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Software Testing

This is a process of checking **C**orrectness, **C**ompleteness, **S**ecurity and **Q**uality of developed software application.

Manual Testing

Tester is using hand-eye-brain co-ordination

Actions

* Entering the data in text box
* Clicking on buttons
* Selecting options from drop down list, list box, radio button, check box
* Navigating from one page to another
* Mark the test case as pass or fail

Automation testing means performing all above actions via a machine.

Machine in this context is Test Automation Tool.

Every automation tool is a software.

Every tool understands programming language, you are supposed to provide the instructions via any one of the supported programming language. (Selenium – Java, C#. net, JavaScript, Python)

Process of Automation

1. Planning
2. Tool selection
   1. Technology / type of application
   2. Cost of tool
   3. Market presence
   4. Support availability
   5. HR availability
3. Creating the script
4. Creating the test data
5. Executing the script
6. Generating the report
7. Maintance

Selenium

This is a bundle / suite of tools for testing web application.

Components of Selenium

* Selenium IDE
* Selenium Grid
* Selenium RC
* Selenium WebDriver

**Selenium WebDriver**

* This is the tool for testing browser based applications (Web Sites)
* Interface in Java
* API

Pre-Requisite for Selenium WebDriver

1. Minimum Windows 10
2. Minimum Java 11
3. Any one updated browser
4. IDE (Java Editor)
   1. Eclipse
   2. Idea Itellij
5. Selenium WebDriver jar file

**Configuration of Selenium WebDriver**

Create 2 Folders

1. YourName\_SeleniumDemos
2. Selenium Jar Files

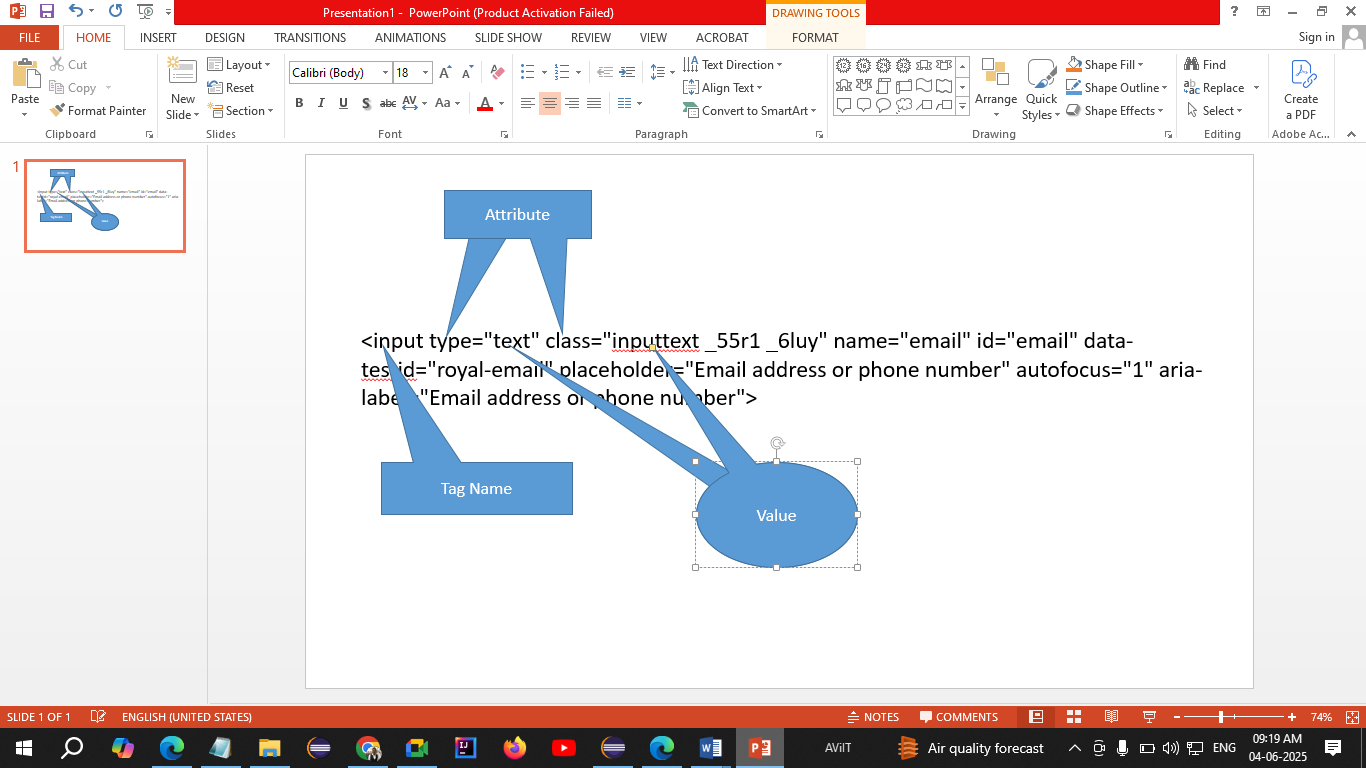
* Open Eclipse
* Create Project
* Create Package
* Create Class
* Right click on Project 🡪 Build Path 🡪 Configure Build Path
* Click on Libraries
* Click on ClassPath
* Click on Add External Jars…
* Select the jar file which we have downloaded from Selenium.dev/downloads site
* Click on Apply and Close

Methods of WebDriver

1. Launching the Browser 🡪 Create object of WebDriver interface.
2. get() 🡪 You can launch any website via URL. (Accepts absolute URL, which starts with http)
3. driver.manage().window().maximize() 🡪 Maximize the browser window
4. close() 🡪 Will close the browser window which is opened by WebDriver object.
5. getTitle() 🡪 Return the title of the page which is opened in browser. (String)
6. getCurrentUrl() 🡪 Returns the URL of the page which is opened in browser. (String)
7. getPageSource() 🡪 Returns the rendered HTML code of the page. (String)
8. findElement() 🡪 Find the single control on the page**. It always located the first occurrence**. Using locator. (WebElement)
9. findElements() 🡪 Used to find multiple controls on the page. (List<WebElement>)

**Common Exceptions in WebDriver**

1. InvalidArgumentException 🡪 If the URL is not in the correct format. URL should be Absolute
2. SessionNotCreated 🡪 The version of WebDriver and browser are mismatch.
3. NoSuchElementException 🡪 Selenium is not able to find the specified control. Possible reasons are
   1. The value of locator is wrong
   2. The value of locator is dynamic
   3. Synchronization issue
4. InvalidSelectorException 🡪 The value of locator is not in the correct format.
5. TimeoutException 🡪 If selenium is not able to load any web page within 30 seconds.



**Locators**

Locators are the way to find any control on the web page.

1. Name
2. Id
3. ClassName
4. CssSelector
5. LinkText
6. PartialLinkText
7. XPath
8. TagName
9. RelativeLocator

**WebElement**

* Every control / html control / web control is treated as WebElement in WebDriver.
* It is an interface in WebDriver API.

Methods of WebElement

1. sendKeys() 🡪 Enters the text in text box. If some text is present in the text box then the new text will appended to the existing text.
2. click() 🡪 Clicks on any control.
3. getText() 🡪 Returns the text on the control. (String)
4. isSelected() 🡪 Checks that whether the check box / radio button is selected or not. (boolean)
5. isEnabled() 🡪 Checks that whether the control is enabled or disabled (boolean)
6. isDisplayed() 🡪 Checks that whether the control is visible or not (boolean)
7. getAttribute() 🡪 Returns the value of any attribute of the control. (String)
8. getDomAttribute() 🡪 Returns the value of any attribute of the control. (String)

**CssSelector**

1. Single Attribute  
   tagName[attribute=”value”]  
   input[data-testid=”royal-email”]
2. Multiple Attributes  
   tagName[attribute1=”value”][attribute2=”value”]
3. Special Characters
   1. ^ 🡪 Starts with
   2. $ 🡪 Ends With
   3. \* 🡪 Contains

**XPath**

XML Path

1. Absolute XPath  
   Starts with html
2. Relative XPath  
   Starts with //
   1. Taking reference of parent tag
   2. Using direct control

Pattankodoli Bus Stand 🡪 Right turn 🡪 Hupare Nagar 🡪 Water Tank 🡪 Lane No 9 🡪 House No 1128

**Handling Drop down list / List box**

* If any one of the control is marked as <select> tag then only selenium treats the control as drop down list / list box.
* Selenium has provided **Select** class to handle drop down list or list box.
* Methods of Select Class
  + getFirstSelectedOption() 🡪 Returns the element / option which is selected from the list. (WebElement)
  + getOptions() 🡪 Returns the list of all the options from the dropdown list. (List<WebElement>)
  + selectByVisibleText() 🡪 Selects the option using the text displayed on the element.
  + selectByValue() 🡪 Selects the option using the value of attribute value.
  + selectByContainsVisibleText() 🡪 You can provide the partial text from the visible text on the element.
  + selectByIndex() 🡪 Selects the option using its 0 based index no.
  + isMultiple() 🡪 Checks whether the control is list box or not. If true means it is list box (boolean)
  + getAllSelectedOptions() 🡪 Returns list of all selected options from List box. (List<WebElement>)

1. Display selected country
2. Display total no of countries
3. Display list of all countries
4. Select Switzerland
5. Display selected country.

**Synchronization**

Synchronization is the process of **adjusting speed of tool with speed of application.**

1. Thread.sleep() 🡪 Pauses the execution of a script for specified milliseconds.
   1. Applicable to single statement only
   2. It takes mandatory delay
2. Implicit Wait
   1. It is applicable throughout the script.
   2. Doesn’t take mandatory delay.
3. Explicit Wait (WebDriverWait)
   1. Applicable to single statement only
   2. Doesn’t take mandatory delay.
   3. You can handle conditions like visibility of element, element to be clickable, alert to be displayed
4. FluentWait
   1. Applicable to single statement only
   2. Doesn’t take mandatory delay.
   3. You can handle conditions like visibility of element, element to be clickable, alert to be displayed
   4. You can handle the exception as well  
      w - withTimeout  
      i - ignoring  
      p - pollingEvery  
      u - until
5. PageLoadTimeout

Handling Table

1. Display all headers
2. Display total no of rows
3. Display any row randomly