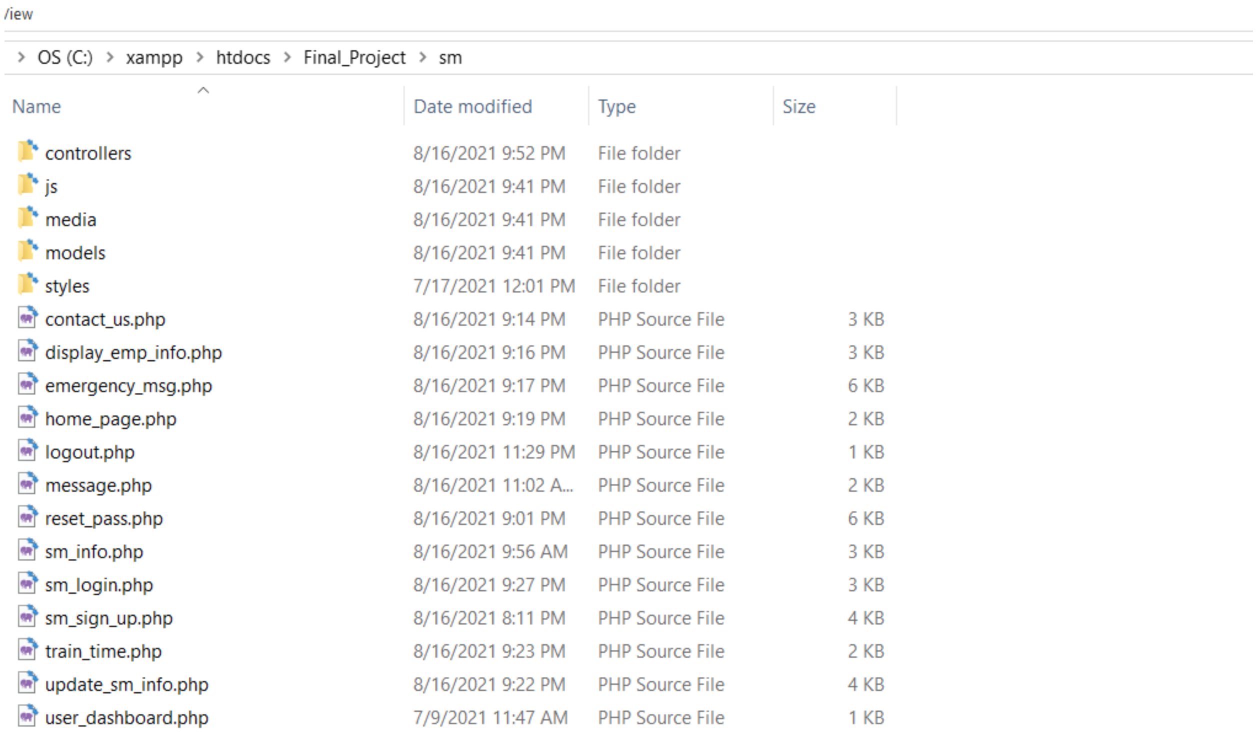
The importance of test management in the testing lifecycle cannot be overstated. Selenium capabilities such as test case regrouping and refactoring make it easier and more efficient. This aids developers and testers in making quick code changes, eliminating duplication, decreasing complexity, and increasing maintainability. These qualities make Selenium more adaptable and usable than competing automation testing solutions, allowing it to maintain its competitive advantage

- Regular updates:

Because Selenium is backed by a community, and we all know that an active community doesn't like to stagnate, the Selenium community releases frequent updates and upgrades. The nice aspect about having a community is that these changes are easily available and simple to comprehend, so no special training is required. Selenium is therefore more resourceful and cost-effective than other tools.

## **Answer to the ques no. 3**

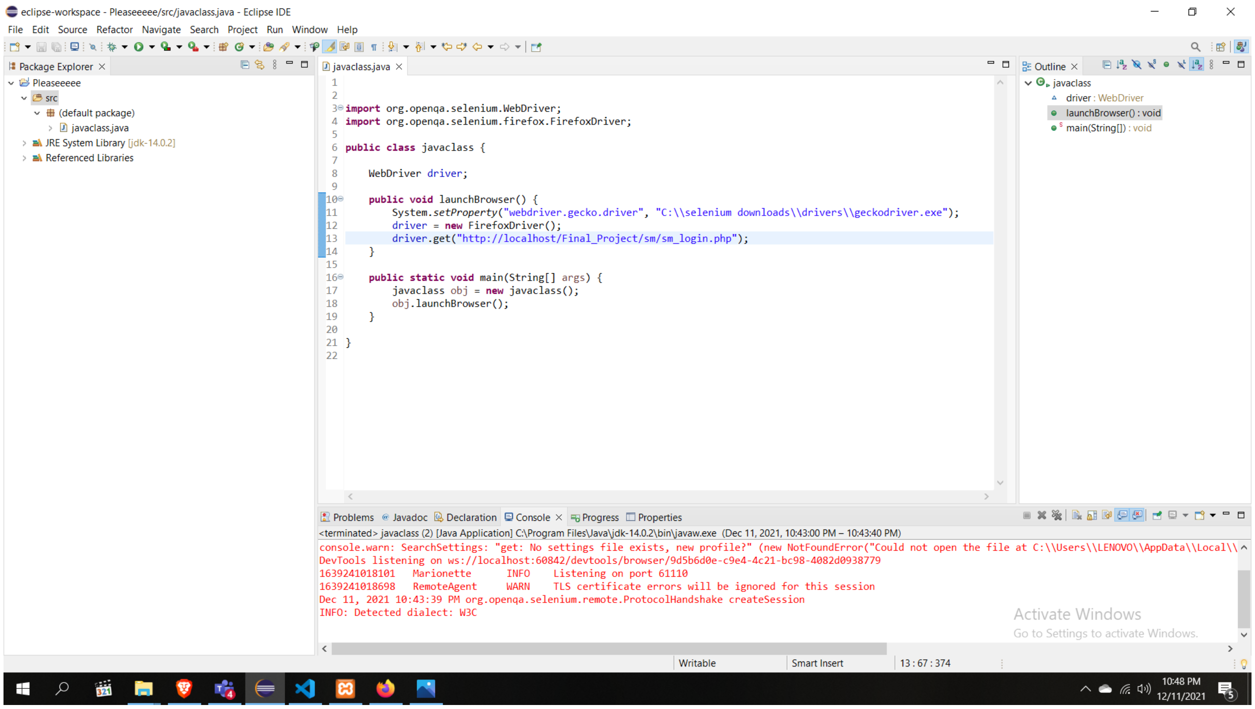
All the project screenshots are provided here to test the automation with Selenium:



> OS (C:) > xampp > htdocs > Final_Project > sm

| Name | Date modified | Type | Size |
|---|---|---|---|
| controllers | 8/16/2021 9:52 PM | File folder | |
| js | 8/16/2021 9:41 PM | File folder | |
| media | 8/16/2021 9:41 PM | File folder | |
| models | 8/16/2021 9:41 PM | File folder | |
| styles | 7/17/2021 12:01 PM | File folder | |
| contact_us.php | 8/16/2021 9:14 PM | PHP Source File | 3 KB |
| display_emp_info.php | 8/16/2021 9:16 PM | PHP Source File | 3 KB |
| emergency_msg.php | 8/16/2021 9:17 PM | PHP Source File | 6 KB |
| home_page.php | 8/16/2021 9:19 PM | PHP Source File | 2 KB |
| logout.php | 8/16/2021 11:29 PM | PHP Source File | 1 KB |
| message.php | 8/16/2021 11:02 A... | PHP Source File | 2 KB |
| reset_pass.php | 8/16/2021 9:01 PM | PHP Source File | 6 KB |
| sm_info.php | 8/16/2021 9:56 AM | PHP Source File | 3 KB |
| sm_login.php | 8/16/2021 9:27 PM | PHP Source File | 3 KB |
| sm_sign_up.php | 8/16/2021 8:11 PM | PHP Source File | 4 KB |
| train_time.php | 8/16/2021 9:23 PM | PHP Source File | 2 KB |
| update_sm_info.php | 8/16/2021 9:22 PM | PHP Source File | 4 KB |
| user_dashboard.php | 7/9/2021 11:47 AM | PHP Source File | 1 KB |

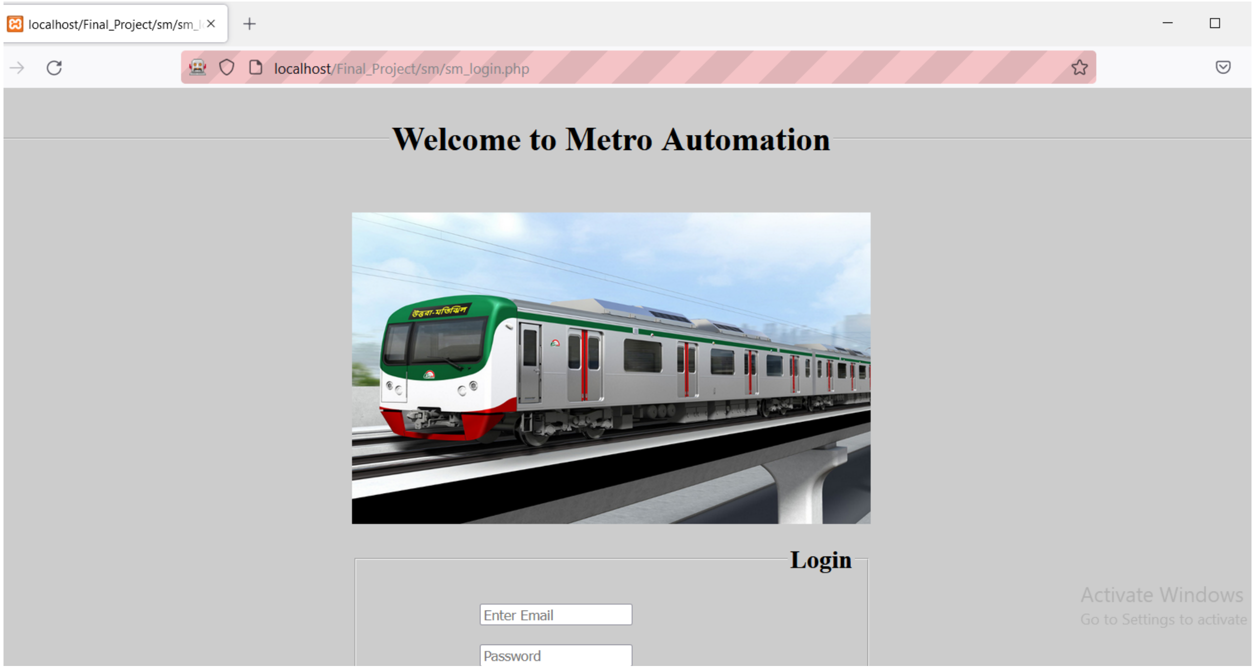
Project directory



```java


import org.openqa.selenium.WebDriver;
import org.openqa.selenium.firefox.FirefoxDriver;

public class javaclass {

    WebDriver driver;

    public void launchBrowser() {
        System.setProperty("webdriver.gecko.driver", "C:\\selenium downloads\\drivers\\geckodriver.exe");
        driver = new FirefoxDriver();
        driver.get("http://localhost/Final_Project/sm/sm_login.php");
    }

    public static void main(String[] args) {
        javaclass obj = new javaclass();
        obj.launchBrowser();
    }

}

```

```
<terminated> javaclass (2) [Java Application] C:\Program Files\Java\jdk-14.0.2\bin\javaw.exe  (Dec 11, 2021, 10:43:00 PM – 10:43:40 PM)
console.warn: SearchSettings: "get: No settings file exists, new profile?" (new NotFoundError("Could not open the file at C:\\Users\\LENOVO\\AppData\\Local\\
DevTools listening on ws://localhost:60842/devtools/browser/9d5b6d0e-c9e4-4c21-bc98-4082d0938779
1639241018101   Marionette      INFO    Listening on port 61110
1639241018698   RemoteAgent     WARN    TLS certificate errors will be ignored for this session
Dec 11, 2021 10:43:39 PM org.openqa.selenium.remote.ProtocolHandshake createSession
INFO: Detected dialect: W3C
```

Activate Windows
Go to Settings to activate Windows.



localhost/Final_Project/sm/sm_l
localhost/Final_Project/sm/sm_login.php
উত্তরা-মতিঝিল
Activate Windows
Go to Settings to activate

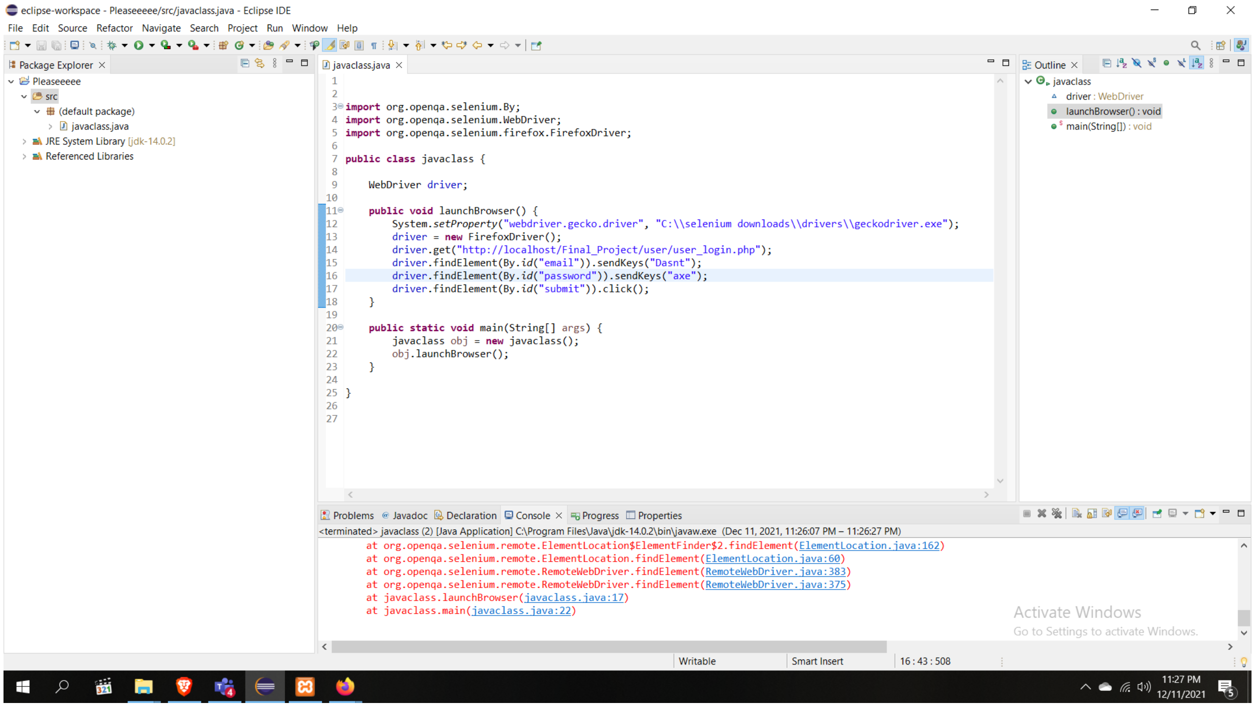
Welcome to Metro Automation

Login

Enter Email

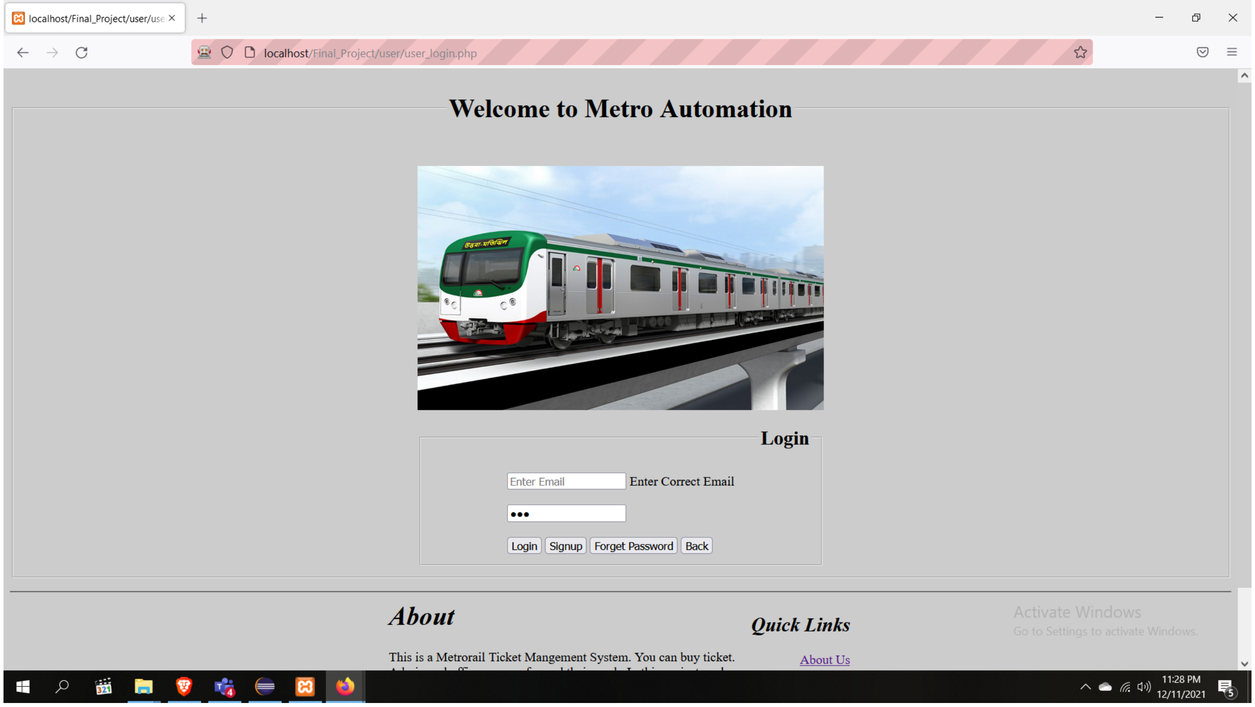
Password

Code and execution for testing



```java


import org.openqa.selenium.By;
import org.openqa.selenium.WebDriver;
import org.openqa.selenium.firefox.FirefoxDriver;

public class javaclass {

    WebDriver driver;

    public void launchBrowser() {
        System.setProperty("webdriver.gecko.driver", "C:\\selenium downloads\\drivers\\geckodriver.exe");
        driver = new FirefoxDriver();
        driver.get("http://localhost/Final_Project/user/user_login.php");
        driver.findElement(By.id("email")).sendKeys("Dasnt");
        driver.findElement(By.id("password")).sendKeys("axe");
        driver.findElement(By.id("submit")).click();
    }

    public static void main(String[] args) {
        javaclass obj = new javaclass();
        obj.launchBrowser();
    }

}
```

```
<terminated> javaclass (2) [Java Application] C:\Program Files\Java\jdk-14.0.2\bin\javaw.exe  (Dec 11, 2021, 11:26:07 PM – 11:26:27 PM)
        at org.openqa.selenium.remote.ElementLocation$ElementFinder$2.findElement(ElementLocation.java:162)
        at org.openqa.selenium.remote.ElementLocation.findElement(ElementLocation.java:60)
        at org.openqa.selenium.remote.RemoteWebDriver.findElement(RemoteWebDriver.java:383)
        at org.openqa.selenium.remote.RemoteWebDriver.findElement(RemoteWebDriver.java:375)
        at javaclass.launchBrowser(javaclass.java:17)
        at javaclass.main(javaclass.java:22)
```



localhost/Final_Project/user/use
localhost/Final_Project/user/user_login.php
Activate Windows
Go to Settings to activate Windows.
11:28 PM
12/11/2021

Welcome to Metro Automation

Login

Enter Email  Enter Correct Email

●●●

Login
Signup
Forget Password
Back

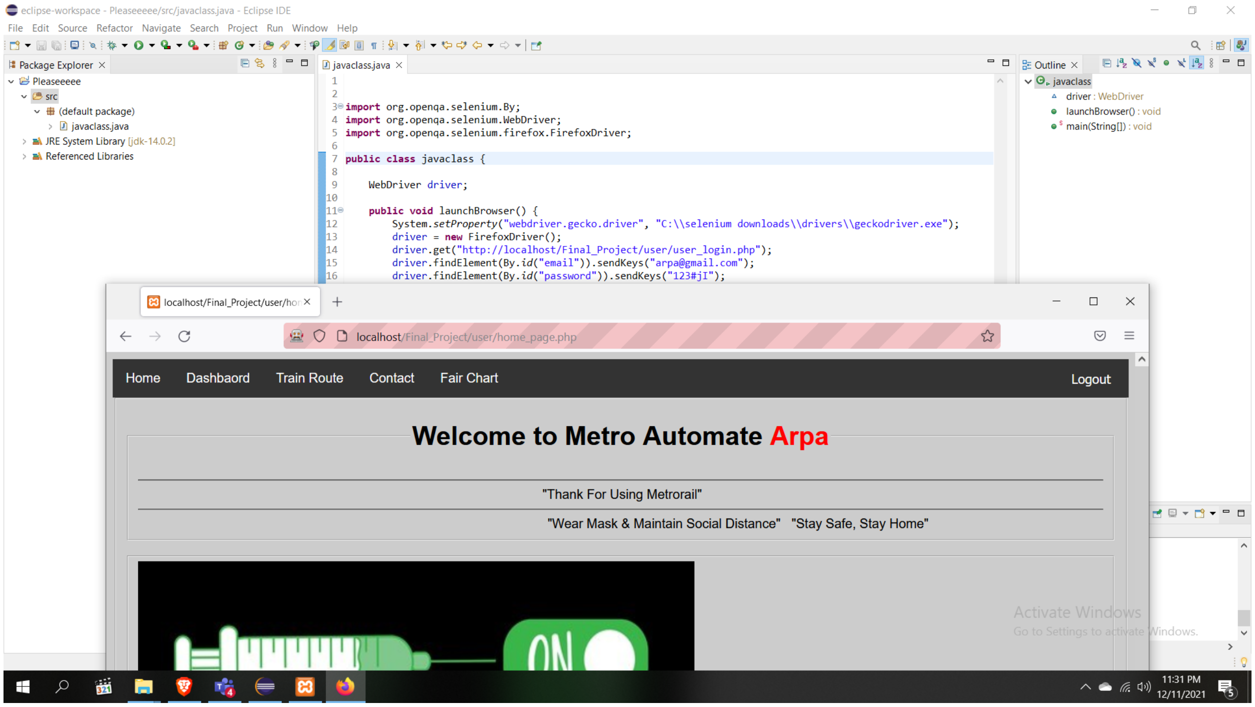
About

Quick Links

This is a Metrorail Ticket Mangement System. You can buy ticket.

About Us

Login failed due to wrong email providing.



eclipse-workspace - Pleaseeeee/src/javaclass.java - Eclipse IDE

```
import org.openqa.selenium.By;
import org.openqa.selenium.WebDriver;
import org.openqa.selenium.firefox.FirefoxDriver;

public class javaclass {

    WebDriver driver;

    public void launchBrowser() {
        System.setProperty("webdriver.gecko.driver", "C:\\selenium downloads\\drivers\\geckodriver.exe");
        driver = new FirefoxDriver();
        driver.get("http://localhost/Final_Project/user/user_login.php");
        driver.findElement(By.id("email")).sendKeys("arpa@gmail.com");
        driver.findElement(By.id("password")).sendKeys("123#jI");
```

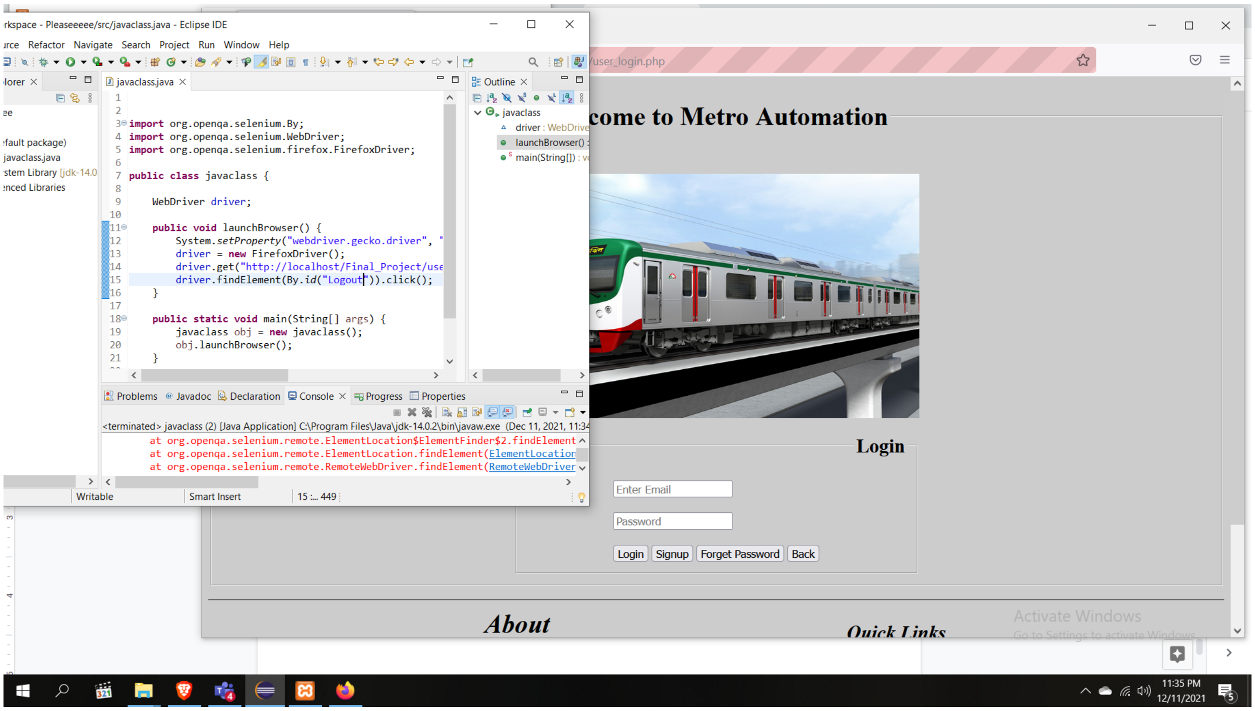
localhost/Final_Project/user/home_page.php

Welcome to Metro Automate Arpa

"Thank For Using Metrorail"

"Wear Mask & Maintain Social Distance" "Stay Safe, Stay Home"

Log in successful



rkspace - Pleaseeeee/src/javaclass.java - Eclipse IDE

```
import org.openqa.selenium.By;
import org.openqa.selenium.WebDriver;
import org.openqa.selenium.firefox.FirefoxDriver;

public class javaclass {

    WebDriver driver;

    public void launchBrowser() {
        System.setProperty("webdriver.gecko.driver", "
        driver = new FirefoxDriver();
        driver.get("http://localhost/Final_Project/use
        driver.findElement(By.id("Logout")).click();
    }

    public static void main(String[] args) {
        javaclass obj = new javaclass();
        obj.launchBrowser();
    }
```

```
<terminated> javaclass (2) [Java Application] C:\Program Files\Java\jdk-14.0.2\bin\javaw.exe  (Dec 11, 2021, 11:34
        at org.openqa.selenium.remote.ElementLocation$ElementFinder$2.findElement
        at org.openqa.selenium.remote.ElementLocation.findElement(ElementLocation
        at org.openqa.selenium.remote.RemoteWebDriver.findElement(RemoteWebDriver
```

/user_login.php

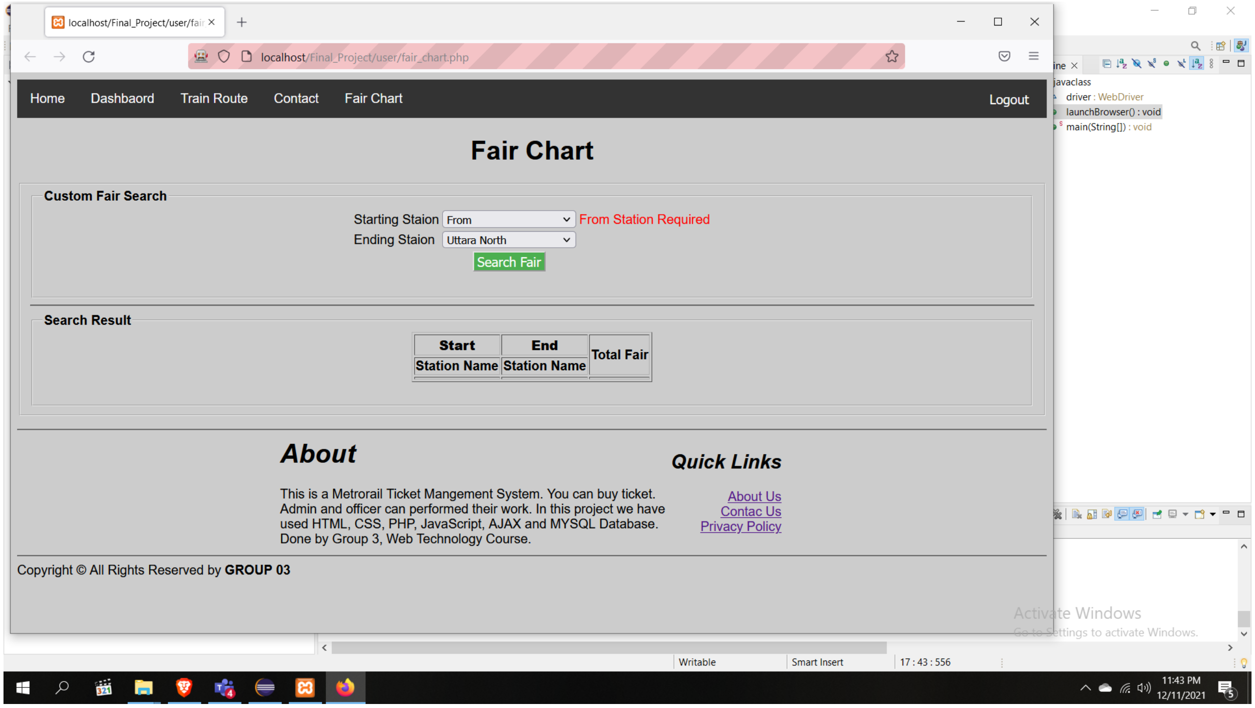
come to Metro Automation

Login

Enter Email

Password

Successfully logged out



Fair Chart

Custom Fair Search

Starting Staion From From Station Required

Ending Staion Uttara North

Search Result

| Start | End | Total Fair |
|---|---|---|
| Station Name | Station Name | |

About

This is a Metrorail Ticket Mangement System. You can buy ticket. Admin and officer can performed their work. In this project we have used HTML, CSS, PHP, JavaScript, AJAX and MYSQL Database. Done by Group 3, Web Technology Course.

Quick Links

About Us
Contac Us
Privacy Policy

Copyright © All Rights Reserved by **GROUP 03**

Search failed due to wrong input.

# Answer to the ques no. 4

After all these process done by SELENIUM, now it is time to go for a simple software testing where we can show the proof of work and also verify our entire project with a test result as SUCCESS or FAILED just like follows:

Project Name: Metrorail Automation

Test Case No: 01

Test Priority: very High

Test Case Scenario: To test the automated web browser automation of a web-project based on railway service

Test Title: To verify the proper automation of the project “Metrorail Automation” using selenium

Description: It is to check, if the project runs properly with the help of selenium.

Pre-Condition: Eclipse IDE and all Selenium configuration must be set.

Dependencies: selenium-webdriver, jdk 14.0.2

| Test case | Test data | Expected result | Actual result | Status |
|---|---|---|---|---|
| Open Project Directory | | | | |
| Type necessary fundamentals in Eclipse to start with | | | | SUCCESS |
| Input project directory in the java code(eclipse) | | Reach the expected page in the browser | Reach the expected page in the browser | |
| Provide Values for login(wrong and right both) | Email and password | If wrong, it won't log in with caution.<br>In case of right credentials it will log in. | As expected | |
| Provide values from inspecting to check buttons and feature | Inspection values for id | Feature works. (We tried with log out) | Logged out | |