Selenium

What is Automation?

Doing any task using a tool or system without manual intervention is called Automation.You can also call it as replication of human effort.

Advantages of Automation.

1. It is faster.
2. Saves Time
3. Reduces effort.
4. Increases the Quality.

Disadvantages of Automation.

1. Initial investment is high.
2. Required Skilled Man power.

What is Selenium?

Selenium is free(open Source) testing suite containing tools each with different approach for test automation of web application.

History of Selenium.

Selenium core –JavaScript on Notepad.

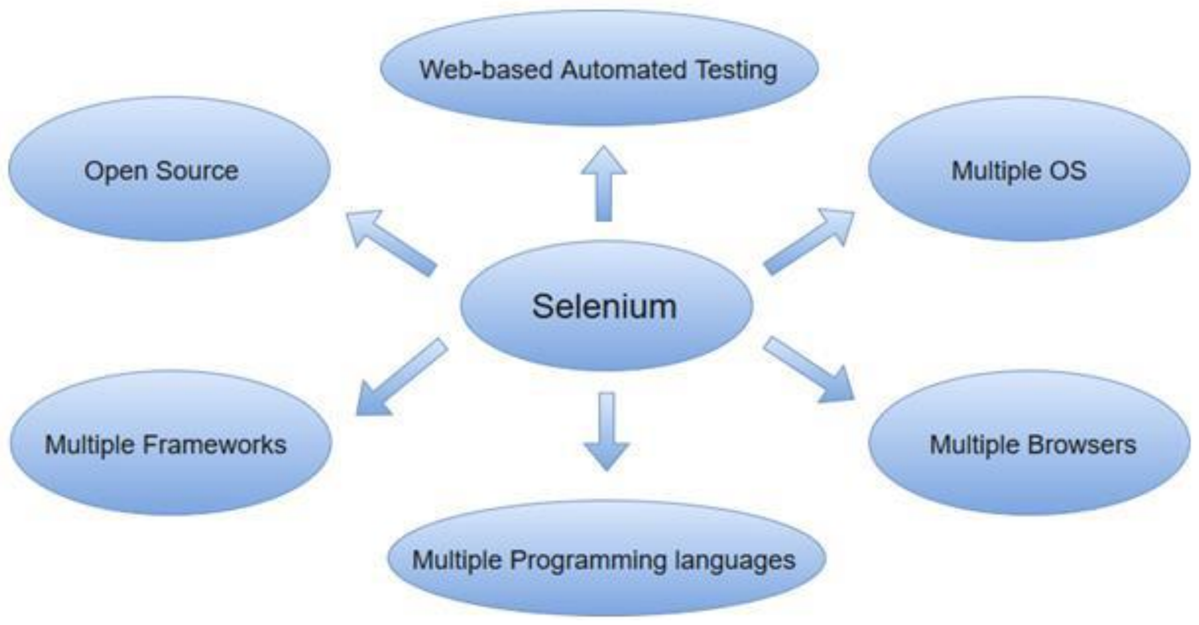
Selenium IDE-No Need to have programming language with record and play feature and Firefox add on.

Selenium Remote control-it is basically for compatibility testing.

Selendroid-for android application.

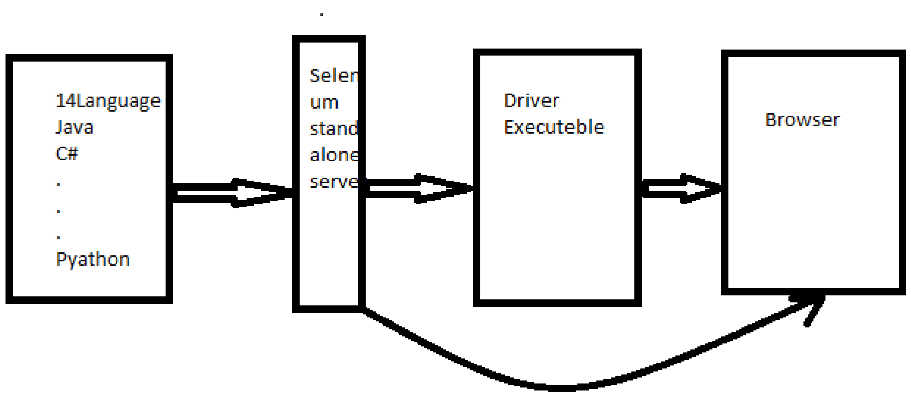
Selenium WebDriver-For Web Server.

Appium-For Both Window and ios.



<u>Selenium Architecture</u>

Selenium Stand alone server combined with 14 language(java,c#) which is known as language binding or client binding . Selenium Stand alone server perform real actions on Browser by Driver executable using Json(javaScript object notation) via protocol



Json via protocol

Disadvantages of Selenium

- It does not support window application.
- We cannot automate captcha and OTP and animation.
- openSource

Open source mean that we can download it for free and we can see source code and modification in that source code.

Locators

We can locate the web or application element like Text Field and Button.

Types of Locators.

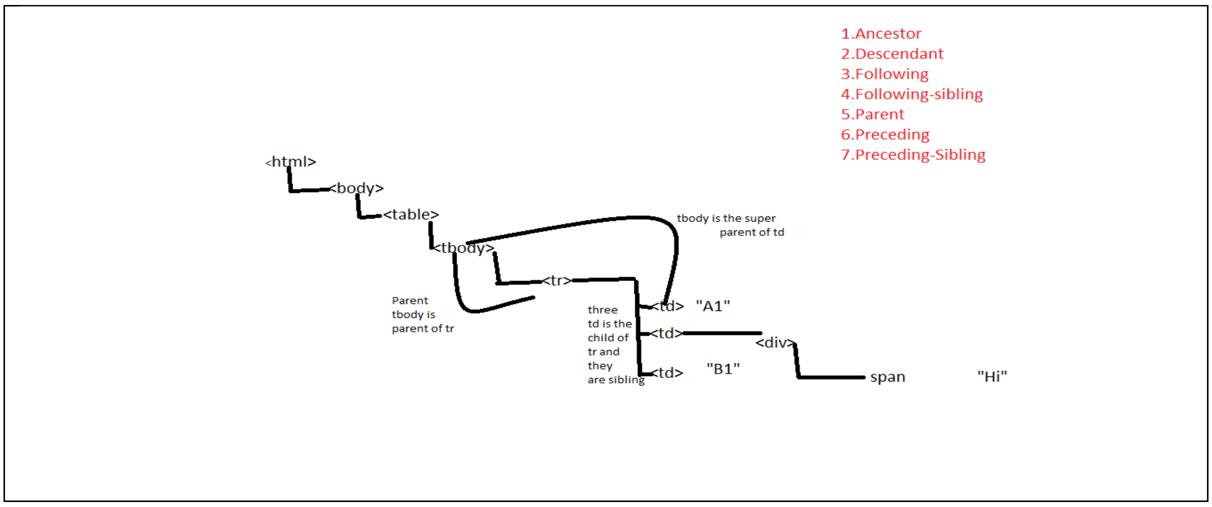
1. ID----1st
2. Name—2nd
3. ClassName
4. TagName
5. LinkText—3rd
6. PartialLinkText
7. Css Selector
8. X-path----4th

All locators are present in BY Class.

X-PATH

1. Reletive. (//)

2. Absolute (/)



Syntax:

TagName [@AtributeName='AtributeValue']

Axis Name	Description
1. Ancestor	Select all the ancestor(parent,grandParent)of the element.
2. Descendant	Select all the descendant(child,grandChild)of the element.
3. Following	Select all the element that follow choosing tag of current element.
4. Following-sibling	Select all the sibling after the current-element.
5. Parent	Select the parent of the current element.
6. Preceding	Select all the element that are before current element.
7. Preceding-Sibling	Select all sibling that are before current element.

METHODS OF WEBDRIVERS.

1. close()

2. get()

3. getTitle()

4. getpagesource()

5. getcurrenturl()

6. getwindowhandle()

7. getwindowhandles ()

8. manage()

9. navigate ()

10. quite ()

11. switchTo()

----

1. close - To close the browser.

Driver.close(). Return type is void.

2. get - To load the url.

Driver.get("String args"). Return type is void.

3. gettitle - To get the current page title.

Driver.gettitle() return type is String.

4. getpagesource - For current pageSource.

Driver.getpagesource() .Return type is String.

5. getcurrentUrl - For current page url.

Driver.getcurrenturl(). Return type is String.

6. getwindowhandle - For get parent windowhandle.

Driver.getwindowhandle() .Return type is String.

7. getwindowhandles - For get parent and child windowhandle

Driver.getwindowhandle() .Return type is set<String>.

8. manage - Return type is option interface

An interface for managing stuff you would do in a browser menu.

Driver.manage();

9. navigate - An abstraction allowing the driver to access the browser's history and to navigate to a given

return A {@link org.openqa.selenium.WebDriver.Navigation} that allows the selection of what to do next.

Driver.navigate();

10. quit - To close the browser

Driver.quit() - Return type is void.

11. switchTo-for switching to frame or window

Driver.switchTo() - Return A TargetLocator which can be used to select a frame or window.

<u>**METHODS OF WEBELEMENTS.**</u>

1. clear ()

2. click()

3. getAttribute()

4. getcssvalue()

5. getLocation()

6. getText()

7. getRect()

8. findElement()

9. findElements()

1. clear - It will clear the text in the webelements.

Return type is void.

2. click - It will click on the webelements

Return type is void.

3. getAttribute - If the element is currently selected or checked, false otherwise.

It will take String as an argument return type is String.

4. getcssvalue() - It will return String and the argument it will take it is also String.

5. getLocation() - It will return point class object which will give location of a webelement in the form of x-axis and y-axis.

6. getText() - It will return the inner text of a webelement.

Return type is String.

7. getRect() - Return type is Rectangle class object.

8. findElement() - It will take By class as an argument return type is webelement

9. findElements() - It will take By class as an argument return type is List<webelement>

How to Launch Browser.

To launch a Browser we have to creat an object of

```
WebDriver driver = new ChromeDriver();
```

In order to lauch a chrome .

```
WebDriver driver = new firefoxDriver();
```

In order to launch a firefox.

What is System.setProperty(key,value)?

System is an inbuilt class present in java.lang. setProperty is static method present in system class ,it will take String argument in the form of key and value pair where key is which browser we want to open and value is path of the driver executable files.

How to maximize a browser?

To maximize a browser we have to go for constructor chaining.

```
driver.manage().window().maximize();
```

How to load URL?

In Two ways we can load the url

1. driver.get("url");

2. driver.navigate.to("url");

ACTION CLASS

In order to do action events, you need to use org.openqa.selenium.interactions Actions class. The user-facing API for emulating complex user gestures. Use the selenium actions class rather than using the Keyboard or Mouse directly. This API includes actions such as drag and drop, clicking multiple elements.

Webdriver driver;

Actions a= new Action(driver);

It will take webdriver as an argument .

Webelement ele;

Methods of Actions class.

1. moveToElement()
2. contextClick()
3. dragAndDrop()

For Mouse over Action we have moveToElement(), it will take webelements as an argument.

a.moveToElement(ele).build().perform();

build = The build() method is used to compile all the listed actions into a single step.

Perform = A convenience method for performing the actions without calling build() first

For Right Click we have contextClick(), it will take webelement as an argument.

a.contextClick(ele).build().perform();

For Double Click we have doubleClick it will take webelement as an arguments

a.doubleClick(ele).build().perform();

For Drage and Drop we have drageanddropBy it will take three arguments webelement, x and y axis.

a.dragAndDropBy(ele, x, y).build().perform();

ROBOT CLASS

To perform keyboard Actions we go for Robot Class like open new tab, new window.it is coming from java.awt.

```
    Robot r = new Robot();
    r.keyPress(KeyEvent);
// it will take keyEvent as an argument.
    r.keyRelease(KeyEvent);
```

Select Class.

Any tag which is developed using Select tag (<Select></select>) to perform some action on that we go for Select class.

```
      Select s= new Select(Webelement);
```

We can select the element by index,value,visible text.

s.selectByIndex(int i); //it will take int as an argument .

s.selectByValue(String str); //it will take String as an argument.

To get all option in list box we go for **s.getOptions();** //it will return List<webelement>.

To select multiple option we can go for **isMultiple();** // it will return Boolean value.

To get all selected option we can go for **s.getAllSelectedOptions();** // it will return List<webelement>.

To know which option get selected 1st we go for **s.getFirstSelectedOption().getText()**; // it will return String.

How to Switch to frames.

To Switching to frames we have to go for driver.switchTo().frame();

It is overloaded, we can switch in three ways

1st by index

driver.switchTo().frame(0); //where we have to pass index in int.

2nd by name

driver.switchTo().frame(“frame name”); // it will take String as an argument where String is an name of frame .

3rd by Webelement

driver.switchTo().frame(Webelement); //it will take webelement as an argument where webelement is the frame .

How to get the location of a webelement.

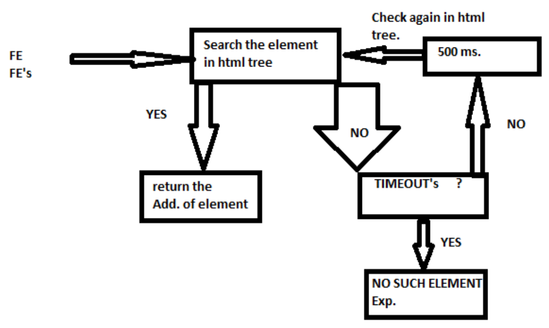
To get the location of a particular webelement we have to find the webelement and store in to one variable then using that variable we have to call getlocation() method .

Webelement Loc=Ele.getLocation();

```
Point loc = ele.getLocation();
        int x = loc.getX();
        int y = loc.getY();
        System.out.println(x);
        System.out.println(y);
        System.out.println(loc);
```

Synchronization.

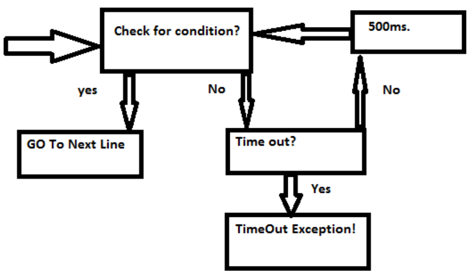
IMPLICIT WAITS


FE
FE's
Search the element in html tree
Check again in html tree.
500 ms.
YES
NO
NO
return the Add. of element
TIMEOUT's ?
YES
NO SUCH ELEMENT Exp.

IMPLICIT WAITS will go with FindElement and FindElements, and will check the element in html tree if it find the element then it will return the Address of the webelement, if no then it will check for the time out if time out is over then it will return the NoSuchElementExcp. Else it will check for the element in html tree again.

Here time unit will be in sce,min,mSec.microSec. driver.manage().timeouts().implicitlyWait(10, TimeUnit.SECONDS);

Explicit Waits.



Explicit wt. will check for the condition if condition is true the it will go to next line ,if condition is not true the it will go and check for time out if time out is over then it will give timeout Excp. Else after 500ms. It will go and check the condition again.

WebDriverWait ww = new WebDriverWait(driver, 15);

ww.until(ExpectedCondition (ele));

until is non Static methods which is present in webDriverWait class which will take ExpectedCondition class as an argument.

Handling PopUps.

We have four type of popups.

1.Window popup

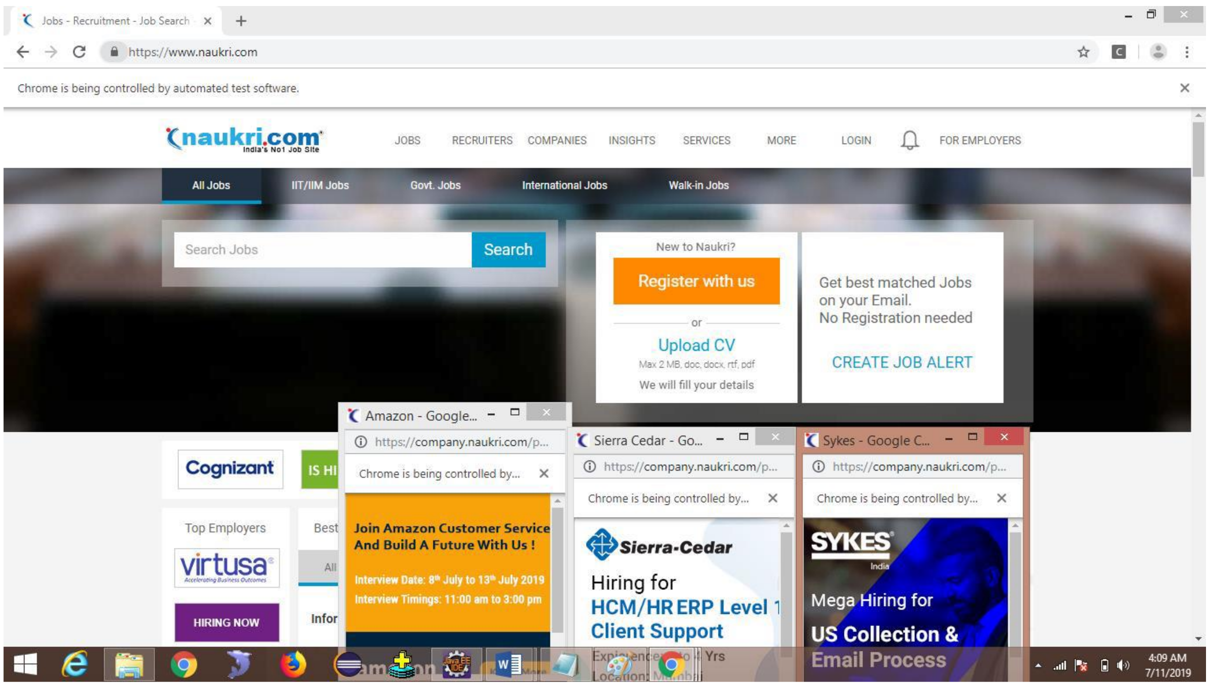
2.Notification popup

3.Alert popup

4.upload popup

Window popup

We can handle window popup by using getwindowhandle() and getwindowhandles() both are present in webdriver.


Jobs - Recruitment - Job Search
https://www.naukri.com
Chrome is being controlled by automated test software.
naukri.com
JOBS
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International Jobs
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Search Jobs
Search
New to Naukri?
Register with us
Upload CV
Get best matched Jobs on your Email. No Registration needed
CREATE JOB ALERT
Amazon - Google...
Sierra Cedar - Go...
Sykes - Google C...
https://company.naukri.com/p...
Join Amazon Customer Service And Build A Future With Us !
Hiring for HCM/HR ERP Level 1 Client Support
Mega Hiring for US Collection & Email Process
4:09 AM
7/11/2019

With parent browser 3 child browser also came.

Code to close only child browser

```
driver.get("https://www.naukri.com/");
String parent = driver.getWindowHandle();
System.out.println(parent);
Set<String> Win = driver.getWindowHandles();
Win.remove(parent);
for (String CWin : Win) {
Thread.sleep(2000);
System.out.println(CWin);
driver.switchTo().window(CWin);
driver.close();
}
```

Code to close browser in revers order

```
driver.get("https://www.naukri.com/");
String parent = driver.getWindowHandle();
System.out.println(parent);
```

```
Set<String> Win = driver.getWindowHandles();

ArrayList<String> a = new ArrayList<>(Win);

System.out.println(a);

for (int i = a.size() - 1; i >= 0; i--) {

driver.switchTo().window(a.get(i));

driver.close();

}

}
```

Since set is not index based so we have to convert set to ArrayList the we have to close it.

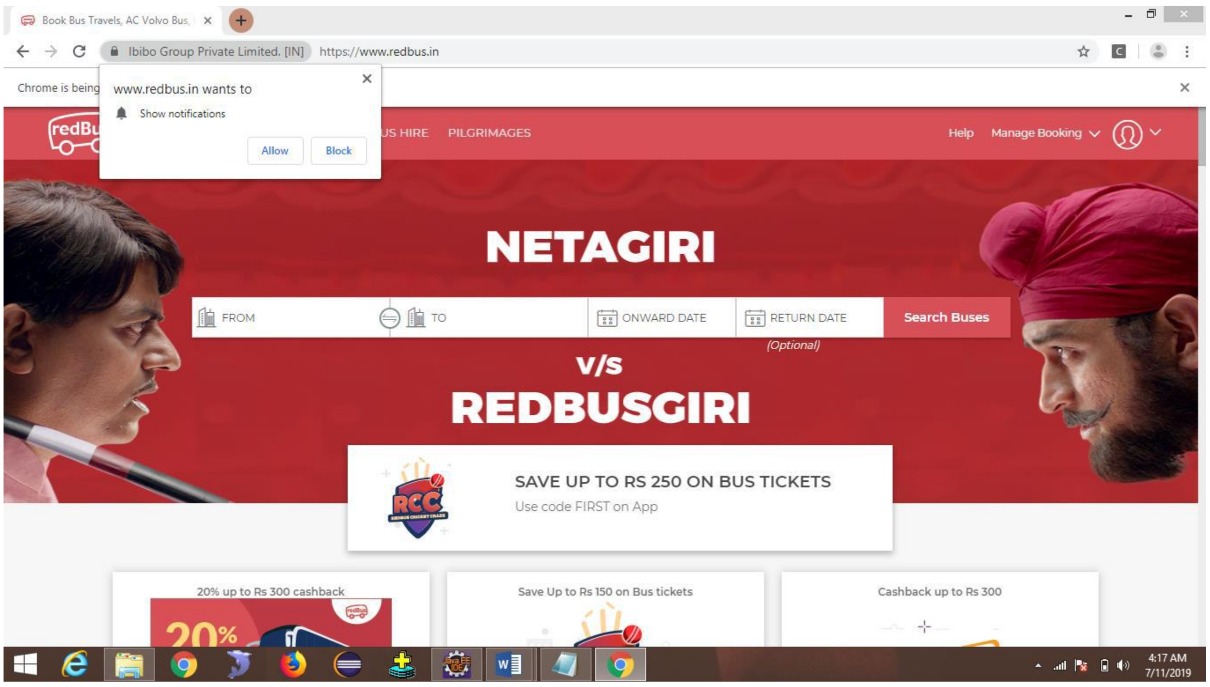
<u>Notification popup</u>

Code to close notification popup.

```
        ChromeOptions co = new ChromeOptions();

         co.addArguments("--disable-notifications");

WebDriver driver = new ChromeDriver(co);

            driver.manage().window().maximize();

           driver.get("https://www.redbus.in/");
```

to handle notification popup we have to make the object of chromeOption class and we have to add the argument

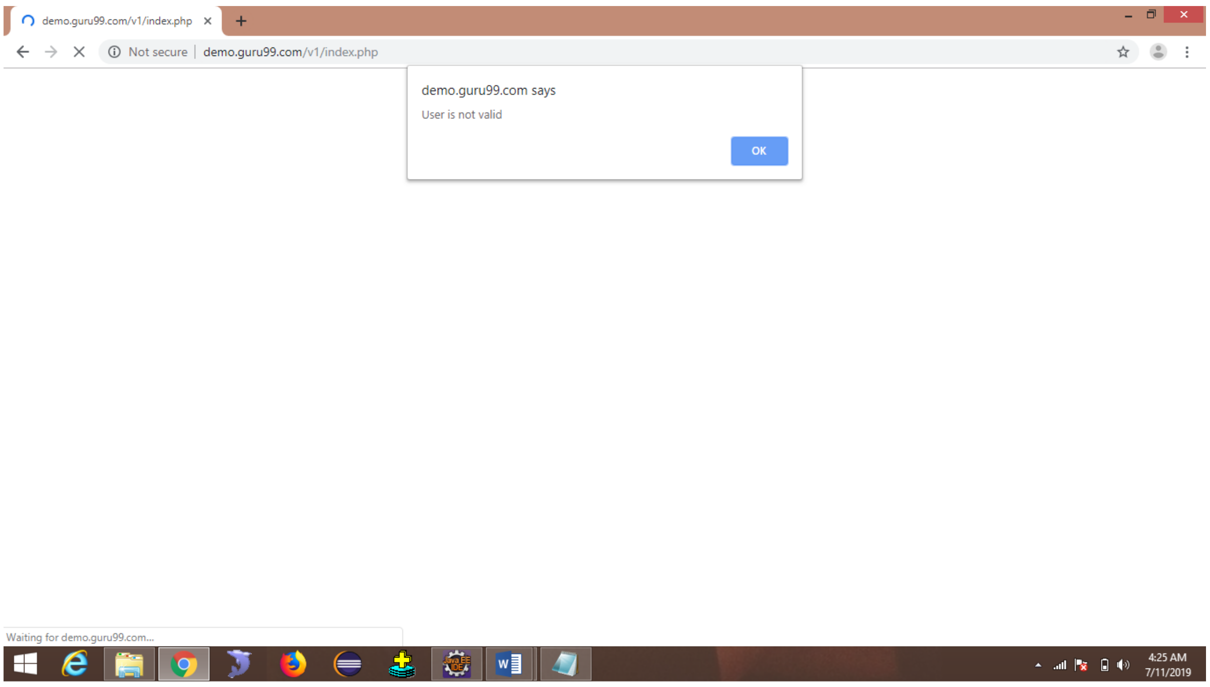
andl we have to pass the object of chromeOption in chromeDriver().


www.redbus.in wants to

Show notifications

Allow Block

Alert popup


demo.guru99.com says

User is not valid

To handle the alert popup we have to switch to the

Alert ,using

```
 driver.switchTo().alert();
```

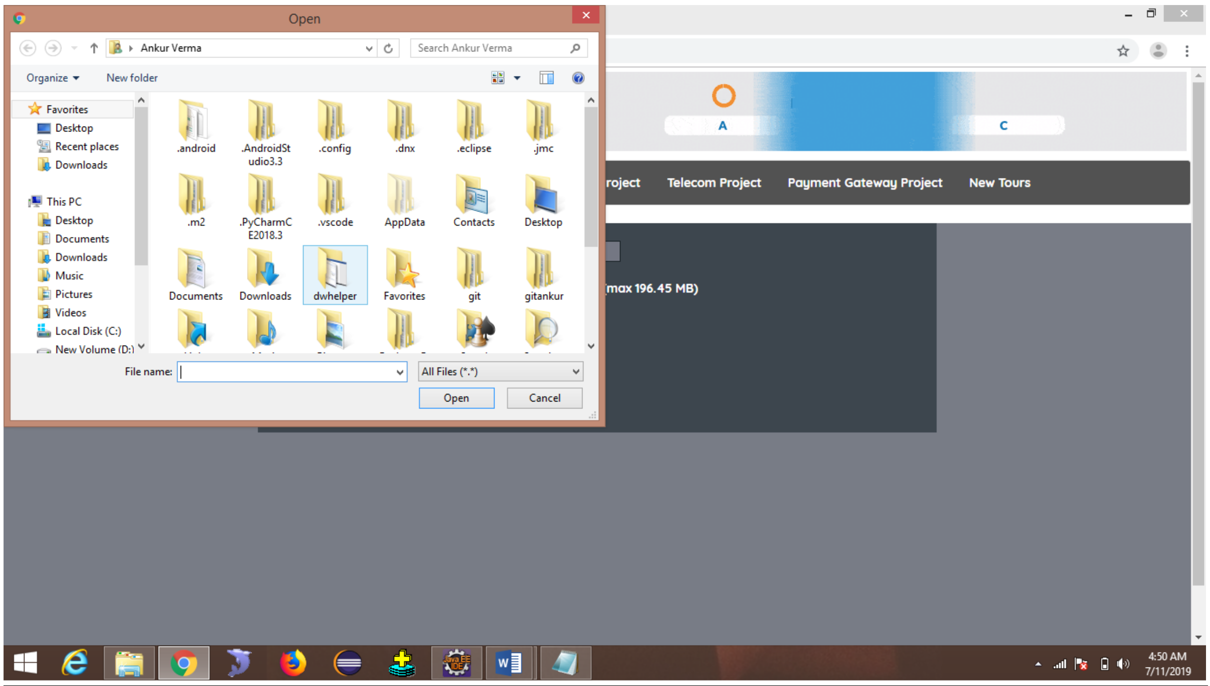
it will return Alert class object.

```
Alert a = driver.switchTo().alert();
```

It will come with three options

```
a.accept()//to accept it
a.dismiss()//to reject it
a.sendKeys()//to send some data.
```

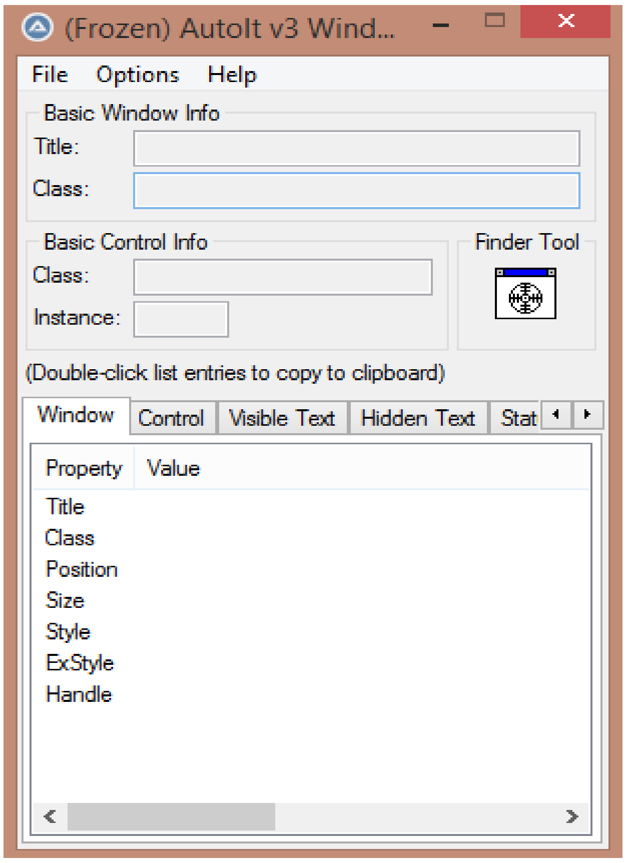
Upload popup

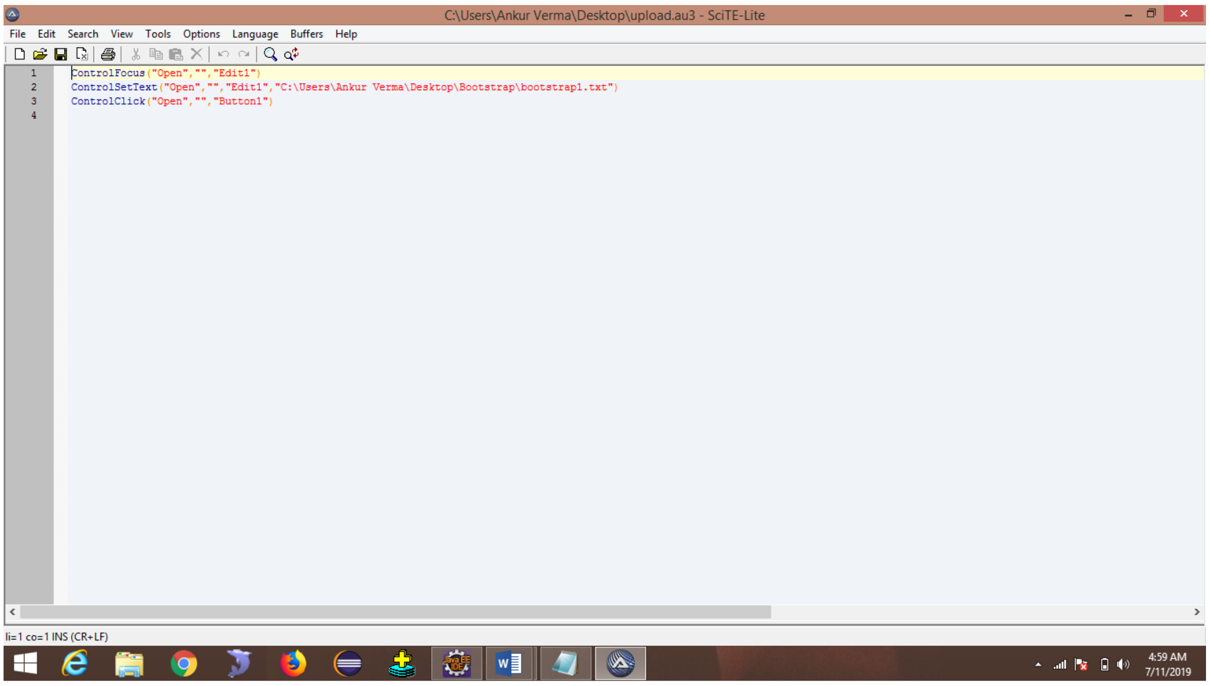


To handle this kind of popup we have to take help of AutoIt we have to install this software.

We have to move the finder tool to the path and the open button and we have to take the id and title.

Then we have to write the AutoIt Script.




C:\Users\Ankur Verma\Desktop\upload.au3 - SciTE-Lite
File Edit Search View Tools Options Language Buffers Help
li=1 co=1 INS (CR+LF)
4:59 AM
7/11/2019

```
ControlFocus("Open","","Edit1")
ControlSetText("Open","","Edit1","C:\Users\Ankur Verma\Desktop\Bootstrap\bootstrap1.txt")
ControlClick("Open","","Button1")
```

ControlFocus("Open","","Edit1")

ControlSetText("Open","","Edit1","C:\Users\Ankur Verma\Desktop\Bootstrap\bootstrap1.txt")

ControlClick("Open","","Button1")

The we have to compile the script and we will get Exe file we have to mention that path in script.

driver.get("http://demo.guru99.com/test/upload/");

WebElement upload = driver.findElement(By.id("uploadfile_0"));

upload.click();

Runtime.getRuntime().exec("C:\\Users\\AnkurVerma\\Desktop\\uplod.exe");

<u>Take Screen Shot.</u>

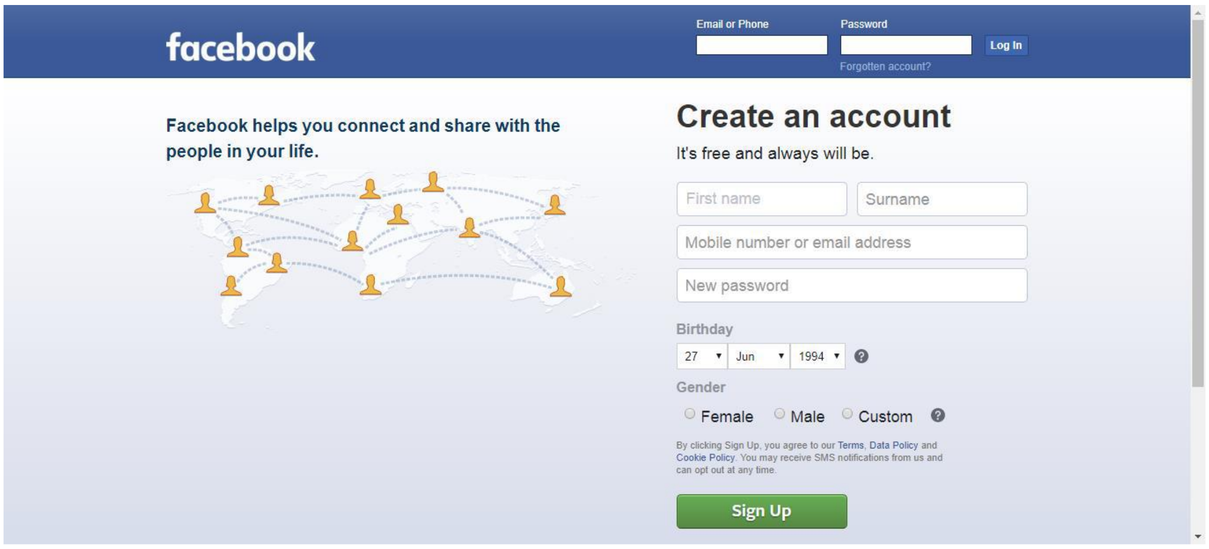
To take the screenshot we have to cast the driver to takescreenShot and get the use of getScreenshotAs() it will take OutputType.File, outputtype is an Interface and File is method.return type of this method is File class object

The we have to make the object of File class and we have to pass the oath of location where we want to save our screenshot.

And we have make the use of Files class which is present in google.common.io.file packages and we have to use static method called copy which will take two argument from file and to file to copy img. From that think and pest into file.

To get the screenshot refresh the folder.

```
TakesScreenshot ts = (TakesScreenshot) driver;

File ScreenS = ts.getScreenshotAs(OutputType.FILE);

File ss = new File("./ScreenS/" + name + ".png");

Files.copy(ScreenS, ss);
```



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Email or Phone | Password | Log In

Forgotten account?

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Create an account

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First name | Surname

Mobile number or email address

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Birthday

27 | Jun | 1994

Gender

Female | Male | Custom

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<u>Java Script Executor</u>.

To perform the scroll operation we have to go for Java Script Executor.

Scroll operation –like scroll-up, scroll-down, scroll-left, scroll-right.

To make use of java-script-executor we have to cast the webdriver object to javaScriptExecutor.

```
WebDriver driver= new ChromeDriver();

JavascriptExecutor js = (JavascriptExecutor) driver;
```

In javaScriptExecutor we have one method called executeScript() in side this we have to write the script.

scroll-Down

```
js.executeScript("window.scrollBy(0,1000)");
```

In this we have to write the index up-to where we want to scroll in y-axis and we have to make x-axis 0.

scroll-up

```
js.executeScript("window.scrollBy(0,-500)");
```

If want to go up we have to put –ve axis in place of y-axis.

scroll-right

js.executeScript("window.scrollBy(1000, 0)");

In this we have to write the index up-to where we want to scroll in x-axis and we have to make y-axis 0.

scroll-left

js.executeScript("window.scrollBy(-500, 0)");

If want to go up we have to put –ve axis in place of x-axis.

scroll-Till a webelement

js.executeScript("arguments[0].scrollIntoView()", ele);

To scroll till a webelement we have store the webelement in variable and we have to pass the variable in the method.

scroll-fullDown

js.executeScript("window.scrollTo(0,document.body.scrollHeight)");

scroll-fullright

js.executeScript("window.scrollTo(document.body.scrollWidth,0)");

<u>Read Data From Xml.</u>

To read the data from xml file we have to make use of poi-jar's .we have add those jar to build path. After that we have make the object the fileInputStream and pass the path of xml file, after that we have to call a static method create() which is present in WorkBookFactory class and it will take fileInputStream object as an argument and it will return Workbook interface object.after that we have to call a non static method getSheet which will take String sheet name as an argument and it will return sheet interface object. In Sheet interface we have on method called getRow which will take int as argument from which row we want to read the data,it will return Row interface object.we have to take two for loop to read data from xml because it in the form of Two-D array.

```
FileInputStream fis = new FileInputStream("./Softwares/read.xlsx");

Workbook w = WorkbookFactory.create(fis);

Sheet sh = w.getSheet("Sheet1");

Row firstRow = sh.getRow(0);

int rowcount = sh.getPhysicalNumberOfRows();

for (int i = 0; i < rowcount; i++) {

for (int j = 0; j < firstRow.getLastCellNum(); j++) {
```

```
Cell cl = sh.getRow(i).getCell(j);

System.out.println(cl);

}

}
```

Write Data in to xml.

To write the data from xml file we have to make use of poi-jar's .we have add those jar to build path. After that we have make the object the fileInputStream and pass the path of xml file, after that we have to call a static method create() which is present in WorkBookFactory class and it will take fileInputStream object as an argument and it will return Workbook interface object.after that we have to call a non static method getSheet which will take String sheet name as an argument and it will return sheet interface object. In Sheet interface we have on method called creatRow which will take int as argument from which row we want to store data and we have to call createcell which will take int as an argument and we have to call setCellValue which will take String as an argument fileOutputStream and we have pass the xml file location ,then we have to call write method which is present in workbook interface and it will take fileOutputStream as an argument .At last we have to close the Workbook using close method.

```
FileInputStream fis = new FileInputStream("D:\\Urban.xlsx");

Workbook wb = WorkbookFactory.create(fis);

wb.getSheet(sheet).createRow(row).

createCell(col).setCellValue(data);

FileOutputStream fio = new FileOutputStream("D:\\Urban.xlsx");

wb.write(fio);

wb.close();
```

POM (PAGE OBJECT MODEL)

Stale Element Reference Exception to avoid this exception we go for pom class.

Stale element reference exception means the reference of the element is old.

After finding the element & before performing any action on that element if we page is refreshed we get **Stale element reference Exception.**

Pom class is use to test the web pages.in POM class we have @FindBy annotation to find Webelement.

@FindBy(name="Username") we can go for any locators inside findBy annotation.

In order to initialize all the elements present in specified POM class we go for

```
pageFactory.initElements(webdriver,POMObject);

pageFactory.initElements(webdriver,this);
```

In pom we have to define methods of every webelement which we are performing on that webelement.

```
public class SeleniumHome {

@FindBy(id = "q")

private WebElement search;

@FindBy(id = "submit")

private WebElement go;

public SeleniumHome(WebDriver driver) {

PageFactory.initElements(driver, this);

}

public void sendText(String str) {

search.sendKeys(str);

}

public void Click() {

go.click();

}

public void clear() {

search.clear();

}

}
```

In order to use we have to call every method of pom class.all method are non-static so we have to make object and we have to call it.

```
System.setProperty("webdriver.chrome.driver", "./Softwares/chromedriver.exe");

WebDriver driver = new ChromeDriver();

driver.manage().window().maximize();

driver.get("https://www.seleniumhq.org/");

Thread.sleep(2000);

SeleniumHome sh = new SeleniumHome(driver);

sh.sendText("java");
sh.Click();

Thread.sleep(2000);

driver.navigate().back();

Thread.sleep(2000);

sh.clear();

Thread.sleep(2000);

sh.sendText("selenium");

sh.Click();
```