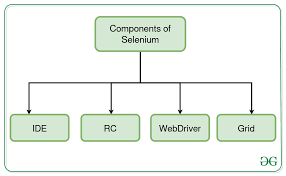
THEORETICAL QUESTIONS: - Done by Shumaila, Abdul, Mohamaed, and Addam Attia

**What is Selenium ?**

Selenium is an open source umbrella project for a range of tools and libraries aimed at supporting browser automation. It provides a playback tool for authoring functional tests across most modern web browsers, without the need to learn a test scripting language.

What are the different components and versions of Selenium?



**What are Locators, different types of locators and their priorities in Selenium?**

Selenium supports 8 different types of locators namely id, name, className, tagName, linkText, partialLinkText, CSS selector and xpath.

**What are the different types of drivers in Selenium WebDriver?**

> ChromeDriver. > For executing Selenium Automation Scripts on Chrome Browser.

> FirefoxDriver. ...

> InternetExplorerDriver. ...

> SafariDriver. ...

> OperaDriver. ...

> EdgeDriver. ...

> EventFiringWebDriver. ...

> RemoteWebDriver.

**How do I launch the browser using WebDriver?**

Download the latest ChromeDriver binary from Chromium.org download page and place the executable on your local machine.

Set the webdriver.chrome.driver property to the chromeDriver.exe's location as- System.setProperty(“webdriver.chrome.driver”, “chromeDriver.exe path”)

**What are the different types of navigation commands in WebDriver?**

driver.navigate().to(“URL”) > To navigate to the provided page URL.

> driver.navigate().back() > To navigate back to the previous page. ...

> driver.navigate().forward() > To navigate forward to the page. ...

> driver.navigate().refresh() > To refresh the page.

**How can you find whether an element is displayed on the screen using Selenium?**

The isDisplayed method in Selenium verifies if a certain element is present and displayed. If the element is displayed, then the value returned is true. If not, then the value returned is false.

**How can we get a text on a web element using Selenium WebDriver?**

This method helps retrieve the text, which is basically the innertext of a WebElement. getText() method returns string as a result. It removes the whitespaces if present in the front and back of the string.

**How to type into a text box using Selenium? How to handle a drop-down field and select a value from it using Selenium?**

To type into the text box we need to choose the sendkeys() and type the text in.

The method getFirstSelectedOption() returns the selected option in the dropdown. Once the option is fetched we can apply getText() method to fetch the text.

**What are the different types of waits available in WebDriver?**

**Implicit Wait in Selenium**

driver.manage().timeouts().implicitlyWait(Duration, TimeUnit.SECONDS);

Explicit Wait

Driver.manage().timeouts.explicitWait(Duration.timeUnite.seconds)

Tread Sleep

Thread.sleep(3000);

Driver.manage().timeouts.explicitWait(Duration.timeUnite.seconds)

**What is the latest Selenium tool?**

latest release is 4.8. 2. Released on March 24, 2023.

**What do we mean by Selenium 1, Selenium 2 and Selenium 3?**

**What is Selenium 2 and Selenium 3?**

Selenium 2's WebDriver provides its own API for interacting with the browser while Selenium 3 requires Browser-specific implementations of the WebDriver, such as GeckoDriver for FireFox. These drivers offer better testing for the platforms they are.

**When should I use Selenium Grid?**

1. To run tests on multiple browsers and their versions, different devices, and operating systems.
2. To reduce the time that a test suite takes to complete execution.

**What is the difference between / and // in XPath?**

Single slash is used to create absolute XPath whereas Double slash is used to create relative XPath.

**What is an XPath?**

XPath is an expression language designed to support the query or transformation of XML documents. It is the selenium locator.

**What is the difference between driver.close() and driver.quit() commands?**

close() closes only the current window on which Selenium is running automated tests. The WebDriver session, however, remains active. On the other hand, the driver. quit() method closes all browser windows and ends the WebDriver session.

**Is WebDriver a class or interface?**

WebDriver is a remote control interface that enables introspection and control of user agents (browsers). The methods in this interface fall into three categories: Control of the browser itself. Selection of WebElements.

**What is the super interface of WebDriver?**

SearchContext is the super interface of WebDriver interface in Selenium WebDriver API.

**How to find more than one web element in to a list?**

findElements() command in WebDriver can be used to find more than one web elements and save them into a list. To add more value to the answer: > If the provided value has the possibility to locate a single element, we can use findElement() command and save them into a variable of WebElement.

**Is FirefoxDriver a class or interface?**

FirefoxDriver is an implementing class of WebDriver interface and the above statement will launch the Firefox browser.

Explain the line of code WebDriver driver = new

FirefoxDriver();?

**WebDriver** is the class here.

**Driver** is use for reference.

**FirefoxDriver();** is use to open browser

**How to handle frames in WebDriver?**

Switching Frames in Selenium using Index.

Switching Frames using Name or ID.

Switching Frames using WebElement.

Switching back to Main Page.

**How to click on hyperlink in Selenium?**

To click a link, we can use the link text locator which matches the text enclosed within the anchor tag.

**What are the programming languages supported by Selenium WebDriver?**

Selenium Web Driver also supports various programming languages, including C#, Java, JavaScript, Ruby, Python, and PHP. Selenium WebDriver is implemented in each of these languages. It offers a base framework to interact with a browser.

**What are the operating systems supported by Selenium WebDriver?**

Selenium WebDriver supports the following: Operation System Support – Windows, Mac OS, Linux, Solaris. Browser Support – Mozilla Firefox, Internet Explorer, Google Chrome 12.0

**Q:What are the browsers supported by Selenium WebDriver?**

A:Selenium WebDriver supports a variety of browsers, including:

* Chrome
* Firefox
* Internet Explorer
* Edge
* Safari
* Opera

**Q:What is the difference between Implicit Wait and Explicit Wait?**

A:

 implicit wait- is a global wait that is applied to all WebDriver operations.

 explicit wait- is a specific wait that is applied to a particular WebDriver operation.

**Q:How to read and verify the text on the tool tip using Selenium WebDriver?**

A: getText() method takes the web element as a parameter and returns the text of the tool tip for that element.

**Q:Can Selenium Automate Desktop Applications?**

A:Yes, Selenium can automate desktop applications using the Selenium IDE which is a Firefox add-on. It  allows you to record and playback user actions on a desktop application.

**Q:What is the main component of Selenium?**

A:The main component of Selenium is the WebDriver API-  a set of classes and methods that allow you to interact with web browsers programmatically.

**Q:What is an XPath?**

A:Xpath means XML Path Language and is a query language used to navigate and select elements from an XML or HTML document.

**Q:The difference between Absolute and Relative XPath with examples?**

A:

Absolute XPath expressions start with the root node of the HTML document and are less flexible than Relative XPath.

Ex:  By.xpath("/html/body/div[1]/div[3]/form/div[1]/div[1]/div[1]/div/div[2]/input")

Relative XPath expressions start with the current node (usually the parent node of the element you want to locate) and are more flexible and recommended to use in Selenium test automation.

Ex: By.xpath("//input[@name='q']")

**Q:What is the disadvantage of Absolute XPath & why is Relative XPath recommended?**

A: Absolute XPath expressions start with the root node of the HTML document and are less flexible than Relative XPath.

**Q:What is an Absolute XPath? Write its syntax?**

A: Absolute XPath is a direct way of finding syntax using Family Tree: ancestor, parent, preceding-sibling, following- sibling, child, descendent.

Ex:driver.findElement(By.xpath("//li[@class= 'user-li']/child::a"))

**Q:What is a Relative XPath? Write its syntax?**

A: Syntax of Relative Xpath :

Syntax1

//html[@attribute = ‘value oftheattribute’]

Syntax2

//html[@attibute1 = ‘value’ and @attribute2 = ‘value’]

SYNTAX 3

//html[@attibute1 = ‘value’ or @attribute2 = ‘value’]

SYNTAX 4

//html[text() = ‘valueofthetext’]           // this kind of xpath only works for link

**Q: How to execute JavaScript in Selenium?**

A: execute\_script method

Ex: driver.execute\_script('alert("Hello, World!");

**Q:What is the concept that makes XPath Expressions powerful ?**

A:-the combination of

 flexible location paths to specify the elements you want to select,

expressions that allow you to traverse the document tree in a flexible and efficient way

powerful functions and operators, predicates to further refine your selection criteria and advanced selection techniques makes XPath expressions a very powerful tool for navigating and selecting elements within XML and HTML documents.

**Q:Why CSS Selectors have higher priority over XPath**

Expressions?

A: CSS Selectors have higher priority over XPath Expressions because of the way that the browser rendering engine processes web page styles and layouts.

**Q:Names of add-ons which can auto generate the XPath Expressions and CSS** Selectors?

A:

* SelectorGadget- Google Chrome and Firefox extensions

-allows you to visually select any element on a web page and generates the corresponding CSS selector or XPath expression.

* Firebug- popular extension for Firefox

-provides a range of web development tools:HTML, CSS editor, JavaScript debugger, network monitor.

- feature for generating XPath expressions and CSS selectors.

* XPath Helper- Chrome extension

- provides a simple interface for generating XPath expressions.

- "Select" button that allows you to click on any element in the web page and generate the corresponding XPath expression.

* ChroPath- Chrome and Firefox

-  easy-to-use interface for generating and editing XPath expressions and CSS selectors

- features for generating relative XPath expressions.

**q:Write a Java program to find the sum of first 100**

numbers using for loop?

A:public class SumOfFirst100Numbers {

public static void main(String[] args) {

int sum = 0;

for (int i = 1; i <= 100; i++) {

sum += i;

}

System.out.println("The sum of the first 100 numbers is: " + sum);

}

}

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**Q:Prints numbers from 1 to 100. Print number and**

Divisible by 5 text if divisible?

A:public class PrintDivisibleBy5 {

public static void main(String[] args) {

for (int i = 1; i <= 100; i++) {

if (i % 5 == 0) {

System.out.println(i + " (Divisible by 5)");

} else {

System.out.println(i);

}

}

}

}

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**Q:Does Java supports multiple inheritance? Give reasons?**

A:Java does not support multiple inheritance of classes Because Multiple inheritance can lead to ambiguity when a class inherits from two or more classes with the same methods or attributes. For example, if Class A and Class B both have a method with the same name, and a class C inherits from both A and B, it may not be clear which implementation of the method should be used in C.

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**Q:What is the parent or base class of all the classes in**

**Java?**

A:In Java, the parent or base class of all classes is the Object class

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**Q:What is the difference between instance variable and**

**local variable?**

A: instance variables are declared within a class and have a longer lifetime, , while local variables are declared within a method, constructor, or block, have a shorter lifetime

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**Q:Is Java a pure 100% Object Oriented Programming**

**language?**

A:Java is not a pure OOP language .

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**Q:What is the difference in between Primitive & Non-**

**Primitive Data types in Java?**

A:Primitive types are predefined (already defined) in Java. Non-primitive types are created by the programmer and is not defined by Java (except for String ).

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**Q:Why Strings are immutable in Java?**

A:Strings in Java are specified as immutable, as seen above because strings with the same content share storage in a single pool to minimize creating a copy of the same value.

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**Q:What is the difference between String and StringBuffer?**

A:The main difference between String and StringBuffer is String is immutable while StringBuffer is mutable

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**Q:Accessing all elements inside int[][] a = {{5,2,9},{4,6,8}};**

**using for loop?**

A: public static void main(String[] args) {

int[][] a = {{5, 2, 9}, {4, 6, 8}};

// Accessing elements using nested for loops

for (int i = 0; i < a.length; i++) {

for (int j = 0; j < a[i].length; j++) {

System.out.println( a[i][j]);

}

}

}

}

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**Q:What is the disadvantage of array?**

A:

An array has a fixed size which means you cannot add/delete elements after creation.

In the case of a large number of records, it may take more space than required for storing the same information.

Deleting an item from an array involves copying every preceding element to fill up the gap left behind by the deleted element. Deleting items from an array is very expensive because of this reason.

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**Q:What is the difference between equals() and ==**

**operator?**

A:The equals() method in Java is used to compare two objects on the basis of their memory locations. == is a Java operator, generally used to compare primitive data types but can also be used to compare objects.

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**Q:What is the purpose of using Wrapper classes in Java?**

A: wrapper classes in Java are used to represent primitive data types as objects, enabling them to be used in object-oriented programming paradigms, collections, generics, reflection, and other scenarios where objects are required.

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**Q:How to capture screen-shot in Selenium WebDriver?**

A:In Selenium WebDriver, you can capture a screenshot of the current web page using the getScreenshotAs() method provided by the TakesScreenshot interface.

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**Q:What is Automation Testing?**

A:Automation testing is the process of using software tools or scripts to automatically execute tests on software applications or systems, without the need for manual intervention.

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**Q:What is the difference between Manual and**

**Automation Testing?**

A:In manual testing, a human performs the tests step by step, without test scripts. In automated testing, tests are executed automatically via test automation frameworks, along with other tools and software.

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**Q:What are primitive data types in Java?**

A: byte , short , int , long , float , double , boolean and char.

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**Q:Can we create an object for an interface?**

A:No, you cannot create an object for an interface in Java. An interface in Java is a collection of abstract methods (methods without implementation) and constants (public static final variables) that can be implemented by classes.

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**Q:Can we create an object for an abstract class?**

A:No, you cannot create an object for an abstract class in Java. An abstract class is a class that cannot be instantiated directly, as it may contain abstract methods or it may be designed to be extended by other classes.

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**Q:Can we write Webdriver driver = new Webdriver();**

A:No, you cannot create an object of the WebDriver interface directly using the new keyword, as WebDriver is an interface in Selenium, and interfaces cannot be instantiated.

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**Q:What is the purpose of using Constructors in Java?**

A:Constructors in Java are special methods that are used to initialize objects of a class. They are called automatically when an object is created using the new keyword and are used to set initial values for the object's member variables or to perform any other setup tasks.

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**Q:How Constructors are different from Methods in Java?**

A: Constructors are used for object initialization and are automatically called during object creation, while methods are used for performing operations on objects and must be explicitly invoked.

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**Q:What is the purpose of using ‘this’ keyword in Java**

A:this keyword in Java is a reference to the current object within a class. The most common use of the this keyword is to eliminate the confusion between class attributes and parameters with the same name

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**Q:What is Overloading in Java?**

A:Overloading in Java refers to the ability to define multiple methods in a class with the same name but with different parameter lists

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**Q:What is the purpose of using Packages in Java?**

A:A package in Java is used to group related classes.

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**Q:Keyword used by Java class to inherit the properties of**

**another Class?**

A:extends

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**Q:How to access the variables and methods of another**

**Class in Java?**

A:

To access a variable from another class in Java, you can use the following steps:

Create Object of Another Class in Main Class.

Extend Another Class in Main Class.

Declare the variable as public or protected . This will allow other classes to access the variable.

Create an instance of the class that contains the variable.

Use the instance to access the variable.

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**Q:What is Overriding in Java?**

A:overriding refers to the process of providing a new implementation for a method in a subclass that has the same signature (name, return type, and parameter types) as a method in its superclass.

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**Q:Is Overriding applicable for Constructors in Java?**

A:No, overriding is not applicable for constructors in Java

**Q:Is Overriding applicable for constructors in Java?**

A:No, overriding is not applicable for constructors in Java because constructors cannot be inherited. However, a subclass can call its parent's constructor using the `super()` keyword to initialize its own state.

**Q:What are the different modifiers in Java?**

A:In Java, there are four access modifiers:

Public

Private

Protected

default

**Q:What is the difference between default and protected**

**access modifiers in Java?**

A:  Both modifiers  "default" and "protected" are used to control the visibility and accessibility of class members (fields, methods, and inner classes) from other classes:

Default Access Modifier- If a class member is not specified with any access modifier, then it is considered as default access modifier. A class member declared with the default modifier is accessible within the same package but not accessible outside the package.

Protected Access Modifier: A class member declared with the protected access modifier is accessible within the same package and from subclasses, even if they are outside the package.

To summarize, default access modifier restricts the access to class members outside the package, while protected access modifier allows access to subclass even if it is outside the package.

**Q:How to select a radio button in Selenium WebDriver?**

A: use click() method ex: radioBtn.click();

**Q:Why do you get NoSuchElementException?**

A:NoSuchElementException is thrown when the WebDriver is not able to locate a web element using the specified locator strategy. This can happens when there is an Incorrect Locator Strategy, Timing Issues,or during Incorrect Frame/Window Switching.

Q:How can we fetch the page source in Selenium?

A: getPageSource() method provided by the WebDriver interface

**Q:How can we fetch the title of the page in Selenium?**

A: getTitle() method

**Q:What is the difference between static and instance variables in Java?**

A:Difference between static and instance variable in Java:

Static variables:

- are declared using the "static" keyword and are shared among all instances of a class.

- They are stored in the class memory area and can be accessed without creating an object of the class.

Instance variables:

- are declared inside a class but outside of any method, and each object of the class has its copy of the variable.

- are stored in the object memory area and are accessed using object references.

**Q:What is the difference between static and non-static methods in Java?**

A: The difference between static and non-static methods in Java:

Static methods:

-are also declared using the "static" keyword and can be called without creating an object of the class.

-are associated with the class rather than any particular object.

Non-static methods:

- also known as instance methods

-are called using an object reference and operate on the state of an object.

**Q:What happens when specifying a “ final” modifier with variables & methods in Java?**

A: When specifying a "final" keyword with variables and methods Final variables cannot be reassigned, and final methods cannot be overridden by subclasses.

-Final classes cannot be extended.

- are used to declare variables, methods, or classes that cannot be changed or overridden.

**Q:What is the difference between abstract classes and interfaces in Java?**

A: Differences between abstract and interfaces in Java are:

**Abstract classes:**

- that cannot be instantiated and are meant to be subclassed.

- they may contain both concrete and abstract methods, and subclasses must implement the abstract methods.

-can have constructors

**Interfaces:**

-are a collection of abstract methods and constants that define a contract for classes to implement. Classes can implement multiple interfaces but can only inherit from one abstract class.

- cannot have constructors

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**Q:What is the keyword used for inheriting the interfaces in Java?**

A: "implements"

**Q:Can Captcha be automated using Selenium?**

A:No

**Q:How to clear the text inside the text box fields using Selenium WebDriver?**

A: clear() method

Ex:

WebElement textBox = driver.findElement(By.id("textbox"));

textBox.clear();

**Q:What is the default timeout of Selenium WebDriver?**

A: 30 seconds

**Q:How can we submit a form in Selenium?**

A: submit() method

Ex:

WebElement form = driver.findElement(By.tagName("form"));

form.submit();

**Q:What is the purpose of getOptions() method?**

A: getOptions() method in Selenium WebDriver is used to retrieve all the options available in a select element. This method returns a list of WebElements, which represent the individual options.

**Q:Write an XPath to find all the hyper-links on a web page?**

A: //a

**Q:What is Select Class in Selenium WebDriver and how to use it?**

A:Select class in Selenium WebDriver is used to work with dropdown menus, which are implemented using the select element in HTML.

- can be used to select and deselect options from a dropdown menu.

Ex:

WebElement dropdown = driver.findElement(By.id("dropdown"));

Select select = new Select(dropdown);

select.selectByVisibleText("Option 1");

**Q:How to handle alerts in Selenium WebDriver?**

A:

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

alert.accept();

**Q:What is click() command in Selenium WebDriver?**

A: click() - use to click on a web element such as a button, link, or checkbox.

WebElement button = driver.findElement(By.id("submit-button"));

button.click();

**Q:What is sendKeys() command in Selenium WebDriver?**

A:sendKeys()-  simulate typing text into a text field or other input element

WebElement textBox = driver.findElement(By.id("text-box"));

textBox.sendKeys("Hello World");

**Q:How to delete cookies in Selenium?**

A:driver.manage().deleteAllCookies();

**Q:How to get the href of a link?**

A:WebElement link = driver.findElement(By.tagName("a"));

String href = link.getAttribute("href");

**Q:How do you click on a menu item in a drop down menu?**

A:

WebElement dropdown = driver.findElement(By.id("dropdown"));

Select select = new Select(dropdown);

select.selectByVisibleText("Option 1");

**Q:How to get typed text from a textbox?**

A:

WebElement textBox = driver.findElement(By.id("text-box"));

String text = textBox.getAttribute("value");

**Q:How to type text in a new line inside a text area?**

A: WebElement textArea = driver.findElement(By.id("text-area"));

textArea.sendKeys("Line 1" + Keys.ENTER + "Line 2");

**Q:How to resize browser window using Selenium WebDriver?**

A: driver.manage().window().setSize(new Dimension(800, 600));

**Q:How to scroll web page up and down using Selenium WebDriver?**

A:Actions actions = new Actions(driver);

actions.keyDown(Keys.CONTROL).sendKeys(Keys.END).perform();

**Q:How to perform right click (Context Click) action in Selenium WebDriver?**

A:WebElement element = driver.findElement(By.id("menu-item"));

Actions actions = new Actions(driver);

actions.contextClick(element).perform();

**Q:How to perform double click action in Selenium WebDriver?**

A:WebElement element = driver.findElement(By.id("double-click-item"));

Actions actions = new Actions(driver);

actions.doubleClick(element).perform();

**Q:How to perform drag and drop action in Selenium WebDriver?**

A: dragAndDrop() method needs two Actions Class arguments which are source and target elements:

WebElement sourceElement = driver.findElement(By.id("source")); //which will be dragged

WebElement targetElement = driver.findElement(By.id("target")); //which will be dropped

Actions actions = new Actions(driver);

actions.dragAndDrop(sourceElement, targetElement).perform();

// perform() method to execute the drag and drop action.