Submission Deadline: 13th Nov, 2023 11:59pm EST

Topic: Interview Questions, Designing Framework as per Acceptance Criteria

Weekday Batch: Date – 4th Oct 2023

Submission Instructions: -

1. **Please submit your theoretical answers in Word or pdf document.**
2. **Please submit your framework design in the form of GitHub link.**
3. **Execution from command prompt – attach screenshots.**
4. **Every theory question has to be answered.**

FRAMEWORK DESIGN: -

Acceptance Criteria

1. **Use the url -http://tutorialsninja.com/demo**
2. **Create MAVEN Project.**
3. **Execution of all Test Cases should be in Chrome Browser**
4. **Login, Register and Search Product needs to be validated.**
5. **Add a valid product and complete the checkout**
6. **TestNG should be used extensively.**
7. **Listeners to be implemented.**
8. **Extent Reports to be used.**
9. **Push the code to GitHub.**
10. **Execute the code in cmd terminal.**
11. **Setup Jenkins and execute code in JENKINS.**

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THEORETICAL QUESTIONS: -

What is Selenium? What are the different components and versions of Selenium?

Selenium is a popular open-source framework for automating web browsers. It provides a way to interact with web pages, perform actions on them, and extract data, making it a valuable tool for web testing and web scraping. Selenium supports multiple programming languages, including Java, Python, C#, and others, and it works with various web browsers like Chrome, Firefox, Safari, and Internet Explorer.

- The four major components of Selenium are Selenium Grid, Selenium RC(remote control), Selenium Web Driver, and Selenium IDE.(integrated development environment).

- versions of Selenium: selenium1, selenium2, selenium3, selenium4 and the latest version of Selenium-Webdriver is 14.4.0 .

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

- Locators in Selenium are the strategies used to locate and identify web elements on a webpage. They are crucial to interact with these elements and extract information from them .There are several types of locators in Selenium:

- ID:(High priority) This locator type is used to locate an element by its unique ID attribute. It's the most efficient way to locate a single element on a page.
- Name:(High priority) This locator type is used to locate an element by its name attribute. It's useful when the ID attribute is not available.
- Class Name: (Medium priority)This locator type is used to locate an element by its class name. It's used when multiple elements share the same class name.
- Tag Name: (Medium priority)This locator type is used to locate an element by its HTML tag name.
- Link Text: (Medium to low priority)This locator type is used to locate a hyperlink by its visible text.
- Partial Link Text:(Medium to low priority) This locator type is used to locate a hyperlink by a part of its visible text.

- CSS Selector: (High priority)This locator type is used to locate an element by CSS selectors. It can locate elements by id, class, name, etc.
- XPath:(High priority) This locator type is used to locate an element using an XPath expression. XPath is a powerful tool to locate elements as it can navigate through the entire HTML DOM tree

What are the different types of drivers in Selenium WebDriver?

1.ChromeDriver: This is the driver for the Google Chrome browser. It is used to control the Chrome browser and perform operations like clicking a button, filling a form, etc., on hrome.
2.FirefoxDriver: This is the driver for the Mozilla Firefox browser. It is used to control the Firefox browser and perform operations like clicking a button, filling a form, etc.,
3.EdgeDriver: This is the driver for the Microsoft Edge browser. It is used to control the Edge browser and perform operations like clicking a button, filling a form, etc.,
4.InternetExplorerDriver: This is the driver for the Microsoft Internet Explorer browser. It is used to control the Internet Explorer browser and perform operations like clicking a button, filling a form, etc., on Internet Explorer
5.SafariDriver: This is the driver for the Apple Safari browser. It is used to control the Safari browser and perform operations like clicking a button, filling a form, etc., .

How do I launch the browser using WebDriver?

-You need to specify the WebDriver you want to use (e.g., ChromeDriver, FirefoxDriver, etc.), and in the case of Java, you should set the path to the WebDriver executable.
-Initialize an instance of the WebDriver.
-Use the get()method to open a specific URL in the browser.
-Perform your desired automation tasks, such as interacting with web elements, clicking buttons, filling forms, etc., between the get() and quit() methods.
- Finally, use the quit()method to close the browser when your automation tasks are complete.

What are the different types of navigation commands in WebDriver?

- Selenium WebDriver provides a set of navigation commands that allow you to control the browser's navigation. These commands provide an efficient way to manage a browser's history and perform actions like going back and forward between pages and refreshing the current page. The navigation command provides four methods: to()command,back() command ,forward() command, refresh() command.

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

In Selenium, you can find out whether an element is displayed on the screen using the isDisplayed() method. This method checks if a web element is present on the screen and returns a boolean value: true if the element is displayed, and false if it is not.

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

- In Selenium WebDriver, you can retrieve the text of a web element using the getText() method. This method returns the inner text of the web element

How to type into a text box using Selenium?

- To type into a text box using Selenium, you will need to first locate the text box element on the webpage. This can be done using various locating strategies such as By.id, By.name, By.className, By.xpath, etc. Once you have located the text box element, you can use the sendkeys method to type into it.

How to handle a drop-down field and select a value from it using Selenium?

-To handle a drop-down field and select a value from it using Selenium, you can use the Select class provided by Selenium. The Select class provides methods to select and deselect options in a drop-down list.

What are the different types of waits available in WebDriver?

a - Implicit Wait: This type of wait tells WebDriver to poll the DOM for a certain amount of time when trying to find an element or elements that are not immediately available. The default setting is zero.

b - Explicit Wait: This type of wait tells WebDriver to wait for a certain condition to occur before proceeding with the execution. The condition could be an element becoming available, an element becoming visible, an element becoming clickable, etc.

c - Fluent Wait: This type of wait is a variation of the explicit wait, but it allows you to set a maximum timeout and a polling interval. It also allows you to ignore specific exceptions.

What is the latest Selenium tool?

- The latest version of Selenium is Selenium 4.15.0-SNAPSHOT, which was released on October 24, 2023

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

Selenium 1: Also known as Selenium Remote Control (RC), Selenium1 was the first automated web testing tool that allowed users to use a programming language they preferred
Selenium 2: Selenium 2 is the integration of WebDriver with Selenium RC (Selenium 1). WebDriver works directly with the browser and uses the browser's built-in features to trigger the automation test.
Selenium 3: Selenium 3 is a drop-in replacement for WebDriver API's. The major change in Selenium 3 is the removal of the core and replacement with the back-end WebDriver. Selenium 3 has become a W3C (World Wide Web Consortium) standard and is a choice of a software testing tool for both web and mobile-based applications

When should I use Selenium Grid?

A- Run your tests against different browsers, operating systems, and machines all at the same time: This will ensure that the application you are testing is fully compatible with a wide range of browser-OS combinations
B- Run your tests against different browsers, operating systems, and machines all at the same time: This will ensure that the application you are testing is fully compatible with a wide range of browser-OS combinations
C- Distribute your test cases for execution: Selenium Grid gives the flexibility to distribute your test cases for execution. The Hub is the central point to the entire GRID Architecture which receives all requests. There is only one hub in the selenium grid. Hub distributes the test cases across each node.
D- Parallel execution to expedite the cross-browser testing process: Selenium Grid lets you perform test case execution on different combinations of browsers, operating

systems (or platforms), and machines. It also enables you to perform parallel execution to expedite the cross-browser testing process.

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

- Single Forward Slash (/): The single forward slash is used to define an absolute path from the root node of the document. Each forward slash represents a level of the document hierarchy.

- Double Forward Slash (//): The double forward slash is used to define a relative path from the current node (or from the root node if no context is specified).
- In summary, / is used for selecting immediate child elements, while // is used for selecting elements at any level of the hierarchy. The choice of whether to use / or // depends on your specific requirements for element selection within the document structure.

What is an XPath?

- XPathIt's a powerful tool for extracting and manipulating data from structured documents. In selenium is used for navigation through the HTML structure of the page. It is a syntax or language for finding any element on a webpage using XML path expression. XPath can be used for both HTML and XML documents to find the location of any element on a webpage using HTML DOM structure.

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

driver.close(): The driver.close()command is used to close the current browser window that is in focus. If there are multiple browser windows or tabs open within the same WebDriver session, driver.close() will only close the current window or tab, leaving the rest open. If only one window or tab is open, calling driver.close() will end the WebDriver session.
driver.quit(): The driver.quit()command is used to end the entire WebDriver session, which includes closing all browser windows, tabs, and pop-ups associated with that session. It also releases the resources and memory associated with the session. Generally,driver.quit() is one of the last statements in your automation scripts, often used in teardown methods to ensure that the browser and associated resources are properly closed after the test suite has run

Is WebDriver a class or interface?

- WebDriver in Selenium is an interface, not a class. The WebDriver interface is the main interface in Selenium, and it defines a set of methods for controlling a web browser.

What is the super interface of WebDriver?

- The super interface of WebDriver in Selenium is SearchContext. The SearchContext interface is the top-most interface in the WebDriver hierarchy and contains two abstract methods: findElement() and findElements(). These methods are used to locate elements within the context of the search
- In summary, SearchContext is the super interface of WebDriver.
The SearchContext interface provides the basic functionality for finding elements, and the WebDriver interface extends this functionality to provide a full set of controls for interacting with a browser

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

- In Selenium WebDriver, you can find more than one web element and store them in a list using the findElements() method. This method returns a list of all web elements that match the specified locator strategy and locator value.

Is FirefoxDriver a class or interface?

- FirefoxDriver is a class, not an interface. It is a concrete implementation of the WebDriver interface provided by Selenium WebDriver.
- The FirefoxDriver class is used to interact with the Mozilla Firefox web browser for automated testing.

Explain the line of code WebDriver driver = new FirefoxDriver();?

- WebDriver driver: This declares a variable named 'driver' of type WebDriver. This means that we can assign any object to this variable as long as it is an instance of a class that iplements the WebDriver interface.

- New FirefoxDriver(): This creates a new instance of the FirefoxDriver class. The FirefoxDriver class is a concrete implementation of the WebDriver interface. It provides the actual functionality for controlling and manipulating the Firefox browser.

- WebDriver driver=New FirefoxDriver(); : This line of code combines the two parts above. It creates a new FirefoxDriver object and assigns it to the 'driver' variable. This means that we can now use the 'driver' variable to call any method defined in the WebDriver interface on the Firefox browser.

How to click on hyper-link using selenium webdriver ?

```
import org.openqa.selenium.By;
import org.openqa.selenium.WebDriver;
import org.openqa.selenium.WebElement;
import org.openqa.selenium.chrome.ChromeDriver;

public class ClickHyperlinkExample {

    public static void main(String[] args) {
        // Set the path to the chromedriver executable (download it
from https://sites.google.com/chromium.org/driver/)
        System.setProperty("webdriver.chrome.driver",
"path/to/chromedriver");
        // Create a new instance of the Chrome driver
        WebDriver driver = new ChromeDriver();
        // Open a web page
        driver.get("https://example.com");
        // Locate the hyperlink element by its link text
        WebElement link = driver.findElement(By.linkText("Your Link
Text Here"));
        // Click on the hyperlink
        link.click();
        // Close the browser window
        driver.quit();
  }
```

What are the programming languages supported by selenium webdriver?

Selenium WebDriver supports several programming languages, allowing developers to write tests in their preferred language. As of my last knowledge update in January 2022, the following programming languages are officially supported by Selenium WebDriver:

1. ****Java****: Selenium WebDriver has excellent support for Java and is one of the most commonly used languages with Selenium.

2. ****Python****: Selenium WebDriver supports Python, making it easy for Python developers to automate web testing.

3. ****C# (C-Sharp)**:** Selenium has support for C#, enabling developers who use .NET languages to work with Selenium.

4. ****Ruby**:** Selenium WebDriver has support for Ruby, allowing Ruby developers to write test scripts for web applications.

5. ****JavaScript (Node.js)**:** While Selenium is traditionally associated with Java, Python, C#, and Ruby, there is also support for JavaScript when using Node.js. This is often referred to as "WebDriverJS."

6. ****Kotlin**:** Kotlin is interoperable with Java, so you can use Kotlin with Selenium WebDriver if you prefer Kotlin over Java.

7. ****Groovy**:** Groovy is another language that is compatible with Java, and Selenium WebDriver can be used with Groovy as well.

What are the operating systems supported by Selenium webDriver?

Selenium WebDriver is a tool for automating web applications and supports multiple operating systems. The WebDriver APIs are available for various programming languages, and the compatibility with different operating systems depends on the WebDriver implementation for that specific language. Here are the operating systems generally supported by Selenium WebDriver:

1. **Windows:** Selenium WebDriver is compatible with Windows operating systems, including Windows 7, 8, and 10.

2. **Linux:** Selenium WebDriver supports various Linux distributions. It can be used on systems running popular distributions like Ubuntu, CentOS, Debian, and others.

3. **macOS:** Selenium WebDriver is compatible with macOS, making it suitable for automation on Apple's Mac computers.

4. **Mobile Operating Systems:** Selenium WebDriver also supports mobile operating systems such as Android and iOS for mobile application testing. For Android, you can use the ChromeDriver for web testing, and for iOS, you can use the Appium framework.

What are the browsers supported by Selenium WebDriver?

- Google Chrome: Selenium provides ChromeDriver to automate Google Chrome browser.
- Mozilla Firefox: Selenium provides FirefoxDriver to automate the Mozilla Firefox browser.

- Microsoft Edge: Selenium supports EdgeDriver to automate Microsoft Edge, both the legacy version (EdgeHTML) and the Chromium-based version.
- Internet Explorer: Selenium supports InternetExplorerDriver for automating Internet Explorer browsers. However, please note that support for Internet Explorer has been gradually phased out by both Selenium and Microsoft.
- Safari: For Safari browser automation on macOS, you can use the SafariDriver, but this may require additional configuration and settings on your system.
- Opera: Selenium also supports the Opera browser using OperaDriver.
- Headless Browsers: Selenium supports headless versions of browsers like Chrome and Firefox, which run without a graphical user interface, making them useful for automated testing and scraping tasks.
- Mobile Browsers: Selenium can be used for automating mobile web browsers on Android and iOS devices. For Android, you can use AndroidDriver, and for iOS, you can use the XCUITestDriver.

What is the difference between Implicit Wait and Explicit Wait?

Implicit Wait:

- Implicit wait sets a default timeout for the entire test runtime. This means that once you set the implicit wait, it will be applicable to all the elements in the script
- It waits for an element to appear on the page. If the element is not located on the web page within the specified time frame, it will throw a NoSuchElementException
- Implicit wait applies globally, meaning it is set for the lifetime of WebDriver and is applicable for each element

Explicit Wait:

- Explicit wait sets timeouts for specific conditions. It waits for a specific condition, such as the presence of an element or the element to be clickable .
- It applies locally to a specific element. You need to specify "ExpectedConditions" on the element to be located .
- Explicit wait throws a TimeoutException when the element doesn’t meet the condition within the specified timeout

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

- Identify the tooltip element: The first step is to identify the element that triggers the tooltip. This can be done using any of the locating strategies provided by Selenium, such as By.id(), By.name(),By.className(), By.xpath()etc
- Trigger the tooltip: Depending on how the tooltip is implemented, you may need to simulate a mouse hover over the element to trigger the tooltip. This can be done using the Acyions class in Selenium.
- Read the tooltip text: Once the tooltip is triggered, you can read the tooltip text. If the tooltip text is stored in the title attribute of the HTML element, you can use the getAttribute("title") method to retrieve it.
- Verify the tooltip text: Finally, you can verify that the tooltip text is as expected. This can be done using an assertion.

Can Selenium Automate Desktop Applications?

- Selenium is primarily designed for automating web applications and cannot be used directly to automate desktop applications. Selenium WebDriver interacts with web elements within a web browser and provides a framework for automating tasks related to web testing and web automation.
- For automating desktop applications, you would need a different set of tools and frameworks, such as:
- Appium, WinAppDriver (Windows Application Driver), AutoIt, Java Robot Class,UI Automation Framework (for Windows).

What is the main component of Selenium?

- Selenium WebDriver: This is the core component of Selenium. It provides a programming interface to control web browsers, allowing you to simulate user interactions like clicking buttons, entering text, and navigating between pages. WebDriver accepts commands and sends them to a browser via a browser-specific driver, which then executes the commands and retrieves the results
- Selenium IDE: Selenium IDE (Integrated Development Environment) is a Firefox and Chrome extension that allows for recording, editing, and debugging of functional tests. Scripts can be automatically recorded and edited manually, providing autocompletion support and the ability to move commands around quickly. Scripts are recorded in Selenese, a special test scripting language for Selenium
- Selenium Grid: Selenium Grid is a component that allows for parallel testing against various browser and operating system combinations. It works on a client-server model where the server is known as the hub, which can interact with multiple remote machines.

This enables running a browser automation script over multiple browser + OS configurations simultaneously
- Selenium Client Libraries: These libraries act as an interpreter between your test script and Selenium. They translate a test script written in any programming language to Selenese through language bindings. This allows Selenium to follow your given instruction irrespective of what language you choose to write your Selenium test scripts

What is an XPath, difference between Absolute and Relative XPath with examples?

XPath stands for XML Path Language. It's an expression language that is used to query or transform. We use it to traverse among elements and attributes in an XML document. In the context of web scraping and automation testing with Selenium, XPath is used to locate elements in the HTML structure of a web page.

There are two types of XPath: Absolute XPath and Relative XPath.

- Absolute XPath: This is the complete path from the root element to the desired element. It starts with a single forward slash (/) which means you can select the element from the root node. An example of an absolute XPath expression is /html/body/div[1]/div/div[1]/a. However, the disadvantage of absolute XPath is that if there is any change in the path of the element, the XPath becomes invalid.
- Relative XPath: This starts from the middle of the HTML DOM structure, not from the root node. It starts with double forward slash (//). It can search elements anywhere on the webpage. Relative XPath is preferred as it is not a complete path from the root element and is not impacted if an element is removed or added in the DOM. An example of a relative XPath expression is //a[@title='TutorialsPoint - Home']
- In summary, while absolute XPath provides the complete path to an element, it is prone to changes in the DOM structure, making it less reliable. On the other hand, relative XPath is more flexible and robust as it is not dependent on the complete path from the root element. It is always preferred for automation scripts
What is the disadvantage of Absolute XPath & why is Relative XPath recommended?

- The main disadvantage of Absolute XPath

is its lack of flexibility and resilience to changes in the document structure. Here are some reasons why Absolute XPath is often not recommended:

- Brittleness: Absolute XPaths specify the exact path from the root of the document to an element. If any element in that path changes or if the structure of the document is modified, the XPath becomes invalid, and you will need to update it. This makes automation scripts using Absolute XPaths fragile and likely to break frequently.

- Maintenance: Maintaining scripts that use Absolute XPaths can be time-consuming and error-prone. Even minor changes to the document structure can require extensive updates to XPath expressions.

- Readability: Absolute XPaths tend to be long and complex, which makes the code less readable and harder to understand.

- Performance: Constructing Absolute XPaths can be more time-consuming because they often involve specifying the entire path from the root. Relative XPaths, on the other hand, only need to specify the path relative to a known element, which is generally faster to construct.

- Relative XPaths are recommended for several reasons:

- Flexibility: Relative XPaths specify the location of an element relative to another element in the document. This makes them more resilient to changes in the document structure because as long as the relationship between elements remains the same, the XPath remains valid.

- Robustness: Relative XPaths are less likely to break when the page structure evolves. If a new element is added or an existing one is modified, as long as the relationship to the target element remains intact, the Relative XPath should still locate the desired element.

- Conciseness: Relative XPaths are typically shorter and more concise, which makes the code more readable and easier to maintain.

- Ease of Use: When using automation tools like Selenium, locating elements with Relative XPaths is often more intuitive and user-friendly.

- In summary, Relative XPaths are recommended because they are more adaptable and less prone to breakage as web pages evolve. They offer a more sustainable approach to locating elements when working with web automation and web scraping.

What is an Absolute XPath? Write its syntax?

- An Absolute XPath is a specific XPath expression that specifies the exact location of an element within an XML or HTML document, starting from the root of the document. It provides an absolute path to the target element, irrespective of its position within the document's structure. Here is the syntax for an Absolute XPath:

/html

/html/body
/html/body/div[1]
/html/body/div[1]/element_name[index]
/html/body/div[1]/element_name[index]/sub_element_name[index]

What is a Relative XPath? Write its syntax?

Relative XPath is a way of finding elements based on their relationship to other elements in the XML document. It is often used when you want to locate an element with respect to another element.
The syntax for a relative XPath expression typically involves specifying the path from the current node to the desired node. Here's a basic outline of the syntax:

```
<current_node>/<child_or_descendant>::<element_predicate>
```

How to execute JavaScript in Selenium?

To execute JavaScript in Selenium, you can use the JavascriptExecutor interface. This interface provides two methods: executeScript and executeAsyncScript, which allow you to run JavaScript on the selected window or current page
Here is a step-by-step process on how to use JavascriptExecutor in Selenium:
1-Import the JavascriptExecutor interface: import org.openqa.selenium.JavascriptExecutor;
2-Create an instance of JavascriptExecutor:JavascriptExecutor js = (JavascriptExecutor) driver;
3-Use the executeScript method to run your JavaScript code:js.executeScript(script, args);

What is the concept that makes XPath Expressions powerful ?

XPath (XML Path Language) is a powerful tool for navigating through and selecting nodes in XML documents. Its power lies
in several key concepts and features:
- Path Expressions: XPath uses path expressions to select nodes or node-sets in an XML document. These path expressions are similar to the path expressions you use with traditional computer file systems. For example, //bookstore/book/title selects the title element of every book in the bookstore.
- Predicates: Predicates, written as expressions in square brackets, can be used to filter a node-set according to some condition. For example, a[@href='help.php'] keeps only those elements having an href attribute with the value help.php Axes: Axes describe the relationships between nodes and allow for more complex navigation through the XML document. For example, the following-sibling axis can be used to select all siblings that come after a certain node.

- Functions: XPath includes a variety of functions for string values, numeric values, booleans, date and time comparison, node manipulation, sequence manipulation, and much more.
- Flexibility: XPath can be used in many programming languages such as JavaScript, Java, XML Schema, PHP, Python, C and C++, and lots of other languages.
- Handling of Missing Nodes: XPath can handle situations where a node is not present in the XML. Instead of causing the flow to fail, XPath will just show a blank record for the node without an author.
- Standardization: XPath was defined by the World Wide Web Consortium (W3C) in 1999, ensuring a high level of standardization and compatibility across different platforms

Why CSS Selectors have higher priority over XPath Expressions?

CSS Selectors have a higher priority over XPath expressions due to several reasons:
- Performance: CSS selectors are faster compared to XPath. This is because CSS selectors are unidirectional and can search for elements in the Document Object Model (DOM) tree more quickly.
- Simplicity: CSS selectors are generally simpler and more straightforward than XPath expressions. They are tied to a single HTML element, making them more reliable. For example, selecting elements by class name in CSS is as simple as .my-class, while the equivalent XPath would be //div[@class='my-class'] .
- Browser Rendering: When a browser renders a web page, it first applies the styles defined in the CSS stylesheets to the elements in the DOM tree. If conflicting styles are defined for the same element in both CSS and XPath, the browser will prioritize the CSS styles. This is because the browser applies CSS styles first and then applies XPath expressions to select elements.
- ID Selectors: The ID selectors in CSS are most preferred over any other selectors because ID is associated with a single HTML element, and is unique. This makes it a reliable choice for selecting elements.
- However, it's important to note that not all XPath expressions can be replaced by CSS selectors, as they have different syntax and capabilities. XPath provides more flexibility and capabilities for complex queries involving multiple axes, which CSS selectors cannot do. Therefore, the choice between CSS selectors and XPath expressions depends on the specific requirements of the task at hand.

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

- There are several browser extensions that can auto-generate XPath expressions and CSS selectors:
- ChroPath (Chrome and Firefox): ChroPath is a browser extension available for both Google Chrome and Mozilla Firefox. It provides a user-friendly interface for generating XPath and CSS selectors. It allows you to interact with elements on a web page and automatically generates the corresponding selectors
- SelectorGadget (Chrome Extension): SelectorGadget is a Chrome extension that simplifies the process of generating CSS selectors. It provides a point-and-click interface that highlights the elements you want to select, and it generates the appropriate CSS selectors for you.
- Firebug (Firefox): While Firebug itself is not an extension, it's a web development tool that is available as an add-on for Firefox. Firebug has a feature that allows you to inspect elements on a page and generate both XPath and CSS selectors for the selected elements.
- Selenium IDE (Chrome and Firefox): Selenium IDE is a browser extension that provides a complete environment for recording, editing, and executing automated tests in Selenium. It also includes features for generating and validating XPath and CSS selectors.
- Web Scraper (Chrome Extension): Web Scraper is a Chrome extension that is primarily designed for web scraping tasks. It offers a point-and-click interface for selecting elements and generates both XPath and CSS selectors for data extraction.
- These tools can significantly simplify the process of generating XPath expressions and CSS selectors, making it easier to interact with and scrape data from websites when using tools like Selenium or for web scraping in general. Choose the one that best fits your needs and your browser of choice.

Java program for printing the even numbers between 1 and 100 using for loop?

```
public class EvenNumbers {
    public static void main(String[] args) {
        // Using a for loop to iterate through numbers from
1 to 100
        for (int i = 1; i <= 100; i++) {
            // Checking if the current number is even
            if (i % 2 == 0) {
                // Printing the even number
                System.out.print(i + " ");
            }
        }
    }
```
Write a Java program to find the sum of first 100 numbers using for loop?
```
package com.bootcamp.part2;
publicclass SumOfFirst100Numbers {
publicstaticvoid main(String[] args) {
intsum = 0;
for (inti = 1; i<= 100; i++) {
sum += i;
}
System.out.println("The sum of the first 100 numbers is: " +
sum);
}
}
```
Prints numbers from 1 to 100. Print number and Divisible by 5 text if divisible?
```
package com.bootcamp.part2;
publicclassNumbersDivisibleBy5 {
publicstaticvoid main(String[] args) {
for (inti = 1; i<= 100; i++) {
System.out.print(i);
if (i % 5 == 0) {
System.out.print(" (Divisible by 5)");
}
System.out.println(); // Move to the next line for the next
number
}
}
}
```
Does Java supports multiple inheritance? Give reasons?
- Java does not support multiple inheritance for classes, which means a class cannot extend more than one class to avoid ambiguity, issues like the diamond problem and to maintain a simpler and more predictable language. Instead, it provides a mechanism for multiple inheritance of behavior through interfaces.

What is the parent or base class of all the classes in Java?
- The parent or base class of all the classes in Java is the Object class. This class is part of the java.lang package and is the root of the class hierarchy in Java. Every class in Java either directly or indirectly inherits from the Object class.

-The Object class provides some common behaviors to all the objects such as object can be compared, object can be cloned, object can be notified etc. This means that all objects in Java have methods like equals(), hashCode(), getClass(), toString(), notify(), notifyAll(), and wait() that they can use.

What is the difference between instance variable and local variable?

- Instance variables are declared within a class but outside a method, constructor, or block. They are created when an object is created with the use of the new keyword and destroyed when the object is destroyed. Each object has its copy of the instance variable, so if you change the value of the instance variable in one object, it does not affect the value in another object.

- Local variables are declared within a method, constructor, or block. They are created when the method, constructor, or block is entered and destroyed when the method, constructor, or block is exited. Unlike instance variables, local variables are not accessible outside the method, constructor, or block in which they are declared

- Scope: Instance variables are accessible throughout the class in which they are declared, while local variables are only accessible within the method, constructor, or block in which they are declared.

- Lifetime: Instance variables exist as long as the object they are associated with exists. Local variables exist only for the duration of the method, constructor, or block in which they are declared.

- Memory: Instance variables are stored in the heap memory. Local variables are stored in the stack memory.

- In conclusion, the choice between using an instance variable or a local variable depends on the specific requirements of your program. Instance variables are used when you need to associate a value with an object, and this value needs to be accessed by multiple methods within the class. Local variables are used for temporary storage within a specific method, constructor, or block.

Is Java a pure 100% Object Oriented Programming language?

- Java is not a purely Object-Oriented Programming (OOP) language. While it does support many OOP concepts such as encapsulation, inheritance, and polymorphism, it also includes features that are not part of OOP. These include primitive data types and the use of the static keyword.

- Java supports primitive data types such as int, char, float, bool, etc. These are not objects and do not have methods or properties.

- Java also includes the static keyword, which allows a member (method or variable) to be accessed without creating an instance of the class, if a method or variable is declared as static, it can be accessed directly from the class, bypassing the need for an object.

- Java provides wrapper classes (like Integer, Float, etc.) to use primitive data types as objects and vice versa. However, even with the use of wrapper classes, Java is not 100% OOP because it still uses the operations where primitive types are converted automatically into objects (or vice versa) by the Java compiler, a process known as Autoboxing and Unboxing.

- java allows the use of the final keyword to prevent inheritance or method overriding, which is not purely aligned with the idea of open and extensible OOP.

What is the difference in between Primitive & Non-Primitive Data types in Java?

- Definition: Primitive data types are predefined in Java, while non-primitive data types are created by the programmer.

- Methods: Primitive data types cannot have methods, while non-primitive data types can.

- Nullability: Primitive data types cannot be null, while non-primitive data types can.

- Size: The size of a primitive data type depends on the data type itself, while non-primitive data types have all the same size.

- Primitive data types are the most basic data types. They include:

byte: An 8-bit signed two's complement integer

short: A 16-bit signed two's complement integer

int: A 32-bit signed two's complement integer

long: A 64-bit signed two's complement integer

float: A single-precision 32-bit IEEE 754 floating point

double: A double-precision 64-bit IEEE 754 floating point

boolean: Either true or false

char: A single 16-bit Unicode character

- Primitive data types are predefined in Java and are used to store simple values like numbers and characters. They do not have methods, and they cannot be null

- Non-primitive data types, also known as reference types, include:

Classes: User-defined types that can hold data and methods

Interfaces: User-defined types that can hold method signatures

Arrays: Collections of elements of the same type

Strings: Collections of characters

Non-primitive data types are not predefined in Java and are created by the programmer. They can have methods and can be null

Why Strings are immutable in Java?

Immutable Strings contribute to thread safety. Since multiple threads can read the same String simultaneously without worrying about modifications, it simplifies multi-threaded programming. This is especially important in multi-threaded applications where shared data access needs to be controlled carefully.

4. Caching and Performance

Java's String class maintains a String pool that stores String literals that have been assigned to variables. When a new String is created, Java first checks the String pool to see if a String with the same value already exists. If it does, Java uses the existing String instead of creating a new one. This process of reusing existing Strings instead of creating new ones is known as String interning. The immutability of Strings makes String interning possible and efficient

- In conclusion, immutability of strings in Java provides benefits in terms of security, thread safety, caching, hashing, predictable behavior, and optimization. It is a fundamental design choice in Java that promotes robust and efficient programming practices.

What is the difference between String and StringBuffer?

- A String in Java is an object that represents a sequence of characters. It is immutable, meaning that once a String object is created, it cannot be changed. Any operation that appears to modify a String actually creates a new String object.

StringBuffer is a mutable sequence of characters. Unlike String, a StringBuffer object can be modified after it is created. StringBuffer is thread-safe, meaning that it can be safely used in a multithreaded environment.

- Differences

Mutability: String is immutable, while StringBuffer is mutable.

Thread Safety: StringBuffer is thread-safe, while String is not.

Performance: String is faster for concatenation of a small number of Strings. StringBuffer is more efficient for concatenation of a large number of Strings or in a loop.

- If you need to modify a sequence of characters, or if you need to use StringBuffer in a multithreaded environment, use StringBuffer. Otherwise, use String.

Accessing all elements inside int[][] a = {{5,2,9},{4,6,8}}; using for loop?

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

for (int i = 0; i < a.length; i++) {
    for (int j = 0; j < a[i].length; j++) {
        int element = a[i][j];
        System.out.println("Element at row " + i + " and column " + j + " is: " + element);
    }
}
```

Assign different values say integer, character, string etc into a single array?

```
public class Main {
   public static void main(String[] args) {
      Object[] mixedArray = new Object[5];

      mixedArray[0] = 36;              // Integer
      mixedArray[1] = 'B';             // Character
      mixedArray[2] = "Hello, World";   // String
      mixedArray[3] = 3.14159;          // Double
      mixedArray[4] = true;            // Boolean

      for (int i = 0; i < mixedArray.length; i++) {
         System.out.println(mixedArray[i]);
      }
   }
}
```

What is the disadvantage of array?

1.Fixed Size

The most significant disadvantage of arrays is that their size is fixed at the time of creation. Once an array is created, the size of the array cannot be changed. If you need to add or remove elements, you have to create a new array with the desired size, which could be inefficient in terms of memory and performance.

2. Homogeneous

Arrays are homogeneous, meaning they can only store elements of the same type. For example, an array cannot simultaneously store integers and strings. This can be limiting when you need to store different types of data in a single data structure

3. Inefficient Memory Usage

If an array is created with a large size, but only a few elements are stored, it can lead to inefficient memory usage. This is because the memory for the entire array is allocated at once, regardless of the number of elements actually stored

4. No Built-in Methods

Arrays in Java do not have built-in methods for manipulating data, unlike ArrayList or Vector classes. For example, to sort an array, you would need to use a separate sorting algorithm or method from the Arrays utility class.

What is the difference between equals() and == operator?

- The == operator compares the references of two objects, not their contents. It checks whether the two object references being compared point to the same object in memory. If the references are the same, the == operator returns true;

otherwise, it returns false. This is often referred to as reference equality or address comparison.

- The equals() method, on the other hand, compares the contents of two objects. It checks whether two objects are meaningfully equivalent, regardless of whether they share the same memory location. The default implementation of equals() in the Object class compares the object references, similar to the == operator. However, many classes override the equals() method to compare the actual content of the objects, such as String, Integer, or any custom class that you create.

- In conclusion, == checks if two references point to the same object (reference equality), while equals() checks if two objects have the same content (value equality or content comparison).

What is the purpose of using Wrapper classes in Java?

1. Convert Primitive Types to Objects

The primary purpose of wrapper classes is to convert primitive data types into corresponding object types. This is necessary when you need to use primitive types in contexts where only objects are allowed, such as in collections or when using methods that require objects geeksforgeeks.org, w3schools.com.

2. Use Object Methods

Wrapper classes allow you to use object methods with primitive types. For example, you can call methods like equals(), toString(), compareTo(), etc., on wrapper objects.

3.Enable Autoboxing and Unboxing

Since Java 5, autoboxing and unboxing are supported, which automatically convert primitive types to their corresponding wrapper objects and vice versa. This simplifies the process of working with primitive types as objects wrapper objects and vice versa. This simplifies the process of working with primitive types as objects.

4. Support for Serialization

Wrapper classes are needed for serialization, which requires objects. If you want to serialize a primitive value, it must first be converted into an object using a wrapper class.

5. Multi-threading and Synchronization

Wrapper classes are needed to support synchronization in multi-threading. Since synchronization in Java requires objects, primitive types cannot be used for synchronization.

In conclusion, wrapper classes in Java provide a way to use primitive types as objects, allowing you to use object methods with primitive types, enabling autoboxing and unboxing, supporting serialization, and enabling synchronization in multi-threading.

How to capture screen-shot in Selenium WebDriver?

- To capture a screenshot in Selenium WebDriver, you can use the TakesScreenshot interface provided by Selenium. This interface has a method getScreenshotAs(OutputType.FILE) that captures the screenshot and stores it in a file.

1.You need to set the system property for the WebDriver executable (e.g., ChromeDriver).
2.Initialize the WebDriver (in this case, a ChromeDriver).
3.Navigate to a webpage.
4.Use TakesScreenshot to capture the screenshot and save it as a File object.
5.Specify the destination path where you want to save the screenshot.
6.Use FileHandler.copy to copy the screenshot file to the specified destination.

- Make sure to replace "path/to/chromedriver" and "path/to/save/screenshot.png" with the actual paths on your system.

What is Automation Testing?

Automation Testing is a methodology where software tools are used to execute test cases and validate the software. The purpose of automation testing is to perform repetitive tasks, reducing the time and effort required for testing tasks. It involves using automated tools to execute test cases and validate the software.

There are several types of automation testing:

1. Unit Testing: This is the process of testing individual units of source code to ensure that they work as expected.
2. Integration Testing: This is the process of testing a combination of units of source code to ensure that they work together as expected.
3. System Testing: This is the process of testing a complete and fully integrated software system to evaluate the system's compliance with the specified requirements.
4. Regression Testing: This is the process of re-running functional and non-functional tests after a change has been made to the software.
5. Performance Testing: This is the process of testing the software under load to ensure it can handle the expected user load and deliver the required performance.

Automation testing can be beneficial in several ways:

1. Efficiency: Automated tests can be run multiple times with minimal human intervention, making the testing process more efficient.
2. Consistency: Automated tests are consistent and repeatable, reducing the chance of human error.
3. Coverage: Automated tests can cover a wide range of scenarios and edge cases that might be missed by manual testing.
4. Speed: Automated tests can be run much faster than manual tests, making it possible to perform extensive testing in a short amount of time.

5. Scalability: Automation testing is scalable and can be used to test applications of any size and complexity

However, it's important to note that while automation testing can provide many benefits, it's not a silver bullet. Automated testing does not replace manual testing and should be used in conjunction with manual testing to achieve the most comprehensive testing coverage techtarget.com.

What is the difference between Manual and Automation Testing?

-In manual testing, testers manually execute test cases and validate the software application against specified requirements.This approach allows for exploratory testing, where testers can employ their domain knowledge and intuition to uncover defects and evaluate the user experience. Methods for performing manual testing include functional testing, UI testing, usability testing, exploratory testing, ad hoc testing, and regression testing

What are primitive data types in java ?

l- In Java, primitive data types are the most basic data types available within the anguage. They are predefined by the Java language and named by reserved keywords. There are eight primitive data types in Java:

1-byte: The byte data type is an 8-bit signed two's complement integer. It has a minimum value of -128 and a maximum value of 127 (inclusive)

2-short: The short data type is a 16-bit signed two's complement integer. It has a minimum value of -32,768 and a maximum value of 32,767 (inclusive).

3-int: The int data type is a 32-bit signed two's complement integer. It has a minimum value of -2,147,483,648 and a maximum value of 2,147,483,647 (inclusive).

4-long: The long data type is a 64-bit signed two's complement integer. It has a minimum value of -9,223,372,036,854,775,808 and a maximum value of 9,223,372,036,854,775,807 (inclusive).

5-float: The float data type is a single-precision 32-bit IEEE 754 floating point. It can represent a wide range of values, from approximately 1.4E-45 to 3.4028235E38, with a precision of 6-7 decimal digits

6-double: The double data type is a double-precision 64-bit IEEE 754 floating point. It can represent a wide range of values, from approximately 4.9E-324 to 1.8E308, with a precision of 15 decimal digits.

7-boolean: This data type represents a true or false value. It is used for logical operations and can only take two values: true or false.

8-char: The char data type is a single 16-bit Unicode character. It has a minimum value of '\u0000' (or 0) and a maximum value of '\uffff' (or 65,535 inclusive)and has a wider range than int.

- These primitive data types are efficient in terms of memory usage and performance because they directly represent values in a form that the computer's hardware can manipulate. They are used for a wide range of purposes, from storing simple integers and characters to making decisions with booleans or representing real numbers with floating-point types. Additionally, Java provides wrapper classes (e.g., Integer, Double, Boolean) to work with these primitive data types as objects when necessary.

Can we create an object for an interface?

- In Java, you cannot directly create an object of an interface. An interface in Java is a reference type, similar to a class, that can contain only constants, method signatures, default methods, static methods, and nested types.
- However, you can create a reference of an interface type. To use an interface, a class must implement it using the implements keyword. After a class implements an interface, you can create an object of that class. The object will then be able to access the methods defined in the interface.

Can we create an object for an abstract class?

-In Java, an abstract class is a class that is declared with the abstract keyword. It can have both abstract methods (methods without a body) and non-abstract methods (regular methods with a body).
- However, unlike regular classes, you cannot directly create an object of an abstract class. This is because an abstract class cannot be instantiated, meaning you cannot create an instance of an abstract class using the new keyword
- You can create objects of a class that extends the abstract class, and provide the implementation of the abstract methods in the subclass.
- So, while you cannot create an instance of an abstract class, you can create an instance of a class that extends the abstract class and provides the implementation for the abstract methods.

Can we write Webdriver driver = new Webdriver(); ?

- No, you cannot write WebDriver driver = new WebDriver(); in Java. This is because WebDriver is an interface in Selenium, and you cannot create an instance of an interface directly selenium.dev.
- To use the WebDriver interface, you need to create an instance of a class that implements this interface. For example, if you want to use the Chrome browser, you would use the ChromeDriver class, which implements the WebDriver interface:
- Example: WebDriver driver = new ChromeDriver();

In this example, driver is an instance of ChromeDriver, which is a class that implements the WebDriver interface [Source.

What is the purpose of using Constructors in Java?

1. Object Initialization: Constructors are used to set up the initial state of an object when it is created. This means you can initialize instance variables, perform necessary setup tasks, and ensure that the object is in a valid state from the moment it's created.
2. Providing Default Values: Constructors can provide default values for an object's fields, ensuring that even if a user doesn't explicitly specify values for all fields, the object still has meaningful initial values.
3. Encapsulation: Constructors can be used to encapsulate the details of how an object is created. This allows you to hide the complexities of object creation from the users of your class.
4. Overloading: Java supports constructor overloading, which means you can define multiple constructors for a class with different parameter lists. This allows you to create objects with different sets of initial values or behaviors.

5. Initialization Order: Constructors determine the order in which fields are initialized. This can be important when you have fields that depend on each other or have specific initialization requirements.

6. Inheritance: Constructors play a role in inheritance. Subclasses can call the constructors of their parent classes using the super keyword to ensure that the parent class's initialization is also performed.
7. Dependency Injection: Constructors can be used for dependency injection, where you pass objects or dependencies required by the class as parameters to the constructor. This is a fundamental concept in achieving loose coupling and better testability in your code.

In summary, constructors in Java are essential for creating and initializing objects, controlling their initial state, and providing a way to set up the object's properties and behaviors in a consistent and controlled manner. They play a crucial role in defining how objects of a class are created and what their initial properties are.

How Constructors are different from Methods in Java?

1-Purpose:

-Constructors: Constructors are special methods used for initializing objects of a class. They are automatically called when an object is created and are responsible for setting up the initial state of the object.

-Methods: Methods, also known as member functions, are used to define the behavior and operations that objects of a class can perform. They are called explicitly by the user to execute a specific task or action.

2-Name:

-Constructors: Constructors have the same name as the class they belong to. They do not have a return type, not even void.
-Methods: Methods have names that describe the action they perform and can have a return type, which specifies the type of value they return (or void if they don't return anything).

3-Return Type:
-Constructors: Constructors do not have a return type. They implicitly return an instance of the class they belong to.
-Methods: Methods have a return type that specifies the type of value they return (or void if they don't return anything).

4-Invocation:
-Constructors: Constructors are invoked automatically when an object is created using the new keyword. You cannot call a constructor explicitly.
-Methods: Methods are called explicitly by the user of the class, using the object's reference and the dot operator.

5-Overloading:
-Constructors: Constructors can be overloaded, meaning you can define multiple constructors with different parameter lists within a class. This allows for different ways to initialize objects.
-Methods: Methods can also be overloaded, allowing you to define multiple methods with the same name but different parameter lists. Overloaded methods are distinguished by their parameter types and/or number of parameters.

6-Return Value:
-Constructors: Constructors don't return a value. They return a new instance of the class.
-Methods: Methods can return a value of the specified return type. If a method has a void return type, it doesn't return any value.

7-Use Cases:
-Constructors: Used for initializing object state. They are typically used for setting initial values for instance variables.
-Methods: Used for defining the behavior of objects. They encapsulate the actions or operations that objects can perform.

In summary, constructors and methods have different roles and characteristics in Java. Constructors are responsible for object initialization, have no return type, and are invoked automatically during object creation. Methods, on the other hand, are used to define object behavior, can have a return type, and are called explicitly by the programmer when needed.

What is the purpose of using 'this' keyword in Java?

1.To refer to current class instance variables: If a field is shadowed by a method or constructor parameter, this keyword can be used to refer to the class instance variable.

2.To invoke current class method: this keyword can be used to invoke the method of the current class javatpoint.com.
3.To invoke current class constructor: The this() constructor call can be used to invoke the current class constructor. It is used for constructor chaining. The call to this() must be the first statement in the constructor javatpoint.com.
4.To pass as an argument in the method: The this keyword can also be passed as an argument in the method. It is mainly used in event handling javatpoint.com.
5.To return current class instance: this keyword can be used to return the current class instance from a method. In such case, the return type of the method must be the class type (non-primitive)
-While the this keyword is a useful tool for working with objects in Java, it should be used judiciously and only when necessary. Overuse of this can make the code harder to read and understand. Using this unnecessarily can add unnecessary overhead to the program. Using this in a static context results in a compile-time error.
What is Overloading in Java?
- In Java, method overloading is a feature that allows you to define multiple methods in a class with the same name but with different parameter lists. These methods can have different numbers of parameters or different data types for their parameters. Method overloading enables you to provide multiple ways to perform a similar operation based on the number or types of arguments passed to the method.
Key points about method overloading in Java:
1.Method Name: Overloaded methods must have the same name within the same class.
2.Parameter Lists: The parameter lists of overloaded methods must differ in one of the following ways:
- The number of parameters is different.
- The data types of parameters are different.
- The order of data types in the parameter list is different.

3.Return Type: The return type of a method is not considered when overloading. Two methods with the same name and parameter lists but different returntypes are not considered overloaded.

Overloading methods can increase the readability of the program and provide more flexibility when calling methods

What is the purpose of using Packages in Java?

- In Java, packages serve several important purposes in organizing and structuring your code. Packages are a way to group related classes and provide a hierarchical organization for your Java source files. The primary purposes of using packages in Java are as follows:
1.Namespace Management: Packages provide a mechanism for managing namespaces. They help prevent naming conflicts between classes and types. Without packages, it

would be challenging to use libraries or frameworks that may define classes with common names.

2.Code Organization: Packages help you organize your code into meaningful and logical groups. This makes it easier to find, understand, and maintain code. You can structure your codebase hierarchically, creating sub-packages within packages, as needed.

3.Access Control: Packages provide a level of access control. You can declare classes and members with package-private (default), protected, or public access. This allows you to control which parts of your code can be accessed from other classes and packages.

4.Reusability: Packages facilitate code reuse. You can create reusable libraries or modules by packaging related classes and distributing them. Other developers can then use your packages and classes in their own projects.

5.Security: Packages can be used to encapsulate code and provide access controls. This is important for creating secure systems where certain classes or components should not be accessible from outside the package.

6.Distribution: When you create Java libraries or applications, you can package them into JAR (Java Archive) files. These JAR files can include multiple classes and packages, making it easy to distribute and share your code with others.

7.Documentation: Packages also help in documenting and understanding code. They indicate the organization and structure of a codebase. This is particularly useful in large projects or when working with teams.

Keyword used by Java class to inherit the properties of another Class?

-In Java, the extends keyword is used to inherit the properties and behavior (methods and fields) of another class. This process is known as inheritance. When you create a new class that extends another class, it becomes a subclass (or derived class), and the class it extends is referred to as the superclass (or base class). The subclass inherits all the public and protected members of the superclass and can also add its own members or override the inherited methods.

- It's important to note that the extends keyword is used for single inheritance, where a class can only extend from one superclass. Also, the extends keyword is used to inherit the properties of a class, not an interface. To inherit an interface, the implements keyword is used.
- Inheritance in Java is a "is-a" relationship. For example, if we have a Vehicle class and a Car class, we can say that Car is a Vehicle. This relationship is expressed as Car extends Vehicle.

A subclass can also override the methods of its superclass, providing its own implementation for those methods. This is done using the @Override annotation.

- It's important to note that Java supports single inheritance, which means a class can only inherit from one superclass. However, a class can implement multiple interfaces to achieve a form of multiple inheritance through interface implementation.

How to access the variables and methods of another Class in Java?

-In Java, you can access the variables and methods of another class by creating an instance of that class or by using static members if the variables or methods are declared as static. The accessibility depends on the access modifiers (public, private, protected, default/package-private) applied to the members in the class you want to access.

-In Java, you can access the variables and methods of another class using several methods:

1.Create an Object of Another Class: You can create an instance (object) of another class and then access its public variables and methods using the dot operator (.).

2.Access Static Variables: Static variables belong to the class itself, not to any specific instance of the class. You can access static variables using the class name.

3. Access Variables in a Subclass: If a class extends another class, it can access the public variables of the superclass.

4.Call Methods of Another Class: You can call the public methods of another class by creating an instance of that class and using the dot operator (.)

- Remember, to access a variable or method from another class, it must be declared as public or protected. If it's declared as private, it can only be accessed within the same class.

- In summary, the accessibility of variables and methods in another class depends on their access modifiers and the relationship between the classes (e.g., same package, subclass, etc.). You can create instances of the class or access static members to interact with these members as needed.

What is Overriding in Java ?

In Java, method overriding is a feature that allows a subclass to provide a specific implementation for a method that is already defined in its superclass. When a subclass defines a method with the same signature (name, return type, and parameters) as a method in its superclass, it is said to override that method.

Here are the key points about method overriding in Java:

1. Method Signature: The overriding method must have the same method signature as the overridden method in the superclass. This includes the method name, return type, and parameter types.

2. Access Modifier: The access level of the overriding method must be the same or more accessible than the overridden method. For example, if the overridden method is declared as public, the overriding method in the subclass must also be public.
3. Return Type: The return type of the overriding method must be the same as, or a subtype of, the return type of the overridden method. Starting from Java 5, it's also possible to use covariant return types, which means that the return type in the subclass can be a subclass of the return type in the superclass.
4. Exceptions: The overriding method is allowed to throw the same, narrower, or no exceptions compared to the overridden method. It is not allowed to throw broader exceptions

Is Overriding applicable for Constructors in Java?

- No, method overriding is not applicable to constructors in Java. Constructors are a special type of method used for initializing objects, and they do not follow the same rules and principles as regular methods when it comes to overriding. In Java, constructors are not inherited and, therefore, cannot be overridden in the same way that regular methods can be.

- Here are some key points related to constructors in Java:

1. Constructors are not inherited: Subclasses do not inherit constructors from their superclass. Each class, including subclasses, must define its own constructors.
2. Constructors are not polymorphic: Constructors do not participate in polymorphism, which means that you cannot use a subclass constructor in place of a superclass constructor, and vice versa.
3. Superclass constructors: If a subclass does not explicitly call a superclass constructor using super(...), the compiler automatically inserts a call to the default (no-argument) constructor of the superclass. This allows the superclass to initialize its state.
4. Explicit constructor chaining: If you do want to call a specific constructor in the superclass from a subclass constructor, you can use the super(...) keyword to explicitly invoke a constructor from the superclass.

- In summary, constructors in Java are not subject to method overriding and inheritance in the same way that regular methods are. Each class, including its subclasses, must define its constructors, and they are not polymorphic.

What are the different modifiers in Java?

1. Access Modifiers: These are used to set the accessibility of a class, method, or variable. There are four types of access modifiers:

- Public: The class, method, or variable can be accessed from any other class in any package baeldung.com.
- Protected: The class, method, or variable can be accessed within the same package and also by subclasses in other packages baeldung.com.
- Private: The class, method, or variable can only be accessed within the same class baeldung.com.
- Default (No keyword): The class, method, or variable can be accessed within the same package. This is the default access level if no access modifier is specified javatpoint.com.

2. Non-Access Modifiers: These are used to change the behavior of a class, method, or variable. Some common non-access modifiers are:

- Static: A static method or variable belongs to the class itself, not to any instance of the class. It can be accessed without creating an object of the class w3schools.com.
- Final: A final class cannot be subclassed. A final method cannot be overridden. A final variable must be initialized when it is declared and cannot be changed afterwards tutorialspoint.com.
- Abstract: An abstract class cannot be instantiated, and it may contain one or more abstract methods. A method is declared abstract by using the keyword abstract tutorialspoint.com.
- Synchronized: The synchronized keyword is used to control the access of multiple threads to any shared resource.
- These modifiers are essential for encapsulation, controlling access, and designing classes and code that adhere to the principles of object-oriented programming. They help you create classes and objects that meet specific requirements and follow best practices.

Members with default access are accessible only within the same package. They are not visible to classes in other packages.

2.Protected:

The "protected" access modifier allows members to be accessed within the same package, just like default, but it also allows access from subclasses, even if they are in a different package.

Subclasses can access protected members using inheritance.

- To summarize, the key difference between "default" and "protected" access modifiers in Java is that "default" members are only accessible within the same package, while "protected" members are accessible within the same package and by subclasses, even if they are in different packages.

How to select a radio button in Selenium WebDriver?

- To select a radio button in Selenium WebDriver, you can use various locator strategies like ID, name, XPath, and CSS Selector. After locating the radio button,you can select a radio button using the click() method on a radio button element.

1. Using ID Locator

driver.findElement(By.id("radioButtonId")).click();

2. Using Name Locator

driver.findElement(By.name("radioButtonName")).click();

3. Using XPath Locator

driver.findElement(By.xpath("//input[@id='radioButtonId']")).click();

4. Using CSS Selector Locator

driver.findElement(By.cssSelector("input[id='radioButtonId']")).click();

Before selecting a radio button, it's a good practice to verify if the radio button is displayed and enabled on the page. You can use the isDisplayed() and isEnabled() methods for this purpose.

Why do you get NoSuchElementException?

A NoSuchElementException is typically an exception that occurs in programming, often in the context of data structures and collections, to indicate that an operation was performed to access an element that does not exist or is not found.
In other hand the NoSuchElementException is an unchecked exception in Java that is thrown when an attempt is made to retrieve an element that doesn't exist. This typically happens when you're using methods like next(), nextElement(), or nextToken() on an Iterator, Enumerator, or Scanner object, and there are no more elements to retrieve.

To avoid NoSuchElementException errors, it's essential to check the state of your data structures and iterators before attempting to access or retrieve elements. You can use conditional statements, such as if checks, to ensure that the element you're trying to access exists or that the iterator still has more elements to return.

How can we fetch the page source in Selenium?

In Selenium, you can fetch the page source using the page_source attribute of the WebDriver object. This attribute returns the HTML source of the current page.

How can we fetch the title of the page in Selenium?

In Selenium, you can fetch the title of the current page using the title attribute or getTitle() method of the WebDriver object. This attribute or method returns the title of the current page.

What is the difference between static and instance variable in Java?

1-Instance Variables:

Also known as non-static variables or member variables.
Each instance (object) of a class has its own separate copy of an instance variable.
In other words, each object can have different values for these variables.
They are declared without the static keyword and are associated with the instance of the class.
Instance variables are used to store state or attributes that are unique to each object created from the class.
They are typically accessed and modified using object references.
The values of instance variables are not shared among different instances of the class.
Changes to an instance variable in one object do not affect the values in other objects of the same class.
2-Static Variables:
Also known as class variables.
There is only one copy of a static variable that is shared among all instances (objects) of the class.
They are declared with the static keyword and are associated with the class itself rather than with individual objects.
Static variables are used to store data that is common to all instances of a class. For example, constants, counters, or shared resources.
They are typically accessed using the class name, and you can also access them through an object reference, although it is not recommended.
Changes to a static variable in one object will affect the values seen by other objects of the same class.
Key Differences:
- Scope: Instance variables are accessible only within the instance (object) they belong to, while static variables are accessible without creating an instance of the class .
- Lifecycle: Instance variables are created when an instance of the class is created, and they are destroyed when the instance is destroyed. Static variables are created when the class is loaded into memory, and they exist for the lifetime of the program.
- Memory: Instance variables are stored in the heap memory, while static variables are stored in the static memory (also known as the method area)
- Usage: Instance variables are used when we want to maintain a value for each object separately. Static variables are used when we want to maintain a single value for all objects

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

1.Static Methods:

Static methods are associated with the class itself, rather than with individual instances (objects) of the class.

They are declared with the static keyword.

Static methods can be called using the class name, and they can also be called using an object reference, although it's considered a better practice to call them using the class name.

Static methods cannot access or modify instance-specific (non-static) variables or methods of the class directly. They can only access and modify other static members.

They are often used for utility functions, constants, and operations that do not depend on the state of a specific instance.

2.Non-Static Methods (Instance Methods):

Non-static methods are associated with instances (objects) of a class. Each object of the class has its own copy of these methods.

They are declared without the static keyword.

Non-static methods can access and modify both static and instance-specific members of the class.

They are used to perform operations that are specific to each instance of the class and can depend on the state of the object.

- Key Differences:

. Access: Static methods can only access static members, while non-static methods can access both static and non-static members.

. Binding: Static methods use compile-time binding, while non-static methods use run-time binding examples.

Memory Allocation: Static methods occupy less space and memory allocation happens once, while non-static methods may occupy more space and memory allocation happens when the method is invoked examples.javacodegeeks.com.

. Usage: Static methods are used for utility methods and constants that are not specific to individual instances, while non-static methods are used for instance-specific behavior.

- In summary, static methods are associated with the class itself and are shared among all instances, while non-static methods are specific to each object created from the class and can access both static and instance-specific members of the class. The choice of whether to use a static or non-static method depends on the functionality you want to implement and whether it is related to the class as a whole or to specific instances of the class.

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

1-Abstract Classes:

.Method Definitions: Abstract classes can have both abstract (unimplemented) and concrete (implemented) methods. Abstract methods are declared using the abstract keyword, and they must be implemented by any concrete subclass. Concrete methods can also be provided, and they have a default implementation in the abstract class itself.

.Fields: Abstract classes can have fields (variables), which can be either instance variables or class variables. These fields can have access modifiers and are inherited by subclasses.

.Constructors: Abstract classes can have constructors, and they are called when an instance of a concrete subclass is created.

.Inheritance: A class can extend only one abstract class, which means Java supports single inheritance of abstract classes.

.Usage: Abstract classes are typically used when you want to provide a common base class with some shared implementation and leave some methods to be implemented by concrete subclasses.

2-Interfaces:

.Method Signatures: Interfaces can only have method signatures (declarations) without any method bodies. All methods declared in an interface are implicitly public and abstract. Implementing classes must provide concrete implementations for all the methods defined in the interface.

.Fields: Interfaces can have fields, but they are implicitly public, static, and final. They are treated as constants, and subclasses can use them directly without redeclaring.

.Constructors: Interfaces cannot have constructors because they cannot be instantiated.

.Inheritance: A class can implement multiple interfaces, allowing for multiple inheritance of method contracts.
.Usage: Interfaces are used when you want to define a contract that multiple classes can adhere to. They enable classes to have multiple roles or capabilities by implementing multiple interfaces.
3-Key Differences
.A class can inherit from only one abstract class, but it can implement multiple interfaces. This is because an abstract class represents a type of object, while an interface represents a set of behaviors.
.Abstract classes can have access modifiers such as public, protected, and private for their methods and properties, while interfaces can only have public access.
.An abstract class can have member variables, while an interface cannot.
.Abstract classes can have implemented and abstract methods, while interfaces can only have abstract methods.
.Starting from Java 8, interfaces can have default and static methods with a body, which allows them to have some level of implementation, similar to abstract classes.
 - In summary, you would use an abstract class when you want to provide a base class with some common functionality and implementation that can be reused by subclasses. On the other hand, you would use an interface when you want to define a set of methods that a class must implement, without providing any specific implementation.

What is the keyword used for inheriting the interfaces in Java?

In Java, the keyword used for inheriting interfaces is implements. This keyword is used by a class to inherit the methods and constants from an interface. The class must provide the implementation for all the methods declared in the interface.
A class can implement multiple interfaces in Java. If a class implements multiple interfaces, it must provide the implementation for all methods declared in all the interfaces.
An interface can also extend another interface using the extends keyword. When a class implements an interface that extends another interface, it must provide an implementation for all methods required by the interface inheritance chain.

Can Captcha be automated using Selenium?

Captcha (Completely Automated Public Turing test to tell Computers and Humans Apart) challenges are specifically designed to prevent automated bots, including those controlled by Selenium, from accessing certain web services or resources. The idea behind a CAPTCHA is to distinguish between human and automated bot interactions.
While it is technically possible to automate some CAPTCHA challenges using Selenium, doing so may not be ethical or legal, and it may violate the terms of service of the website you are interacting with. Here are a few important points to consider:

1- Ethical and Legal Considerations: Automating CAPTCHA-solving may be considered unethical or even illegal, depending on the website's terms of service and the laws in your jurisdiction. It can be seen as an attempt to circumvent security measures put in place by the website to protect its services.

2- Effectiveness of Automation: CAPTCHA challenges are designed to be challenging for automated scripts. Some CAPTCHA mechanisms use advanced techniques to detect and prevent automation, making it difficult to reliably automate the solving process.

3- Rate Limiting and IP Blocking: Many websites have rate limiting and IP blocking mechanisms to prevent or slow down automated bot traffic. If you attempt to automate CAPTCHA solving, you might encounter these mechanisms.

4- Alternatives: Instead of automating CAPTCHA solving, it's better to consider alternative approaches. Websites that use CAPTCHAs often have them for a reason, such as preventing abuse or protecting user data. Contact the website administrator or developer to see if there are alternative ways to access the information or services you need.

5-Third-Party CAPTCHA Solvers: Some services and tools claim to automate CAPTCHA solving. However, they may not be reliable, and their use may still violate terms of service or legal regulations.

In summary, while it may be technically possible to automate CAPTCHA solving with Selenium or other tools, it's generally not advisable, and doing so could lead to legal and ethical issues. It's important to respect the security mechanisms put in place by websites and seek alternative methods for interacting with them when CAPTCHAs are involved.

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

1-Using the clear() method: This is the simplest way to clear the text inside a text box. The clear() method clears the value of any text type element.

```
WebElement element = driver.findElement(By.id("text-input-where"));
element.clear();
```

2-Using sendKeys(Keys.CONTROL + "a") and sendKeys(Keys.DELETE): This method simulates the keyboard shortcut Ctrl+A (select all) and Delete (delete selected text).

```
WebElement element = driver.findElement(By.id("text-input-where"));
element.sendKeys(Keys.CONTROL + "a");
element.sendKeys(Keys.DELETE);
```

What is the default timeout of Selenium WebDriver?

Selenium WebDriver doesn't have a default global timeout for waiting, as it relies on explicit or implicit waits to control how long it waits for elements to become available or meet certain conditions. These waits help avoid synchronization issues when interacting with web pages.

1-Implicit Wait: You can set a global implicit wait, which is applied to all elements in the WebDriver instance. The implicit wait specifies the maximum amount of time the WebDriver should wait for an element to be present before throwing an exception. If an element is found before the specified wait time, the WebDriver proceeds with the next step. If the wait time is exceeded, it will throw a TimeoutException. The default value for implicit wait is 0 seconds.
Here's how you can set an implicit wait:

```
WebDriver driver = new ChromeDriver();
driver.manage().timeouts().implicitlyWait(10, TimeUnit.SECONDS);
```

2-Explicit Wait: An explicit wait allows you to specify a wait condition for a specific element, with a timeout. This is more fine-grained than the global implicit wait. It lets you wait for elements to meet specific conditions, such as visibility, clickability, or custom conditions, with a defined timeout. You use the WebDriverWait class to implement explicit waits.
Here's an example of using explicit wait:

```
WebDriverWait wait = new WebDriverWait(driver, 10);
WebElement element =
wait.until(ExpectedConditions.visibilityOfElementLocated(By.id("elementId")));
```

- In summary, Selenium WebDriver does not have a default global timeout, but it provides options for setting timeouts through implicit waits and explicit waits. You can configure these timeouts based on your requirements to handle different synchronization scenarios while interacting with web elements.

How can I submit a form in selenium?

In Selenium with Java, you can submit a form using the `submit()` method on a WebElement representing the form. Here's a basic example:

```
import org.openqa.selenium.By;
import org.openqa.selenium.WebDriver;
import org.openqa.selenium.WebElement;
import org.openqa.selenium.chrome.ChromeDriver;

public class FormSubmissionExample {

    public static void main(String[] args) {
        // Set the path to the ChromeDriver executable
        System.setProperty("webdriver.chrome.driver", "path/to/chromedriver");

        // Create a new instance of the ChromeDriver
        WebDriver driver = new ChromeDriver();

        // Navigate to the webpage with the form
        driver.get("https://example.com");
        // Find the form element by its ID, name, or other locators
        WebElement form = driver.findElement(By.id("formId"));
        // Perform actions on the form, such as filling out fields
        WebElement usernameField = form.findElement(By.id("username"));
        usernameField.sendKeys("your_username");
        WebElement passwordField = form.findElement(By.id("password"));
        passwordField.sendKeys("your_password");
        // Submit the form
        form.submit();
        // Close the browser
        driver.quit();
    }
}
```

What is the purpose of getOptions() method?

- The getOptions() method in Selenium WebDriver is used to retrieve all the options from a dropdown (select) element. This method is part of the Select class in Selenium and it returns a list of all options belonging to the select tag.
- The getOptions() method can be useful in various scenarios such as verifying the options in a dropdown, selecting an option based on its text or value, or performing actions on all options.
- The getOptions() method is specifically used for multi-select dropdowns and allows you to work with the options that have been selected by the user.

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

- To find all the hyperlinks on a webpage using XPath, you can use the //a selector. The // operator in XPath is used to select nodes in the document from the current node that match the selection no matter where they are. The a tag is used for hyperlinks in HTML.

the XPath expression to find all hyperlinks: //a

- If you want to get the href attribute (the URL) of all hyperlinks, you can modify the XPath expression like this:

    //a/@href

- If you want to find hyperlinks that contain a specific text, you can use the contains() function in XPath.

  //a[contains(text(), 'specific text')]

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

The Select class in Selenium WebDriver is used to interact with the HTML SELECT tag, which represents a drop-down list. The Select class provides several methods to select and deselect options from a drop-down list, and to retrieve the selected options.

1-Creating an instance of the Select class: You need to create an instance of the Select class by passing the WebElement representing the drop-down list to the Select constructor.
WebElement dropdownElement = driver.findElement(By.id("dropdown-id"));
Select select = new Select(dropdownElement);
This code will find the drop-down list with the id "dropdown-id" and create a Select object for it.
2-Selecting an option by visible text: You can select an option from the drop-down list by its visible text using the selectByVisibleText() method.
3-select.selectByVisibleText("Option Text");
This code will select the option with the visible text "Option Text" from the drop-down list browserstack.com.
4-Selecting an option by value: You can select an option from the drop-down list by its value using the selectByValue() method.
select.selectByValue("Option Value");
This code will select the option with the value "Option Value" from the drop-down list.
5-Getting all options: You can get all options from the drop-down list using the getOptions() method.
List<WebElement> options = select.getOptions();
This code will get all options from the drop-down list browserstack.com.
6-Getting the first selected option: You can get the first selected option from the drop-down list using the getFirstSelectedOption() method.
WebElement firstSelectedOption = select.getFirstSelectedOption();

How to handle alerts in Selenium WebDriver?

In Selenium WebDriver, alerts are dialog boxes in a web application that notify users or request user input. Selenium provides methods to handle alerts and interact with them during test execution.
Here is how you can handle alerts in Selenium WebDriver:
Switching to the alert: Before you can interact with an alert, you need to switch to it using the switchTo().alert() method.
- Alert alert = driver.switchTo().alert();

Accepting the alert: You can accept the alert using the accept() method. This is typically used to click the "OK" button in a confirmation alert.
- alert.accept();

Dismissing the alert: You can dismiss the alert using the dismiss() method. This is typically used to click the "Cancel" button in a confirmation alert.
- alert.dismiss();

Getting the alert text: You can get the text of the alert using the getText() method.
- String alertText = alert.getText();

Sending input to the alert: If the alert is a prompt alert, you can send input to it using the sendKeys() method.
- alert.sendKeys("input text");
These are the basic ways to handle alerts in Selenium WebDriver. The exact methods you should use may depend on the type of alert you are dealing with. For example, you might use the accept() method to click the "OK" button in a confirmation alert, or the dismiss() method to click the "Cancel" button in a confirmation alert.

What is click() command in Selenium WebDriver?

- The click() command in Selenium WebDriver is used to simulate a mouse click on a web element. This is often used to interact with elements such as buttons, links, or checkboxes on a webpage.

```
  WebElement element = driver.findElement(By.id("button-id"));
  element.click();
driver.findElement(By.xpath("//span[.='Text']")).click();
```

- The click() command can be used with any web element that can be interacted with via a mouse click. However, some elements may require additional steps or commands to interact with properly. For example, you may need to scroll to the element before clicking on it, or you may need to wait for the element to become clickable.

In Selenium WebDriver, the click() method is used to simulate a mouse click on a web element, typically a clickable element like a button, link, or checkbox. It is one of the most fundamental and commonly used methods in Selenium for interacting with web pages.

What is sendKeys() command in Selenium WebDriver?

The sendKeys() command in Selenium WebDriver is used to simulate keystrokes in a web application. It is often used to interact with input elements such as text fields, text areas, and dropdown lists.

```
WebElement element = driver.findElement(By.id("text-field-id"));
element.sendKeys("input text");
```

You can also use the sendKeys() command to simulate special keystrokes. For example, you can simulate pressing the Tab key like this:

```
WebElement element = driver.findElement(By.id("text-field-id"));
element.sendKeys(Keys.TAB);
```

The sendKeys() command can be used with any web element that can be interacted with via keystrokes. However, some elements may require additional steps or commands to interact with properly. For example, you may need to click on the element before typing into it, or you may need to wait for the element to become editable.

The sendKeys() method is an essential command for automating text input in Selenium and can be used to simulate the typing of text, pressing special keys (e.g., Enter, Tab), and more. It allows you to automate the filling of web forms, password fields, search boxes, and other input elements.

How to delete cookies in Selenium?

- In Selenium WebDriver, you can delete cookies for the current session or specific cookies associated with a domain using the deleteCookie and deleteCookieNamed methods provided by the WebDriver interface. These methods allow you to remove cookies from the browser's cookie store. Here's how to use them:

- To delete a specific cookie by its name, you can use the deleteCookieNamed method. You need to provide the name of the cookie you want to delete. For example:
driver.manage().deleteCookieNamed("cookieName");
- To delete all cookies for the current session, you can use the deleteAllCookies method. This will remove all cookies stored by the browser during the current session:
driver.manage().deleteAllCookies();

After deleting cookies, the browser session will no longer have access to the deleted cookies, and you'll effectively start with a clean cookie state.

- Note that these methods are available for the WebDriver.Options interface, which you can access through driver.manage(). The specific methods you use depend on your requirements. Deleting cookies can be useful for scenarios where you want to ensure that the browser is in a clean state before or after certain actions in your Selenium tests.

How to get the href of a link?

- To get the href attribute of a link (anchor element) in Selenium WebDriver, you can use the getAttribute() method on the WebElement representing the link.
- The getAttribute() method in Selenium WebDriver is used to get the value of an attribute of a web element. If you want to get the href of a link (which is an attribute of the a tag in HTML), you can use the getAttribute() method with "href" as the argument.

Here is an example of how to use the getAttribute() method to get the href of a link:
WebElement link = driver.findElement(By.id("link-id"));
String href = link.getAttribute("href");

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

To click on a menu item in a dropdown menu using Selenium WebDriver, you need to perform a series of actions to navigate to the dropdown menu, locate the desired menu item, and then click on it. Here's a step-by-step guide on how to do this:
Open the webpage and locate the dropdown menu:
First, open the webpage and locate the dropdown menu. You can use a suitable method to locate the dropdown menu, such as By.id, By.name, By.xpath, or any other method.
WebElement dropdownMenu = driver.findElement(By.id("menu-dropdown"));
Create an instance of the Actions class
You can use the Actions class in Selenium to perform complex interactions like navigating dropdown menus. Create an instance of the Actions cla

Actions actions = new Actions(driver);
Move to the dropdown menu:
Use the moveToElement() method to move the mouse cursor to the dropdown menu. This action can make the dropdown menu visible, which is necessary to interact with it.
actions.moveToElement(dropdownMenu).perform();
Locate and click the menu item:
After moving to the dropdown menu, you can locate the specific menu item within the menu and click on it. Use a suitable method to locate the menu item, such as By.linkText, By.partialLinkText, By.xpath, or others. Then, perform a click action on the menu item.
WebElement menuItem = driver.findElement(By.linkText("Menu Item 1"));
actions.click(menuItem).perform();
Handle dropdown navigation (if necessary):
Depending on how the dropdown menu works, clicking on a menu item may result in a navigation event, opening a new page or changing the content. You may need to wait for elements to load or for a specific condition to be met after clicking the menu item.

How to get typed text from a textbox?

To get the typed text from a textbox or input field in Selenium WebDriver, you can use the getAttribute() method to retrieve the value attribute of the input element. The value attribute contains the currently entered text in the input field.

How to type text in a new line inside a text area?

To type text in a new line inside a <textarea> element using Selenium WebDriver, you can simulate the use of the "Enter" or "Return" key to create a new line within the text area. Here's how you can achieve this:
1-Locate the <textarea> element:
First, locate the <textarea> element using a suitable method, such as By.id, By.name, By.xpath, or another locator method. Store it in a WebElement variable.
WebElement textArea = driver.findElement(By.id("myT
<textarea>. To create a new line, you need to use the "Keys.RETURN" key to simulate p
extArea"));
2-Use sendKeys() to input text:
You can use the sendKeys() method to enter text into the ressing the "Enter" key.
3-textArea.sendKeys("Line 1");
textArea.sendKeys(Keys.RETURN); // Simulate pressing Enter key
4-textArea.sendKeys("Line 2");
In the code above, we input "Line 1," simulate pressing "Enter," and then input "Line 2." This sequence of actions will create a new line inside the <textarea>.
5-Submit the form (if needed):
If the text area is part of a form, you might need to submit the form to save the text input.
WebElement submitButton = driver.findElement(By.id("submit-button"));

```
submitButton.click();
```

How to resize browser window using selenium WebDriver?

Eample: Resize the browser window to a specific size

```
    Dimension newSize = new Dimension(800, 600);
    driver.manage().window().setSize(newSize);
```

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

To scroll a webpage up and down using Selenium WebDriver, you can use the execute_script() method. This method allows you to execute JavaScript code within the context of the currently selected frame or window in Selenium.

How to perform right click(Context click)action in selenium WebDriver?

In Selenium WebDriver, you can perform a right-click (context click) action using the `Actions` class. The `Actions` class provides a way to perform complex user interactions, such as right-clicking, double-clicking, dragging, etc. Here's an example of how you can perform a right-click using Selenium WebDriver in Java:

```java
import org.openqa.selenium.By;
import org.openqa.selenium.WebDriver;
import org.openqa.selenium.WebElement;
import org.openqa.selenium.chrome.ChromeDriver;
import org.openqa.selenium.interactions.Actions;

public class RightClickExample {
  public static void main(String[] args) {
    // Set the path to the ChromeDriver executable
    System.setProperty("webdriver.chrome.driver", "path/to/chromedriver");

    // Create a new instance of the ChromeDriver
    WebDriver driver = new ChromeDriver();

    // Navigate to the desired website
    driver.get("https://example.com");

    // Find the element on which you want to perform the right-click
    WebElement element = driver.findElement(By.id("exampleElementId"));

    // Create an instance of the Actions class
    Actions actions = new Actions(driver);
```

```
        // Perform a right-click on the element
        actions.contextClick(element).build().perform();

        // Close the browser
        driver.quit();
    }
}
```

How to perform double click action in selenium WebDriver?

In Selenium WebDriver, you can perform a double-click action using the `Actions` class. Here's an example in Java:

```java
import org.openqa.selenium.By;
import org.openqa.selenium.WebDriver;
import org.openqa.selenium.WebElement;
import org.openqa.selenium.chrome.ChromeDriver;
import org.openqa.selenium.interactions.Actions;

public class DoubleClickExample {
    public static void main(String[] args) {
        // Set the path to the ChromeDriver executable
        System.setProperty("webdriver.chrome.driver", "path/to/chromedriver");

        // Create a new instance of the ChromeDriver
        WebDriver driver = new ChromeDriver();

        // Open the web page
        driver.get("https://example.com");

        // Find the element to perform the double-click on
        WebElement element = driver.findElement(By.id("exampleElement"));

        // Create an instance of the Actions class
        Actions actions = new Actions(driver);

        // Perform the double-click action
        actions.doubleClick(element).build().perform();
        // Close the browser
        driver.quit();
    }
}
```

Make sure to replace `"path/to/chromedriver"` with the actual path to your ChromeDriver executable, and `"https://example.com"` with the URL of the webpage you are working on. Additionally, replace `"exampleElement"` with the appropriate identifier or method to locate the element you want to double-click.

This example uses the `Actions` class to create a sequence of actions, including the double-click action, and then performs the action using the `build().perform()` method.

How to perform drag and drop action in Selenium WebDriver?

To perform a drag and drop action in Selenium WebDriver, you can use the Actions class, which provides a convenient way to perform complex user interactions, including drag and drop. Here's how you can perform a drag and drop action in Selenium WebDriver:

```
public class DragAndDropExample {
    public static void main(String[] args) {
        // Set the path to the ChromeDriver executable
        System.setProperty("webdriver.chrome.driver",
"path/to/chromedriver.exe");
        // Initialize the WebDriver
        WebDriver driver = new ChromeDriver();
        // Open a web page with the source and target elements
        driver.get("https://example.com");
        // Locate the source element that you want to drag
        WebElement sourceElement = driver.findElement(By.id("sourceElement"));
        // Locate the target element where you want to drop the source element
        WebElement targetElement = driver.findElement(By.id("targetElement"));
        // Create an instance of the Actions class
        Actions actions = new Actions(driver);
        // Perform the drag and drop action
        actions.dragAndDrop(sourceElement, targetElement).perform();
        // Close the browser
        driver.quit();
    }
}
```

The Actions class provides a wide range of other mouse and keyboard interactions as well, making it useful for automating complex user interactions in Selenium WebDriver. Drag and drop actions can be useful for scenarios where you need to simulate dragging an element and dropping it in another location on a web page.