Selenium automates browsers. That’s it. What you do with that power is entirely up to you. Primarily it is used for automating web applications for testing purposes

Selenium is an Open source automation Testing tool.

It is exclusively used for Web Based application

Selenium supports multiple browsers – Chrome, FireFox, Internet Explorer, Safari

Selenium works with multiple platforms Linux, Windows, Apple OS X.

Selenium can be coded in multiple languages – Java, C#, Python, php, Ruby

Selenium has different tools Selenium WebDriver and Selenium IDE

Selenium IDE – No one uses this because it’ just record and playback. IDE is for someone who doesn’t have knowledge on coding where they just record and playback

Selenium WebDriver – This is totally used where you can code for the requirements for automation testing

Before Selenium WebDriver there was Selenium RC but that was deprecated.

Selenium WebDriver Architecture :



* After you trigger the Test, complete Selenium code (Client) which we have written will be converted to Json format
* Generated Json is sent to Browser Driver (Server) through http Protocol

Note: Each browser contains a separate browser driver

* Browser drivers communicate with its respective browser and executes the commands by interpreting Json which it received on the browser.
* Browser Driver receives responses back from the browser and it sends JSON response back to Client.

**5 Step by Step instructions to run first basic Selenium Program**

1. Install Java and Set Java Home Path in System variables
2. Install Eclipse and create new Maven Project with Selenium Dependencies
3. Understand creation of WebDriver object and its related classes
4. Run the First Selenium WebDriver Program with Browser Invocation
5. Different ways of setting Browser Driver executable files

Creating first Selenium Program -

1. **What is Interface in Java?**

An interface is a group of related methods with empty bodies.

Its class responsibility to implement the methods declared in the Interface

When class agreed to implement the interface, they must need to provide implementation/bodies to all the defined methods in Interface

In simple terms, Interface enforces the Contract to class to follow.

2. **WebDriver is an Interface which provides Set of Browser Automation methods with empty bodies (Abstract methods)**

Classes like ChromeDriver, FirefoxDriver, MicrosoftEdgeDriver , SafariDriver etc implement the WebDriver Interface

and provide their own implementation to the WebDriver methods

3. **We need to create the object of the class to access the methods present in the class.**

ChromeDriver driver = new ChromeDriver ();

driver object here has access to all the methods of Chrome driver

WebDriver driver = new ChromeDriver ();

driver object here has access to the methods of Chrome driver which are defined in web Driver Interface

Below is basic and First Selenium program for invoking a browser

**import** org.openqa.selenium.chrome.ChromeDriver;

**public** **class** Selenium1 {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

//Below is the driver extension that is required to invoke the browser

System.*setProperty*("webdriver.chrome.driver", "E:\\Selenium\\chromedriver.exe");

//Invoking Browser

ChromeDriver driver =**new** ChromeDriver();

}

}

Below is an example for getting title of a page

**import** org.openqa.selenium.chrome.ChromeDriver;

**public** **class** Selenium1 {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

//Below is the driver extension that is required to invoke the browser

System.*setProperty*("webdriver.chrome.driver", "E:\\Selenium\\chromedriver.exe");

//Invoking Browser

ChromeDriver driver =**new** ChromeDriver();

driver.get("https://rahulshettyacademy.com");

System.***out***.println(driver.getTitle());

driver.close();

}

}

In a case where you want to see if it’s actual page or it’s redirecting to some other page we can use below

**import** org.openqa.selenium.chrome.ChromeDriver;

**public** **class** Selenium1 {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

//Below is the driver extension that is required to invoke the browser

System.*setProperty*("webdriver.chrome.driver", "E:\\Selenium\\chromedriver.exe");

//Invoking Browser

ChromeDriver driver =**new** ChromeDriver();

String s1 ="https://rahulshettyacademy.com/";

driver.get(s1);

System.***out***.println(driver.getCurrentUrl());

String s2 =driver.getCurrentUrl();

**if**(s1.equalsIgnoreCase(s2)) {

System.***out***.println("Same URL not redirected to ther");

}**else** {

System.***out***.println("Redirected to other page");

}

driver.close();

}

}

Difference between drive.close() and driver.quit()

Close – Only closes that particular current window

Quit – will closes all the associated driver windows which got opened by selenium

In a case where a scripts opens multiple windows then we need to use quit and if you know that your script works only on one window then you can use close method

Below is the example for invoking other Browsers like Firefox

public class SelIntroduction {

public static void main(String[] args) {

//Invoking Browser

//Chrome - ChromeDriver exten->Methods close get

//Firefox- FirefoxDriver ->methods close get

// WebDriver  close  get

//WebDriver methods + class methods

//Firefox

System.setProperty("webdriver.gecko.driver", "/Users/rahulshetty/Documents/geckodriver");

WebDriver driver1 = new FirefoxDriver();

//Microsoft Edge

System.setProperty("webdriver.edge.driver", "/Users/rahulshetty/Documents/msedgedriver");

WebDriver driver2 = new EdgeDriver();

driver.get("https://rahulshettyacademy.com");

System.out.println(driver.getTitle());

System.out.println(driver.getCurrentUrl());

driver.close();

//driver.quit();

}

}

Selenium Web Driver Locators

* As part of Automation, Selenium Performs actions (such as click, typing) on the Page HTML Elements.
* The Locators are the way to identify an *HTML* element on a web page.   
  Selenium WebDriver uses any of the below locators to identify the element on the page and performs the Action

**ID**

**Xpath**

**CSS Selector**

**name**

**Class Name**

**Tag Name**

**Link Text**

**Partial Link Text**

**Locator – ID :**

<input type="text" placeholder="Username" id= “inputUsername” value=" ">

Input -> tag name

Red-> attribute   
Green-> attribute associated value.

Below is an example of Locator ID, I have used name and classname as well

**import** org.openqa.selenium.By;

**import** org.openqa.selenium.chrome.ChromeDriver;

**public** **class** Selenium1 {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

//Below is the driver extension that is required to invoke the browser

System.*setProperty*("webdriver.chrome.driver", "E:\\Selenium\\chromedriver.exe");

//Invoking Browser

ChromeDriver driver =**new** ChromeDriver();

String s1 ="https://rahulshettyacademy.com/locatorspractice/";

driver.get(s1);

driver.findElement(By.*id*("inputUsername")).sendKeys("lokesh");

driver.findElement(By.*name*("inputPassword")).sendKeys("rahulshettyacademy");

driver.findElement(By.*className*("signInBtn")).click();

driver.close();

}

}

**Css Selector-**

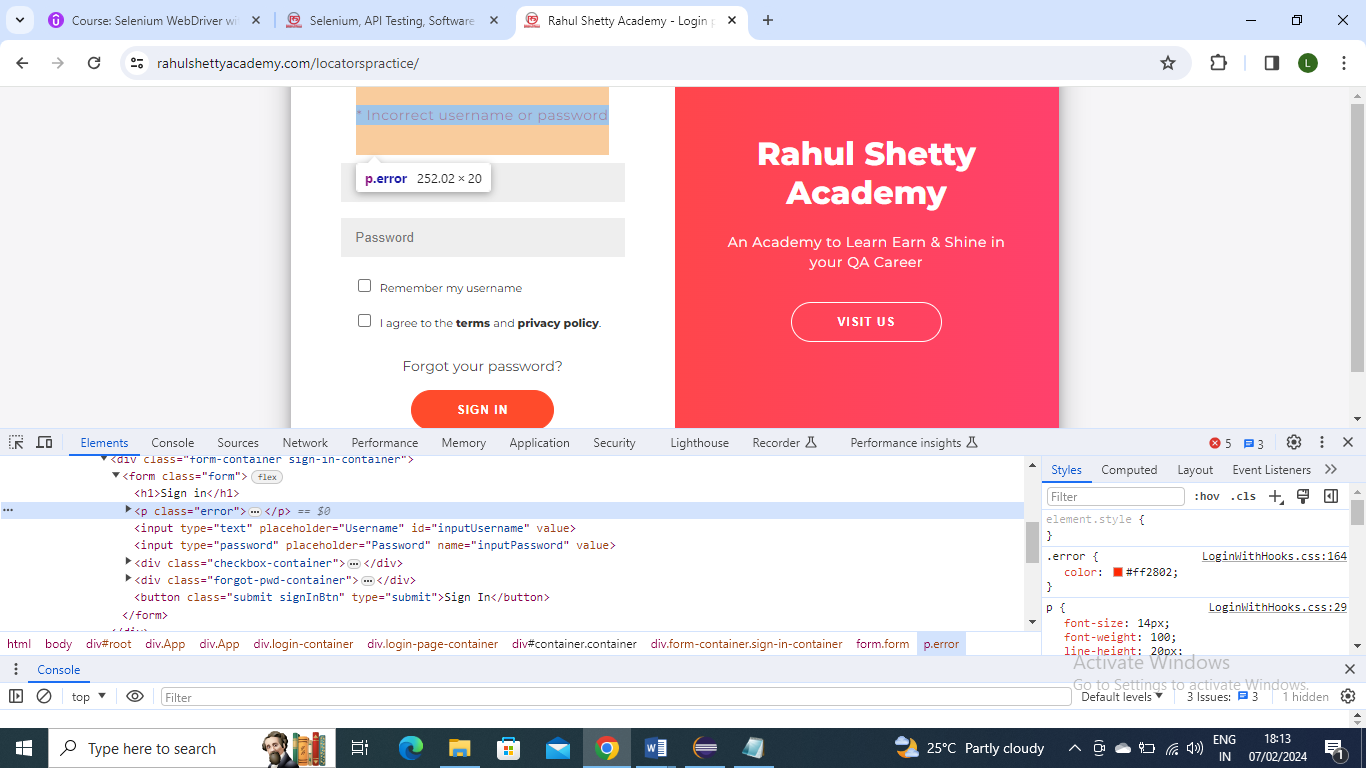
* **Class name -> tagname.classname ->** Button.signInBtn -> .error
* **Id -> tagname#id** -> input#inputUsername
* **Tagname[attribute=’value’]**

<input type="text" placeholder="Username” value=" ">

Input [placeholder=’ Username’]

* **//Tagname[@attribute=’value’]:nth-child(index). - Child items**
* **Parenttagname childtagname**
* **input[type\*='pass'] – CSS**
* **tagname**

In below example we are trying to show the error which is in CSS selector by providing wrong login credentials



**import** java.time.Duration;

**import** org.openqa.selenium.By;

**import** org.openqa.selenium.chrome.ChromeDriver;

**public** **class** Selenium1 {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

//Below is the driver extension that is required to invoke the browser

System.*setProperty*("webdriver.chrome.driver", "E:\\Selenium\\chromedriver.exe");

//Invoking Browser

ChromeDriver driver =**new** ChromeDriver();

String s1 ="https://rahulshettyacademy.com/locatorspractice/";

driver.get(s1);

driver.manage().timeouts().implicitlyWait(Duration.*ofSeconds*(5));

driver.findElement(By.*id*("inputUsername")).sendKeys("lokesh");

driver.findElement(By.*name*("inputPassword")).sendKeys("rahulshettyacademmmmm");

driver.findElement(By.*className*("signInBtn")).click();

System.***out***.println(driver.findElement(By.*cssSelector*("p.error")).getText());

driver.close();

}

}

**Xpath –**

* **//Tagname[@attribute=’value’]**

**//input[@**placeholder=’ Username’’]

**<input type="text" placeholder="Name">**

**//input[@**placeholder=’ **Name’**]

* **//Tagname[@attribute=’value’][index]**
* **//parentTagname/childTagname**
* **//button[contains(@class,'submit')]. – Regular expression**
* **//tagname**
* **//header/div/button[1]/following-sibling::button[1]**
* **//header/div/button[1]/parent::div**

Below is an example where we are clicking forgot password by Linktext locator and passing values to name using xpath locator

**import** java.time.Duration;

**import** org.openqa.selenium.By;

**import** org.openqa.selenium.chrome.ChromeDriver;

**public** **class** Selenium1 {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

//Below is the driver extension that is required to invoke the browser

System.*setProperty*("webdriver.chrome.driver", "E:\\Selenium\\chromedriver.exe");

//Invoking Browser

ChromeDriver driver =**new** ChromeDriver();

String s1 ="https://rahulshettyacademy.com/locatorspractice/";

driver.get(s1);

driver.manage().timeouts().implicitlyWait(Duration.*ofSeconds*(5));

driver.findElement(By.*id*("inputUsername")).sendKeys("lokesh");

driver.findElement(By.*name*("inputPassword")).sendKeys("rahulshettyacademmmmm");

driver.findElement(By.*className*("signInBtn")).click();

System.***out***.println(driver.findElement(By.*cssSelector*("p.error")).getText());

driver.findElement(By.*linkText*("Forgot your password?")).click();

driver.findElement(By.*xpath*("//input[@placeholder='Name']")).sendKeys("abc");

//driver.close();

}

}

Below is an example where say there is no placeholder and all have just input type as text for three fields we can use index number to mention for which one to send values or something

**import** java.time.Duration;

**import** org.openqa.selenium.By;

**import** org.openqa.selenium.chrome.ChromeDriver;

**public** **class** Selenium1 {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

//Below is the driver extension that is required to invoke the browser

System.*setProperty*("webdriver.chrome.driver", "E:\\Selenium\\chromedriver.exe");

//Invoking Browser

ChromeDriver driver =**new** ChromeDriver();

String s1 ="https://rahulshettyacademy.com/locatorspractice/";

driver.get(s1);

driver.manage().timeouts().implicitlyWait(Duration.*ofSeconds*(5));

driver.findElement(By.*id*("inputUsername")).sendKeys("lokesh");

driver.findElement(By.*name*("inputPassword")).sendKeys("rahulshettyacademmmmm");

driver.findElement(By.*className*("signInBtn")).click();

System.***out***.println(driver.findElement(By.*cssSelector*("p.error")).getText());

driver.findElement(By.*linkText*("Forgot your password?")).click();

driver.findElement(By.*xpath*("//input[@placeholder='Name']")).sendKeys("abc");

driver.findElement(By.*xpath*("//input[@type=\"text\"][2]")).sendKeys("abc@gmail.com");

driver.findElement(By.*xpath*("//input[@placeholder='Email']")).clear();

//driver.close();

}

}

Below is an example where say there` is no placeholder and all have just input type as text for three fields we can use other than above to get from index number to mention for which one to send values or something and also can use parent child to send values

input[@type=’text’]:nth-child(3)]

//form/input[3]

.reset-pwd-btn

form p

**import** java.time.Duration;

**import** org.openqa.selenium.By;

**import** org.openqa.selenium.chrome.ChromeDriver;

**public** **class** Selenium1 {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

//Below is the driver extension that is required to invoke the browser

System.*setProperty*("webdriver.chrome.driver", "E:\\Selenium\\chromedriver.exe");

//Invoking Browser

ChromeDriver driver =**new** ChromeDriver();

String s1 ="https://rahulshettyacademy.com/locatorspractice/";

driver.get(s1);

driver.manage().timeouts().implicitlyWait(Duration.*ofSeconds*(5));

driver.findElement(By.*id*("inputUsername")).sendKeys("lokesh");

driver.findElement(By.*name*("inputPassword")).sendKeys("rahulshettyacademmmmm");

driver.findElement(By.*className*("signInBtn")).click();

System.***out***.println(driver.findElement(By.*cssSelector*("p.error")).getText());

driver.findElement(By.*linkText*("Forgot your password?")).click();

driver.findElement(By.*xpath*("//input[@placeholder='Name']")).sendKeys("abc");

driver.findElement(By.*xpath*("//input[@type='text'][2]")).sendKeys("abc@gmail.com");

driver.findElement(By.*xpath*("//input[@placeholder='Email']")).clear();

driver.findElement(By.*xpath*("//input[@type='text'][2]")).sendKeys("abc@gm.com");

driver.findElement(By.*xpath*("//form/input[3]")).sendKeys("123");

driver.findElement(By.*cssSelector*(".reset-pwd-btn")).click();

System.***out***.println(driver.findElement(By.*cssSelector*("form p")));

//driver.close();

}

}

We can create a CSS from id value

For example id is name then CSS will become #name

If you want the CSS based on by scanning first 4 few values then you can use below

Input[type\*=’pass’]

Above it will check anywhere if starting with pass present

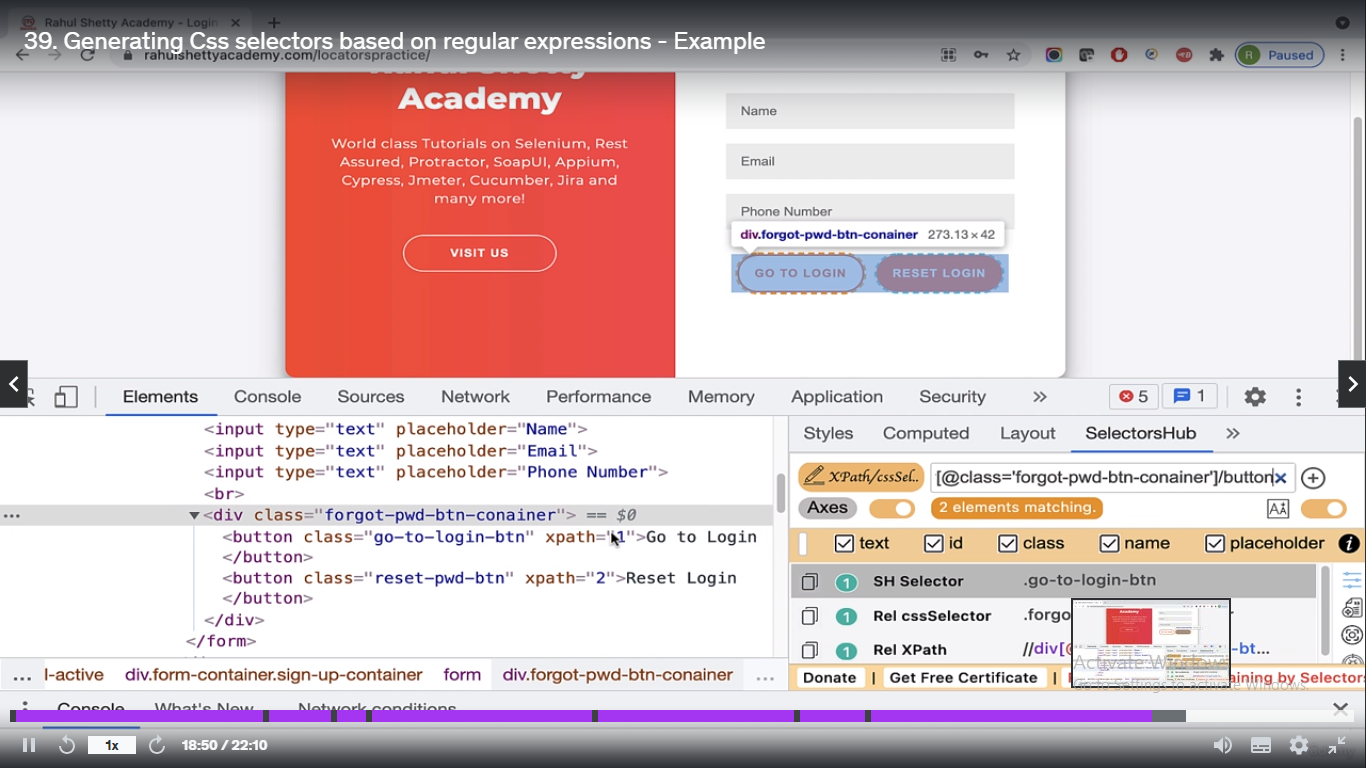
for example

<button class =”submit SignInBtn” type =”submit”>Sign IN </button>

In above say SignInBtn changes frequently and you cannot use css selector on that you can convert into xpath as below

//button[contains(@class,’submit’)]

For example below parent and child using tags you can do below for xpath



//div[@class=’forgot-pwd-btn-conainer’]/button[2]

Below is an example where once login completed you are checking that the title(in paragraph) is matching and also same for representation we used tagname once and css selector once and logout button using xpath

**import** java.time.Duration;

**import** org.checkerframework.dataflow.qual.AssertMethod;

**import** org.openqa.selenium.Alert;

**import** org.openqa.selenium.By;

**import** org.openqa.selenium.chrome.ChromeDriver;

**import** org.testng.\*;

**public** **class** Selenium1 {

**public** **static** **void** main(String[] args) **throws** InterruptedException {

// **TODO** Auto-generated method stub

//Below is the driver extension that is required to invoke the browser

System.*setProperty*("webdriver.chrome.driver", "E:\\Selenium\\chromedriver.exe");

//Invoking Browser

ChromeDriver driver =**new** ChromeDriver();

String s1 ="https://rahulshettyacademy.com/locatorspractice/";

String name="lokesh";

driver.get(s1);

driver.manage().timeouts().implicitlyWait(Duration.*ofSeconds*(5));

driver.findElement(By.*id*("inputUsername")).sendKeys(name);

driver.findElement(By.*name*("inputPassword")).sendKeys(" ");

driver.findElement(By.*className*("signInBtn")).click();

Thread.*sleep*(2000);

System.***out***.println(driver.findElement(By.*tagName*("p")).getText());

Assert.*assertEquals*(driver.findElement(By.*tagName*("p")).getText(), "You are successfully logged in.");

Assert.*assertEquals*(driver.findElement(By.*cssSelector*("div[class='login-container'] h2")).getText(),"Hello "+name+",");

driver.findElement(By.*xpath*("//button[text()='Log Out']")).click();

//driver.close();

}

}

Below is an example to get password by forgot password using another method to get value and pass it or login

**import** java.time.Duration;

**import** org.openqa.selenium.By;

**import** org.openqa.selenium.By.ByCssSelector;

**import** org.openqa.selenium.WebDriver;

**import** org.openqa.selenium.chrome.ChromeDriver;

**public** **class** Selenium1 {

**public** **static** **void** main(String[] args) **throws** InterruptedException {

// **TODO** Auto-generated method stub

//Below is the driver extension that is required to invoke the browser

System.*setProperty*("webdriver.chrome.driver", "E:\\Selenium\\chromedriver.exe");

//Invoking Browser

ChromeDriver driver =**new** ChromeDriver();

String password1=*getPassword*(driver);

String s1 ="https://rahulshettyacademy.com/locatorspractice/";

driver.get(s1);

driver.manage().timeouts().implicitlyWait(Duration.*ofSeconds*(5));

driver.findElement(By.*id*("inputUsername")).sendKeys("lokesh");

driver.findElement(By.*name*("inputPassword")).sendKeys(password1);

driver.findElement(By.*className*("signInBtn")).click();

//driver.close();

}

**public** **static** String getPassword(WebDriver driver) **throws** InterruptedException {

String s2 ="https://rahulshettyacademy.com/locatorspractice/";

driver.get(s2);

Thread.*sleep*(1000);

driver.findElement(By.*linkText*("Forgot your password?")).click();

Thread.*sleep*(1000);

driver.findElement(By.*cssSelector*(".reset-pwd-btn")).click();

String passwordtext = driver.findElement(By.*cssSelector*("form p")).getText();

String[] pwdarray =passwordtext.split("'");

System.***out***.println(pwdarray);

String pwd =pwdarray[1].split("'")[0];

System.***out***.println(pwd);

**return** pwd;

}

}

Below is an example where you get siblings using relative xpath

**import** java.time.Duration;

**import** org.openqa.selenium.By;

**import** org.openqa.selenium.By.ByCssSelector;

**import** org.openqa.selenium.WebDriver;

**import** org.openqa.selenium.chrome.ChromeDriver;

**public** **class** Selenium1 {

**public** **static** **void** main(String[] args) **throws** InterruptedException {

// **TODO** Auto-generated method stub

//Below is the driver extension that is required to invoke the browser

System.*setProperty*("webdriver.chrome.driver", "E:\\Selenium\\chromedriver.exe");

//Invoking Browser

ChromeDriver driver =**new** ChromeDriver();

driver.get("https://rahulshettyacademy.com/AutomationPractice/");

// Sibling Xpath traverse

//header/div/button[1]/following-sibling::button[1]

System.***out***.println(driver.findElement(By.*xpath*("//header/div/button[1]/following-sibling::button[1]")).getText());

//driver.close();

}

}

Below is an example where you get siblings relative xpath traverse where you route to parent and go back to other sibling

**import** java.time.Duration;

**import** org.openqa.selenium.By;

**import** org.openqa.selenium.By.ByCssSelector;

**import** org.openqa.selenium.WebDriver;

**import** org.openqa.selenium.chrome.ChromeDriver;

**public** **class** Selenium1 {

**public** **static** **void** main(String[] args) **throws** InterruptedException {

// **TODO** Auto-generated method stub

//Below is the driver extension that is required to invoke the browser

System.*setProperty*("webdriver.chrome.driver", "E:\\Selenium\\chromedriver.exe");

//Invoking Browser

ChromeDriver driver =**new** ChromeDriver();

driver.get("https://rahulshettyacademy.com/AutomationPractice/");

System.***out***.println(driver.findElement(By.*xpath*("//header/div/button[1]/parent::div/button[2]")).getText());

//driver.close();

}

}

Below is an example where you are navigating from one site to another site and changing window properties like maximizing the window

**import** java.time.Duration;

**import** org.openqa.selenium.By;

**import** org.openqa.selenium.By.ByCssSelector;

**import** org.openqa.selenium.WebDriver;

**import** org.openqa.selenium.chrome.ChromeDriver;

**public** **class** Selenium1 {

**public** **static** **void** main(String[] args) **throws** InterruptedException {

// **TODO** Auto-generated method stub

//Below is the driver extension that is required to invoke the browser

System.*setProperty*("webdriver.chrome.driver", "E:\\Selenium\\chromedriver.exe");

//Invoking Browser

ChromeDriver driver =**new** ChromeDriver();

driver.get("https://www.google.com/");

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

driver.navigate().to("https://rahulshettyacademy.com/");

//driver.close();

}

}