

## STQA Mini Project No. 2

### Title

Create a small web-based application by selecting relevant system environment/platform and programming languages. Narrate concise Test Plan consisting features to be tested and bug taxonomy. Narrate scripts in order to perform regression tests. Identify the bugs using Selenium WebDriver and IDE and generate test reports encompassing exploratory testing.

### Problem Definition:

Perform Web testing and identify the bugs using Selenium WebDriver and IDE and generate test reports encompassing exploratory testing.

### Prerequisite:

Knowledge of Core Java

### Software Requirements:

Eclipse photon R latest Version, JAVA 1.8, selenium-server-standalone-3.13.0 Chromedriver.exe

### Hardware Requirement:

PIV, 2GB RAM, 500 GB HDD, Lenovo A13-4089 Model.

### Learning Objectives:

We are going to learn how Identify the bugs using Selenium WebDriver and IDE and generate test reports encompassing exploratory testing.

### Outcomes:

You are able to Web Testing using Automation Tool like Selenium Web driver and IDE

### Theory Concepts:

#### What is 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...

Note: **Selenium IDE supports Mozilla Firefox only.**

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

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

### **History of the Selenium Project**

Selenium first came to life in 2004.

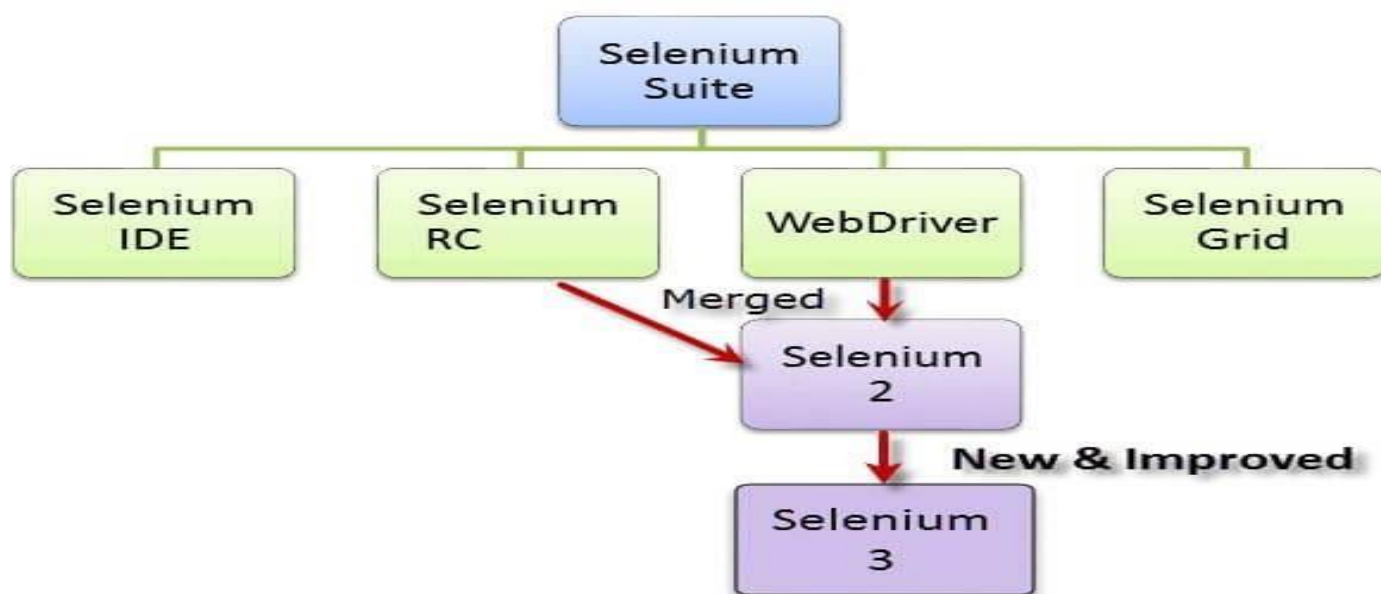
- In 2006, Selenium WebDriver was launched at Google.
- In 2008, the whole Selenium team decided to merge Selenium WebDriver with Selenium RC in order to form more powerful tool called Selenium 2.0
  - ✓ **Selenium 1**  
(Selenium IDE + Selenium RC + Selenium Grid)
  - ✓ **Selenium 2**  
(Selenium IDE + 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.

- **Selenium Integrated Development Environment (IDE)**
- **Selenium Remote Control (RC)**
- **WebDriver**
- **Selenium Grid**



### Brief Introduction Selenium IDE

It is a Firefox browser plug in, used to create and execute Test cases.

#### 1. Selenium IDE Features:

- Create Test Cases, Test suites (We can Record test cases or type Test steps using element locators and Selenese commands)
- Edit Test Cases
- Execute Test cases, Test suites
- Debug Test Cases.
- Enhance Test Cases
- Export Test cases to other formats (java, ruby etc...)

Note: **selenium IDE Test case default format is .html**

## 2. Drawbacks of Selenium IDE

- It supports Mozilla Firefox browser only.
- It doesn't support Programming logic/features to enhance Test cases.
- It doesn't support Data Driven Testing.
- It is not suitable for complex test case design.
- No centralized maintenance of Objects/Elements

**3. Selenium RC (\* Out dated)** -Currently, Selenium RC is still being developed but only in maintenance mode.

## 4. Selenium WebDriver

- ✓ It is a Programming interface to create and execute Test cases.

Selenium IDE has IDE but doesn't have Programming interface

- ✓ Selenium WebDriver has Programming interface but doesn't have IDE
  - ✓ It communicates Directly to the browser.
  - ✓ No need of Separate Server such as RC Server
  - ✓ UFT/QTP has both IDE as well as Programming interface
  - ✓ Faster Execution than IDE & RC
- **Selenium WebDriver supports various programming environments to write programs.**
    - ✓ Java,
    - ✓ C#
    - ✓ Perl
    - ✓ Python
    - ✓ Ruby
    - ✓ PHP
  - Using Element/Object locators/properties and Webdriver Methods we can create and execute Test cases.
  - Selenium Webdriver supports various browsers to create and execute test case/test script/test

Note: **Browser driver varies from one browser to another.**

- **Selenium WebDriver supports various operating environments**

- ✓ MS Windows
- ✓ Linux Macintosh etc...

**Drawback of Selenium WebDriver**

- It doesn't generate detailed Test Reports.
- No centralized maintenance of Object/elements
- It require Programming Knowledge
- cannot support the readily new browser
- Installation is More Complicated than Selenium IDE
- No built-in mechanism for logging runtime message

**5. Selenium Grid**

- Selenium Grid is used to execute tests across multiple browsers, operating environments and machines in parallel.
- Selenium Grid 2 supports Selenium RC Tests as well as Selenium WebDriver Tests.
  - i) Selenium WebDriver to create Test cases using element locators and Webdriver methods.
  - ii) Java Programming to enhance test cases.
  - iii) TestNG Framework to group test cases, execute test batches and generate detailed test reports.

**Features:**

- Enables **simultaneous running of tests in multiple browsers and environments.**
- **Saves time** enormously.
- Utilizes the **hub-and-nodes** concept. The hub acts as a central source of Selenium commands to each node connected to it.

**Note on Browser and Environment Support**

- Because of their architectural differences, Selenium IDE, Selenium RC, and WebDriver support different sets of browsers and operating environments.

	<b>Selenium IDE</b>	<b>WebDriver</b>
<b>Browser Support</b>	Mozilla Firefox	Internet Explorer versions 6 to 11, both 32 and 64-bit  Microsoft Edge version 12.10240 & above ( partial support some

	<b>Selenium IDE</b>	<b>WebDriver</b>
		functionalities under development) Firefox 3.0 and above Google Chrome 12.0. and above Opera 11.5 and above Android - 2.3 and above for phones and tablets (devices & emulators)  iOS 3+ for phones (devices & emulators) and 3.2+ for tablets (devices & emulators)  HtmlUnit 2.9 and above
<b>Operating System</b>	Windows,Mac OS X, Linux	All operating systems where the browsers above can run.

- **Note:** Selenium WebDriver is termed as the successor of Selenium RC which has been deprecated & officially announced by SeleniumHQ.

**How to Choose the Right Selenium Tool for Your Need**

<b>Tool</b>	<b>Why Choose?</b>
<b>Selenium IDE</b>	<ul style="list-style-type: none"> <li>• To learn about concepts on automated testing and Selenium, including:</li> <li>• Selenese commands such as type, open, clickAndWait, assert, verify, etc.</li> <li>• Locators such as id, name, xpath, css selector, etc.</li> <li>• Executing customized JavaScript code using runScript</li> <li>• Exporting test cases in various formats.</li> <li>• To create tests with little or no prior knowledge in programming.</li> <li>• To create simple test cases and test suites that you can export later to RC or WebDriver.</li> <li>• To test a web application against Firefox only.</li> </ul>
<b>Selenium RC</b>	<ul style="list-style-type: none"> <li>• To design a test using a more expressive language than Selenese</li> <li>• To run your test against different browsers (except HtmlUnit) on different operating systems.</li> <li>• To deploy your tests across multiple environments using Selenium Grid.</li> </ul>

Tool	Why Choose?
	<ul style="list-style-type: none"> <li>• To test your application against a new browser that supports JavaScript.</li> <li>• To test web applications with complex AJAX-based scenarios.</li> </ul>
<b>WebDriver</b>	<ul style="list-style-type: none"> <li>• To use a certain programming language in designing your test case.</li> <li>• To test applications that are rich in AJAX-based functionalities.</li> <li>• To execute tests on the HtmlUnit browser.</li> <li>• To create customized test results.</li> </ul>
<b>Selenium Grid</b>	<ul style="list-style-type: none"> <li>• To run your Selenium RC scripts in multiple browsers and operating systems simultaneously.</li> <li>• To run a huge test suite, that needs to complete in the soonest time possible.</li> </ul>

### Advantages of Selenium

- i) It is an Open source Software.
- ii) It supports various Operating environments (Windows, Linux, Mac etc...)
- iii) It supports various browsers (IE, Mozilla Firefox, Chrome, safari, Opera etc...)
- iv) It supports various programming environments (Java, Perl, Python, Ruby and PHP)
- v) It supports parallel Test execution.
- vi) It uses less Hardware resources.

### Disadvantages of Selenium

- i) It supports Web based Applications only.
- ii) No reliable support from anybody.
- iii) No centralized maintenance of Elements/objects
- iv) Difficult to setup environment.
- v) Difficult to use.
- vi) Limited support for Image based testing.
- vii) New features may not work properly.
- viii) No other tool integration for test management & No built in Reporting facility.

## Selenium Versus UFT

Selenium	UFT / QTP
1) Open Source	Vendor tool, License is required.
2) Supports various OS Environments.	MS Windows only.
3) Supports various Programming Environments	VBScript only.
4) No Object Repositories	Local and Shared object Repositories.
5) No built-in Reporting feature.	Built-in reporting feature.
6) Selenium WebDriver has no IDE and Selenium IDE has no Programming Interface.	UFT has both IDE and Programming Interface.
7) Uses less Hardware resources.	Uses more Hardware resources
8) Difficult to setup environment and use.	Easy to setup and use.
9) Limited support for Image Testing	Rich support for Image Testing
10) No Reliable support	Support from HP
11) No other tool integration for Test management.	UFT can be integrated with ALM/QC for Test Management.
12) New features may not work properly.	New features will properly.
13) No Add ins for supporting Application Environments.	Add ins are required for supporting Application environments.
14) Supports Web Applications only	Supports Desktop and Web Applications.
15) No Authorized Certification	Authorized Certification program.

## What is TestNG?

TestNG is a powerful testing framework, an enhanced version of JUnit which was in use for a long time before TestNG came into existence. NG stands for 'Next Generation'.

TestNG framework provides the following features –

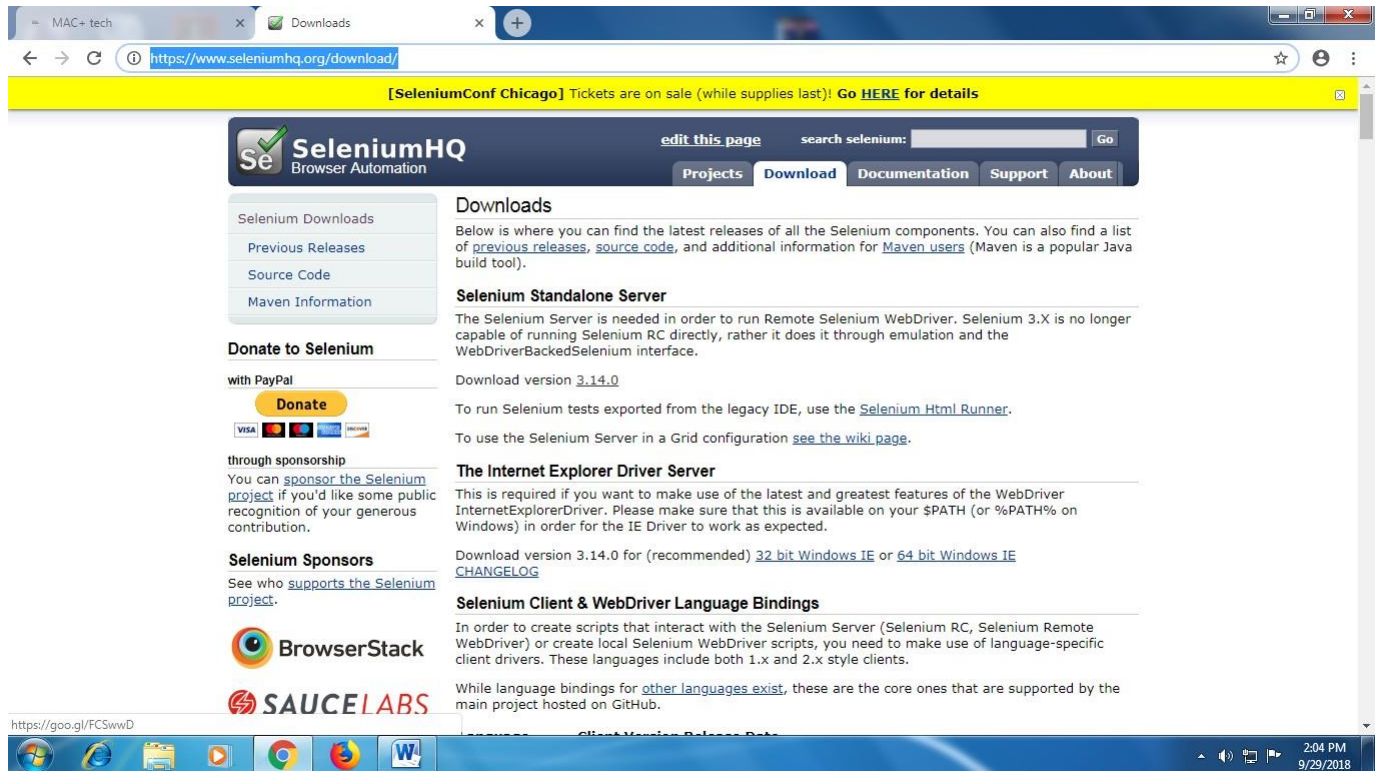
- Annotations help us organize the tests easily.
- Flexible test configuration.
- Test cases can be grouped more easily.
- Parallelization of tests can be achieved using TestNG.
- Support for data-driven testing.
- Inbuilt reporting.



## 2.8.9 Step by Step Tutorial

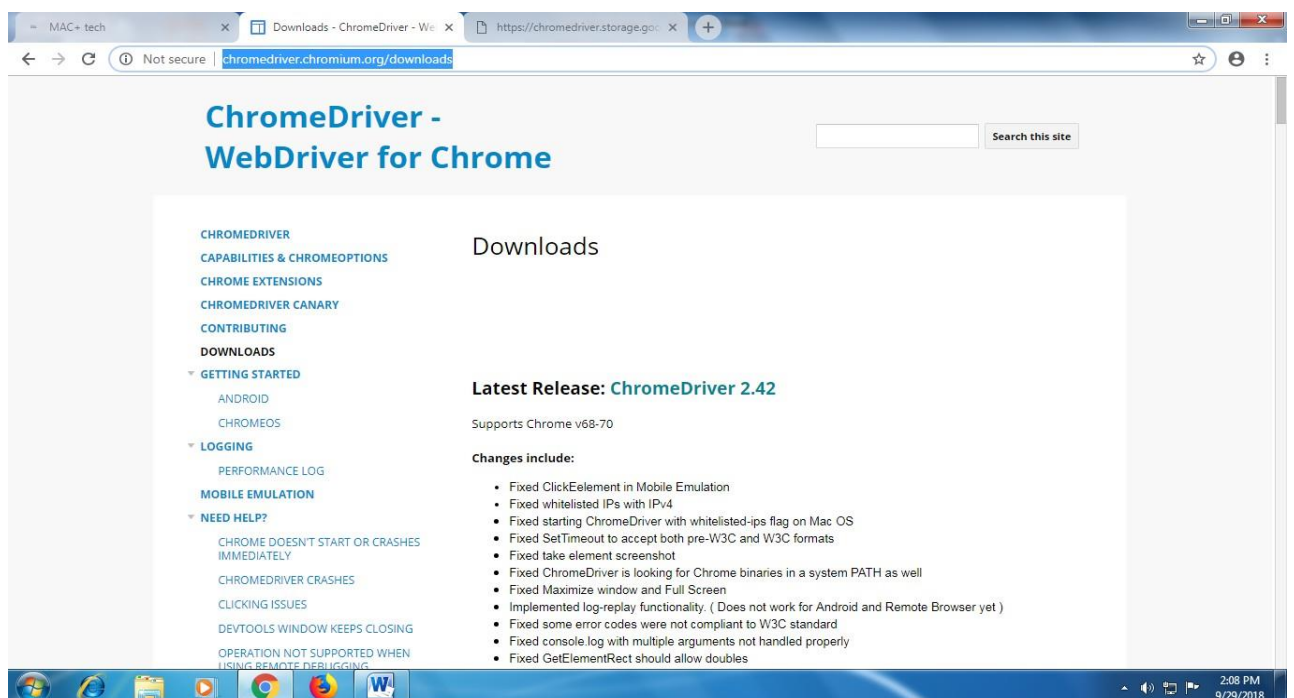
1. First of Download Latest Eclipse java photon-R version.
2. Download latest **selenium-server-standalone-3.13.0 jar** File from following link

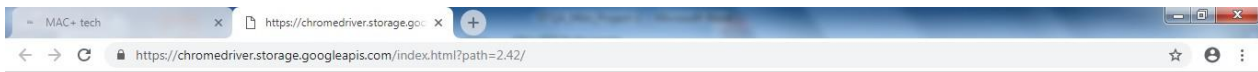
<https://www.seleniumhq.org/download/> here on site 3.14.0 version is latest



3. Download and Extract **Chromedriver.exe for windows** on any drive of computer.

<http://chromedriver.chromium.org/downloads> here 2.42 is latest version



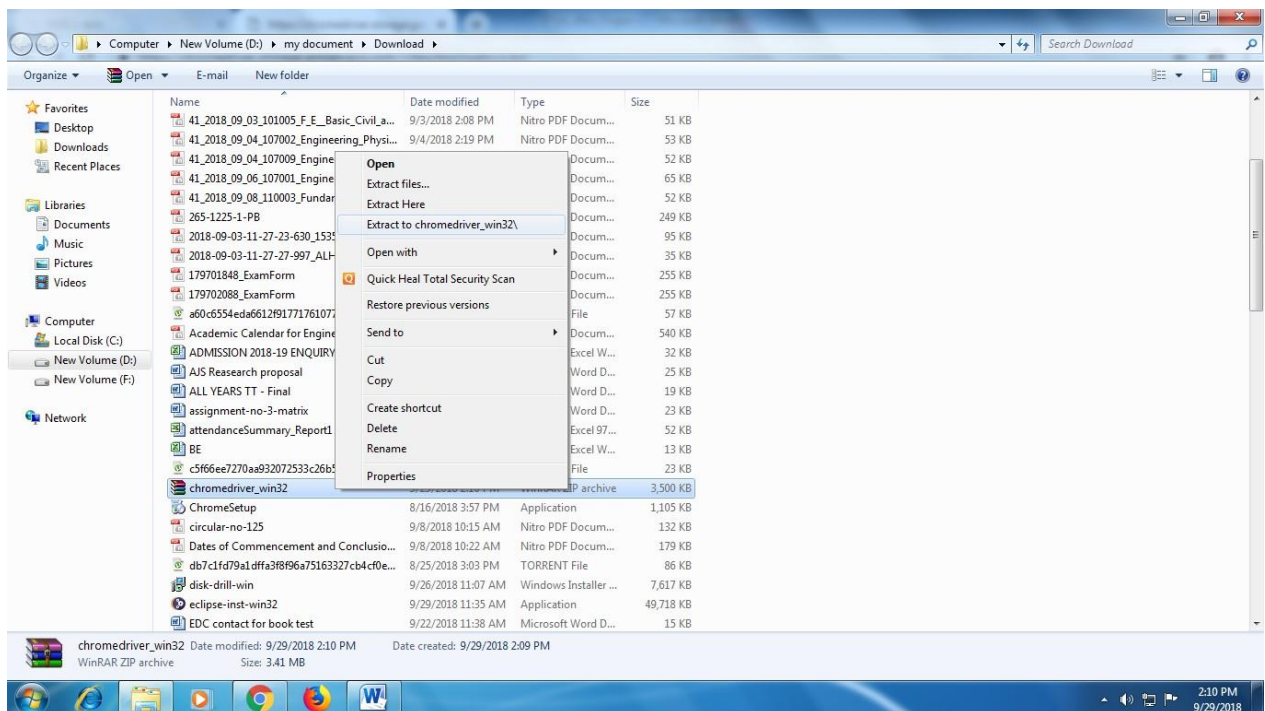


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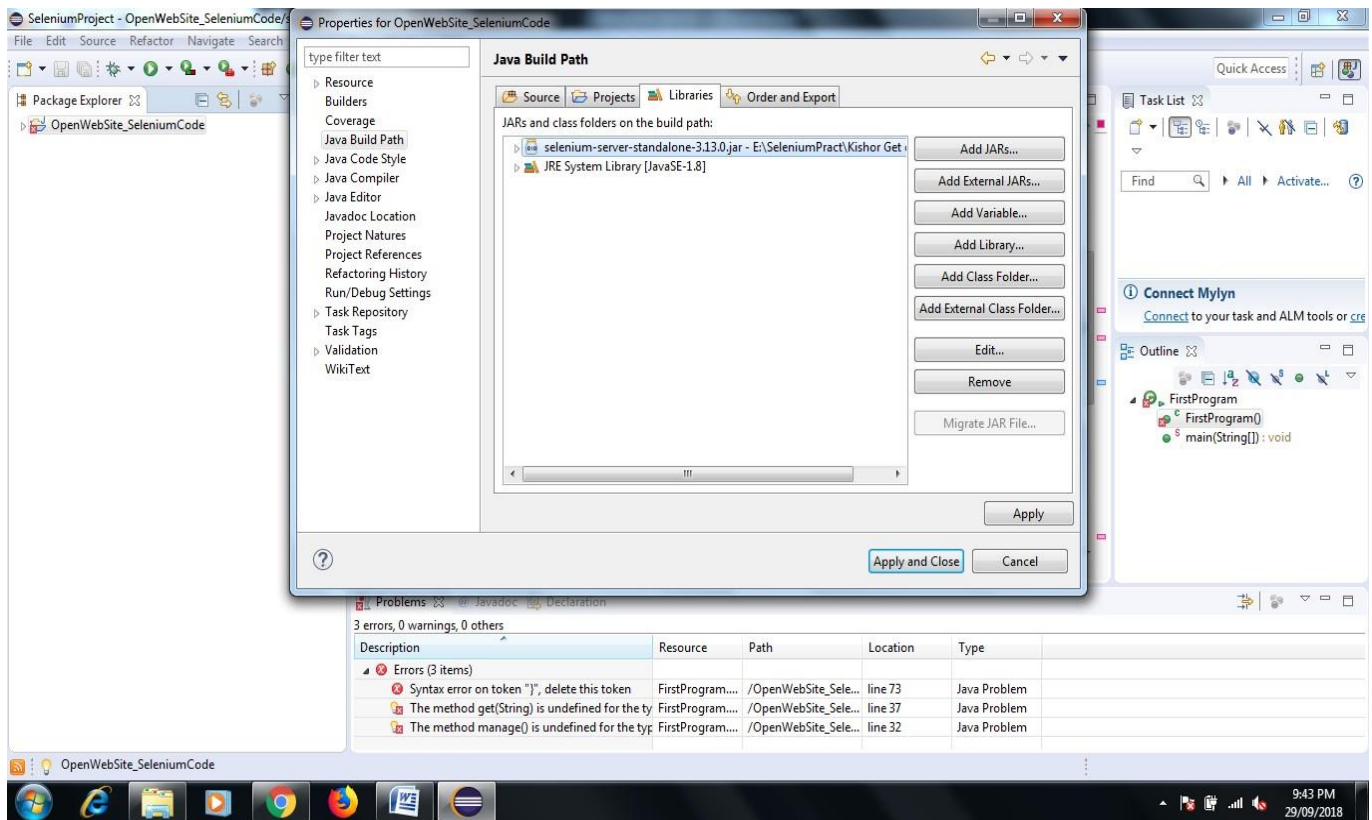
Name	Last modified	Size	ETag
Parent Directory		-	
chromedriver_linux64.zip	2018-09-13 19:30:37	3.85MB	acfcc29fb03df9e913ef4c360a121ad1
chromedriver_mac64.zip	2018-09-13 18:14:11	5.75MB	3fc0e4a97cbf2c8c2a9b824d95e25351
chromedriver_win32.zip	2018-09-13 21:11:33	3.42MB	28d91b31311146250e7ef1afbc6d6d026
notes.txt	2018-09-13 21:23:09	0.02MB	18bd6fc9f9d8dd668fa444b77d06bdd



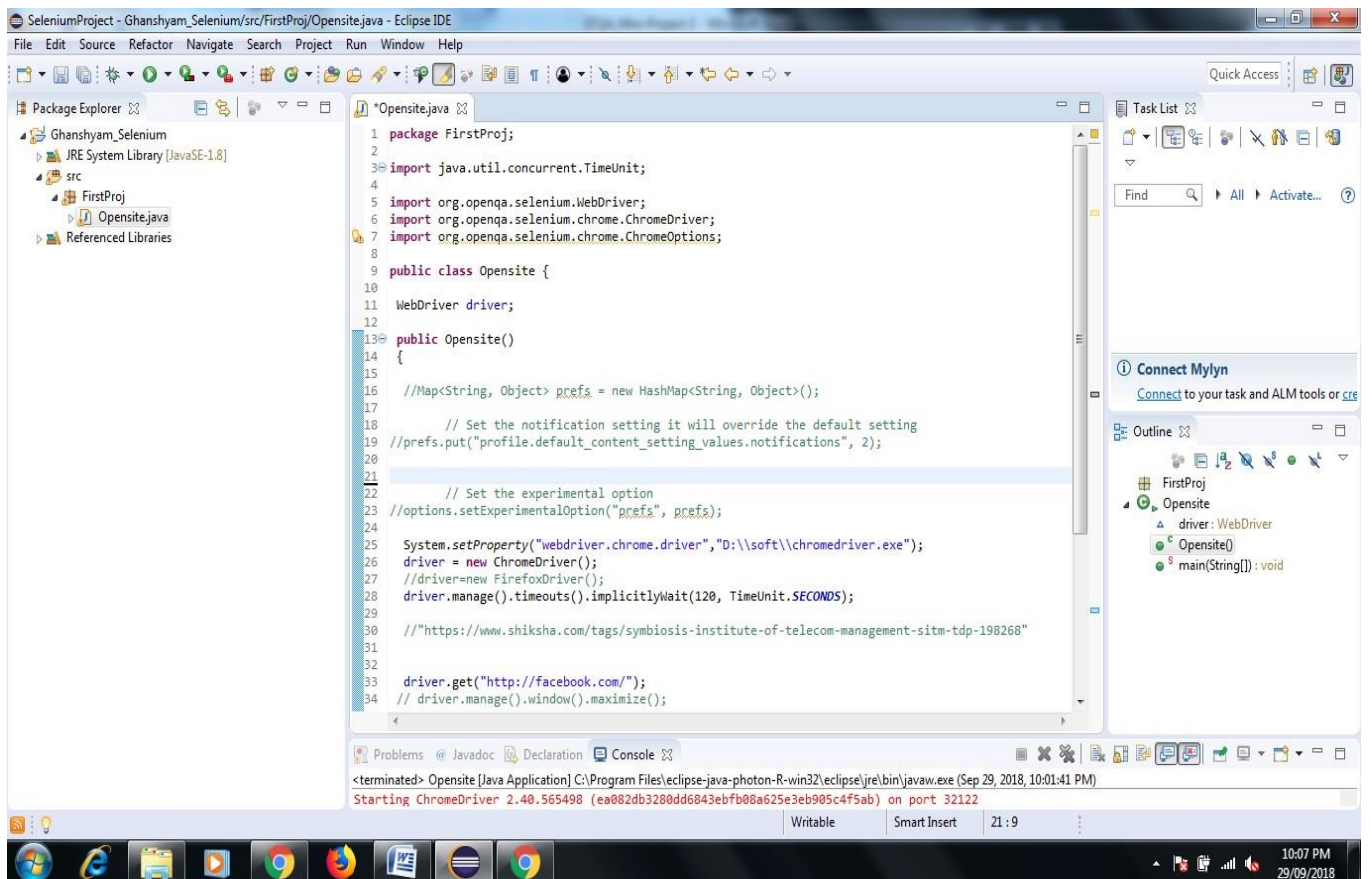
- After Download Extract same on any Drive here I m extract on D Drive and my path of that exe file is D:\my document\Download\chromedriver\_win32



- Now Open Eclipse IDE-----> Create Java Project-> Right Click Project Name->Properties-> Java Build Path->Libraries->Add External JAR-> add selenium-server-standalone-3.13.0 jar ->Apply and Close.

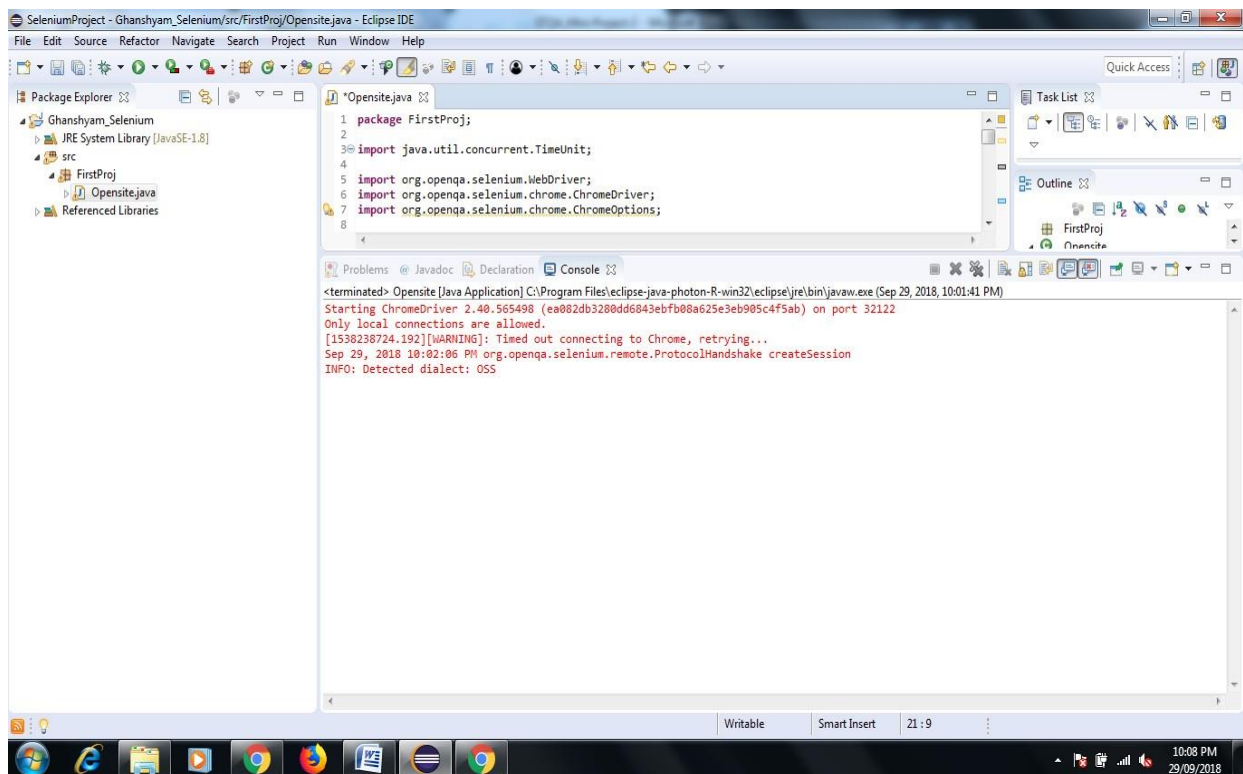


6. Now Want **Open the chrome browser with facebook.com page via Selenium Web driver Java Coding** so here we need to write Java Code in Class file which we already created
7. Here in My Program I Create **Ghanshyam\_Selenium Java Project Folder name and Opensite.java is my class file** so write java code in this class file





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

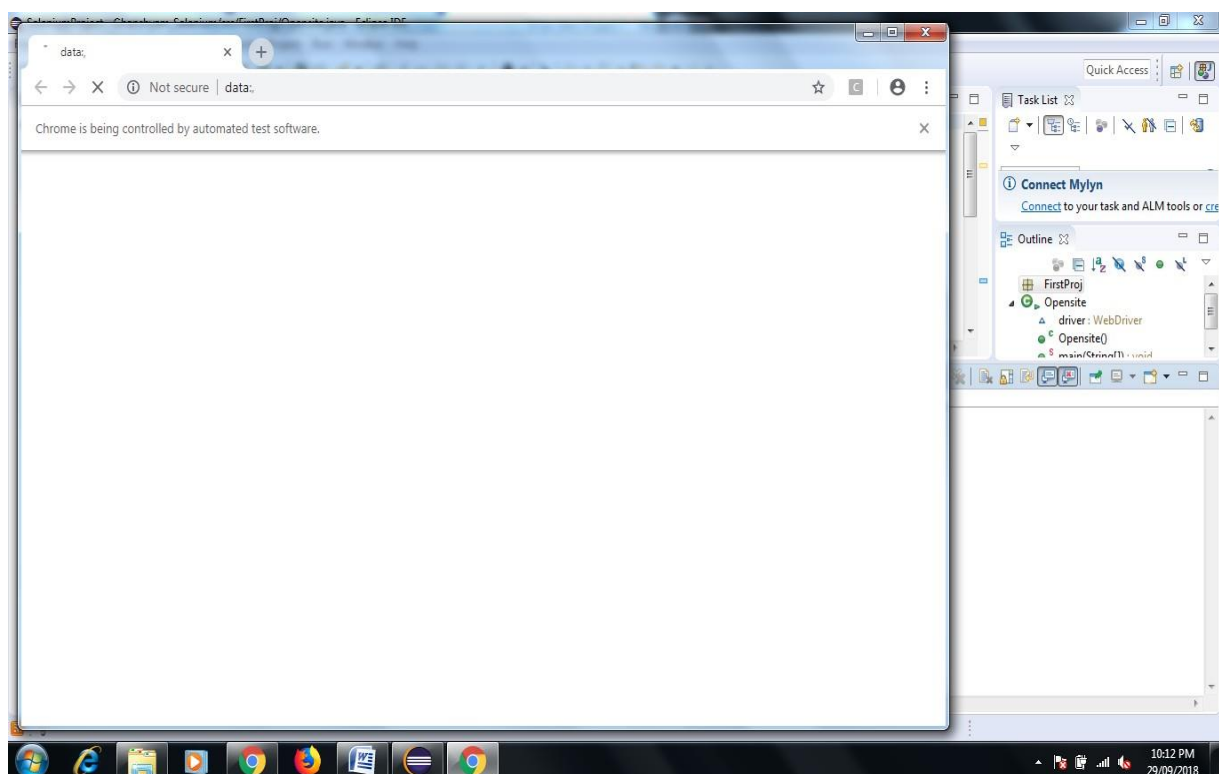


9. Now Your browser Open Automatically it shown data;

10. one more message display **chrome is being controlled by Automated Test Software**

**It mean we open chrome browser and facebook.com page by selenium web driver java code**

**Successfully.**



In this way Our First Module Run Successfully.

## Module-2 In This Project I want to collect all Rating Feedback related our college available on website Justdial.com

1. Create One Java Project Folder Give Name → Review Demo → Now Create One Class File give name Practo.com
2. Right Click Project Name → Properties → Java Build Path → Libraries → Add External JAR → add selenium-server-standalone-3.13.0 jar → Apply and Close.
3. Similarly Copy the Chromedriver.exe file on my D Drive `D:/soft/chromedriver.exe` in this way.
4. Now Start right writing code for Practo.java to Collect all review of any Hospital.

Here I want search all feedback of **SNJB-s-Late-Sau-Kantabai-Bhavarlalji-Jain-College-Of-Engineering-Neminagar-Chandwad**

Link of Feedback of All Customer-

[https://www.justdial.com/Nashik/SNJB-s-Late-Sau-Kantabai-Bhavarlalji-Jain-College-Of-Engineering-Neminagar-Chandwad/0253PX253-X253-151019113056-B2P9\\_BZDET/reviews/page-6](https://www.justdial.com/Nashik/SNJB-s-Late-Sau-Kantabai-Bhavarlalji-Jain-College-Of-Engineering-Neminagar-Chandwad/0253PX253-X253-151019113056-B2P9_BZDET/reviews/page-6)

5. Now to save Feedback of all pages here I create one text file give name

`C:\Users\admin\workspace\SeleniumProject\ReviewProj\Snbj.txt`

Now First of All Execute Code here my file name Mouthshut.java

Mouthshut.com is website like Justdialcom

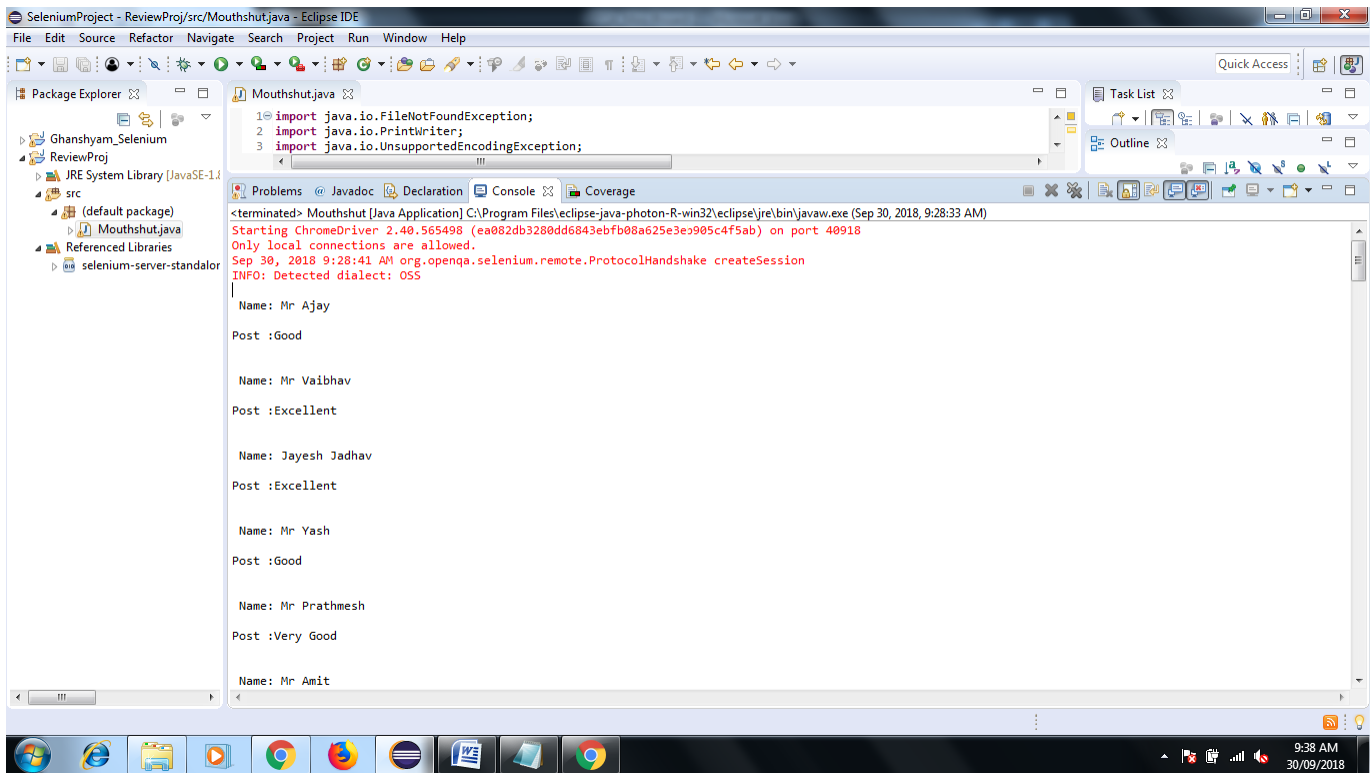
```

1 import java.io.FileNotFoundException;
2 import java.io.PrintWriter;
3 import java.io.UnsupportedEncodingException;
4 import java.util.HashMap;
5 import java.util.List;
6 import java.util.Map;
7 import java.util.concurrent.TimeUnit;
8
9 import org.openqa.selenium.By;
10 import org.openqa.selenium.JavascriptExecutor;
11 import org.openqa.selenium.WebDriver;
12 import org.openqa.selenium.WebElement;
13 import org.openqa.selenium.chrome.ChromeDriver;
14 import org.openqa.selenium.chrome.ChromeOptions;
15 import org.openqa.selenium.firefox.FirefoxDriver;
16
17 public class Mouthshut {
18
19     WebDriver driver;
20
21     public Mouthshut()
22     {
23
24         Map<String, Object> prefs = new HashMap<String, Object>();
25
26         // Set the notification setting it will override the default setting
27         prefs.put("profile.default_content_setting_values.notifications", 2);
28
29         // Create object of ChromeOption class
30         ChromeOptions options = new ChromeOptions();
31
32         // Set the experimental option
33         options.setExperimentalOption("prefs", prefs);
34
35     }
36
37     public static void main(String[] args) {
38
39         Mouthshut mouthshut = new Mouthshut();
40         mouthshut.driver = new ChromeDriver(mouthshut.options);
41         mouthshut.driver.manage().window().maximize();
42         mouthshut.driver.get("https://www.justdial.com/Nashik/SNJB-s-Late-Sau-Kantabai-Bhavarlalji-Jain-College-Of-Engineering-Neminagar-Chandwad/0253PX253-X253-151019113056-B2P9_BZDET/reviews/page-6");
43         mouthshut.fetchdata("https://www.justdial.com/Nashik/SNJB-s-Late-Sau-Kantabai-Bhavarlalji-Jain-College-Of-Engineering-Neminagar-Chandwad/0253PX253-X253-151019113056-B2P9_BZDET/reviews/page-6");
44     }
45
46     void fetchdata(String url) {
47
48     }
49
50     void f_just(String url) {
51
52     }
53
54     void best_h(String url) {
55
56     }
57
58     void main(String[] args) {
59
60     }
61 }

```

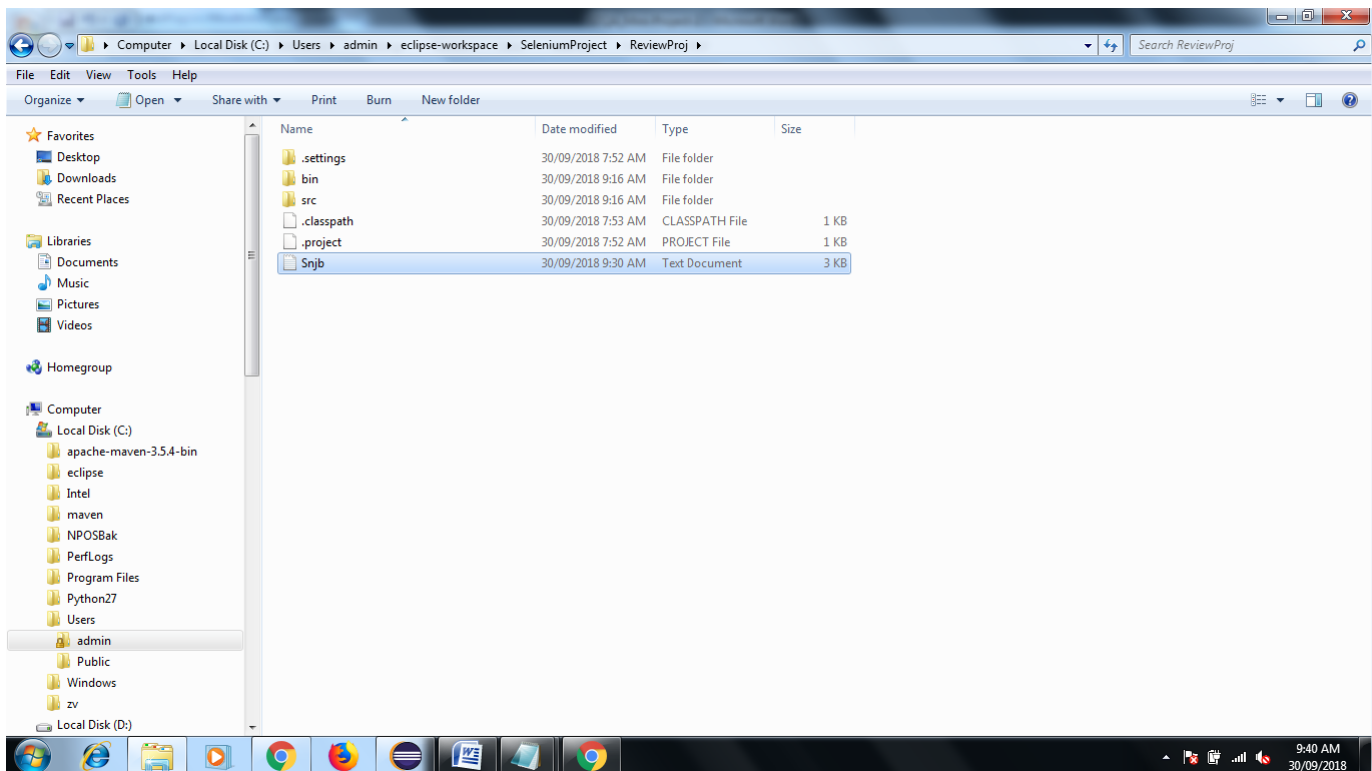
terminated> Mouthshut [Java Application] C:\Program Files\eclipse-java-photons-R-win32\ eclipse\jre\bin\javaw.exe (Sep 30, 2018, 9:28:33 AM)

After Execution Code Mouthshut.java Chrome Browser Opened Automatically with Specified website you can also see the output of rating in console as well as file you created.



Now Lets Check the Feedback of All Customer go to your Eclipse Workspace Path my path is

**C:\Users\admin\eclipse-workspace\SeleniumProject\ReviewProj\Snbj.txt**



After Open Txt File See the Output

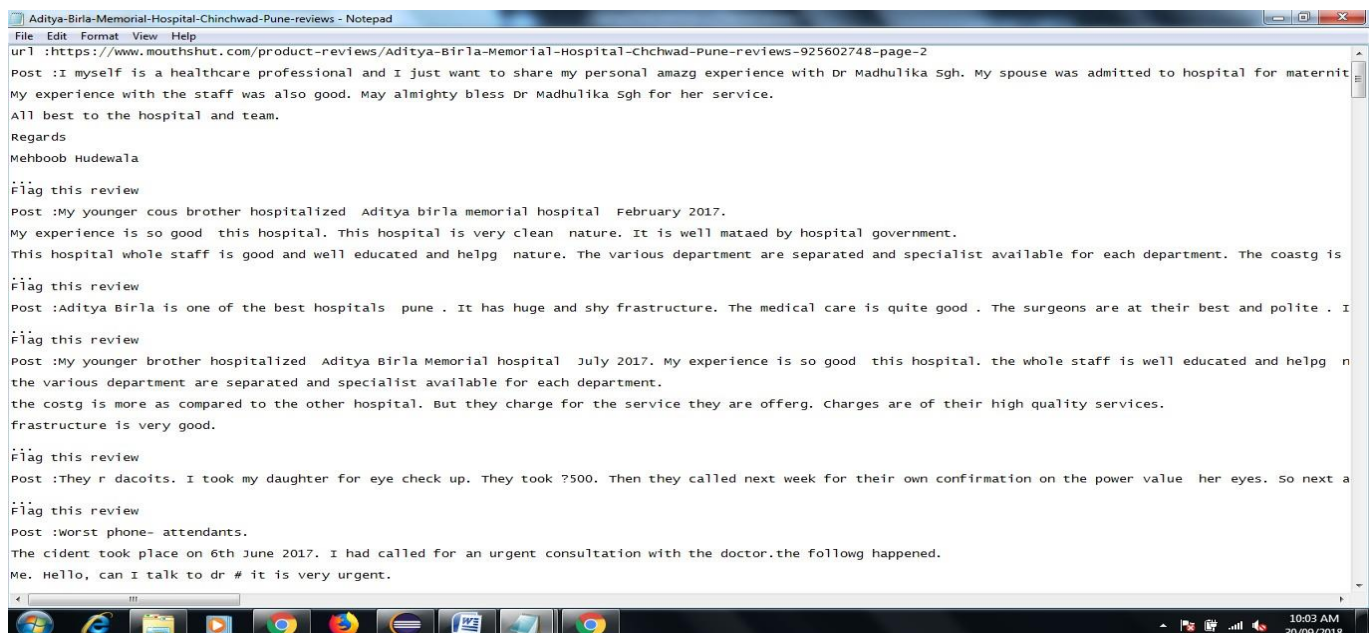


In This you can Collect all different kind of colleges, hospital rating and review from various website like mouthshout.com,Justdial.com via Selenium Web driver Tool

**Module-3 Now I want Collect Review of Aditya-Birla-Memorial-Hospital-Chinchwad-Pune**

Link- <https://www.mouthshut.com/product-reviews/Aditya-Birla-Memorial-Hospital-Chchwad-Pune-reviews-925602748-page-2>

After Execution of Code-



**Selenium IDE:**

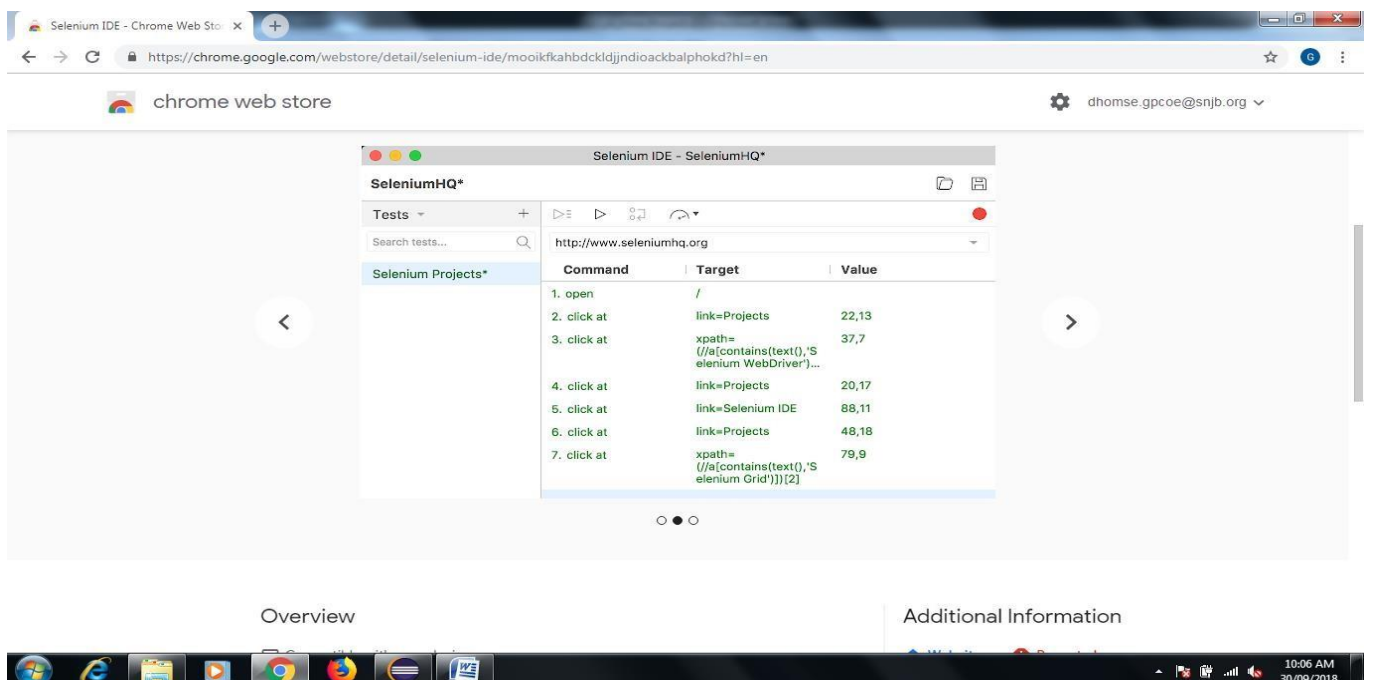
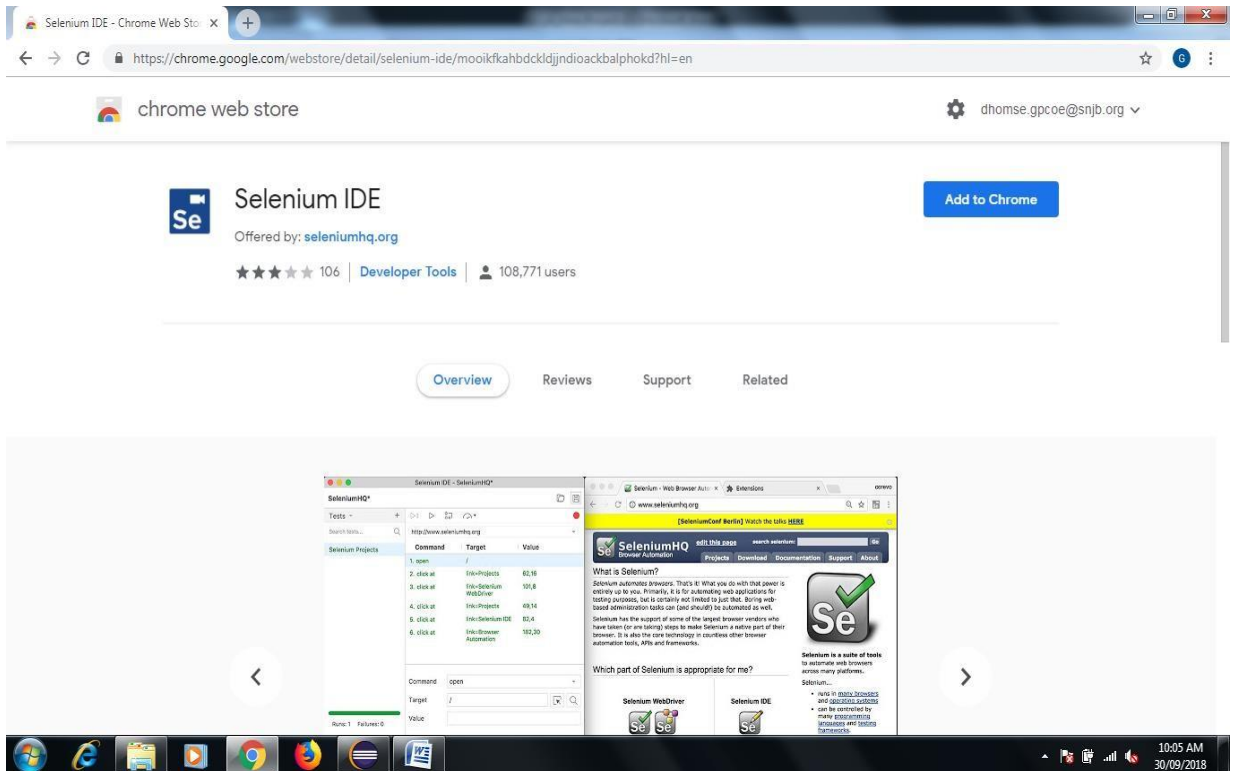
1. Download Selenium IDE Chrome Extension from following Link

<https://chrome.google.com/webstore/detail/selenium-ide/mooikfkahbdckldjndioackbalphokd?hl=en>

2. Click on Add to Chrome

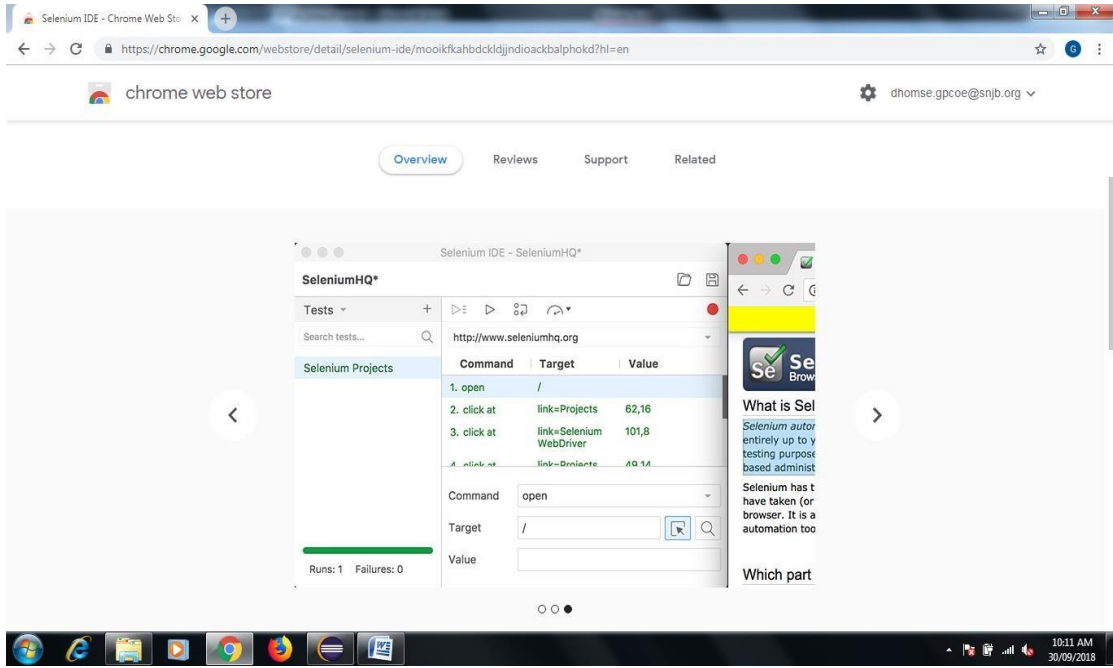
3. Check the icon on of IDE Square in right side after browser after successfully installation to chrome

4. Now Click on record button do some operation on website...see the report in console of IDE command target and value....in this way you also find out xpath etc information.





You can also check the Automated Test Case Pass or Fails see the following figure



### Conclusion

In this way you learn how to use Selenium Open Source Tool for perform Automation Testing on web based application.