1. What is Selenium?

Selenium is a portable framework for software testing. Selenium tool facilitates with a playback tool for authoring functional tests without the need to learn a test scripting language.

Selenium is one of the most widely used open source Web UI (User Interface) automation testing suite. **Jason Huggins** developed Selenium in 2004 as an internal tool at **Thought Works**. Selenium supports automation across different browsers, platforms, and programming languages.

### What are the different components of Selenium?

Selenium is not just a single tool but a suite of software's, each having a different approach to support automation testing. It comprises of four major components which include:

1. Selenium Integrated Development Environment (IDE)
2. Selenium Remote Control (Now Deprecated)
3. WebDriver
4. Selenium Grid

### List out the names of programming languages, browsers and operating systems that are supported by Selenium?

**Programming Languages**: C#, Java, Python, PHP, Ruby, Perl, JavaScript.

**Operating Systems**: Android, iOS, Windows, Linux, Mac, Solaris.

**Browsers**: Google Chrome, Mozilla Firefox, Internet Explorer, Edge, Opera, Safari, etc.

### What is Selenium IDE?

Selenium IDE is implemented as Firefox extension which provides record and playback functionality on test scripts. It allows testers to export recorded scripts in many languages like HTML, Java, Ruby, RSpec, Python, C#, JUnit and TestNG.

1. List some of the test types that are supported by Selenium.

Different types of testing's that we can achieve through Selenium are.

* Functional Testing
* Regression Testing
* Sanity Testing
* Smoke Testing
* Responsive Testing
* Cross Browser Testing
* UI testing (black box)
* Integration Testing

### What do you mean by Selenese?

Selenium commands, also known as "Selenese" are the set of commands used in Selenium that run your tests. For example, command - open (URL); launches the desired URL in the specified browser and it accept both relative and absolute URLs.

A sequence of Selenium commands (Selenese) together is known as a test script.

1. What are the different ways of locating a web element in Selenium?

In Selenium, web elements are identified and located with the help of Locators. Locators specify a target location which uniquely defines the web element in the context of a web application. Thus, to identify web elements accurately and precisely we have different types of locators in Selenium:

* ID
* ClassName
* Name
* TagName
* LinkText
* PartialLinkText
* Xpath
* CSS Selector
* DOM

### Explain the difference between assert and verify commands?

**Assert**: Assert command checks if the given condition is true or false. If the condition is true, the program control will execute the next phase of testing, and if the condition is false, execution will stop, and nothing will be executed.

**Verify**: Verify command also checks if the given condition is true or false. It doesn't halt program execution, i.e., any failure during verification would not stop the execution, and all the test phases would be executed.

### List out some of the Automation tools which could be integrated with Selenium to achieve continuous testing.

Selenium can be used to automate functional tests and can be integrated with automation test tools such as **Maven, Jenkins, &Docker** to achieve continuous testing. It can also be integrated with tools such as **TestNG, &JUnit** for managing test cases and generating reports.

1. What do you mean by XPath?

XPath is also defined as XML Path. It is a language used to query XML documents. It is an important approach to locate elements in Selenium. XPath consists of a path expression along with some conditions. Here, we can easily write XPath script/query to locate any element in the webpage. It is developed to allow the navigation of XML documents. The key factors that it considered while navigating are selecting individual elements, attributes, or some other part of an XML document for specific processing. It also produces reliable locators. Some other points about XPath are as follows.

XPath is a language used for locating nodes in XML documents.

XPath can be used as a substitute when you don't have a suitable id or name attribute for the element you want to locate.

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

**Single Slash "/":** Single slash is used to create XPath with absolute path.

**Double Slash "//":** Double slash is used to create XPath with the relative path.

XPath provides locating strategies like:

* 1. XPath Absolute
  2. XPath Attributes

### What are the different types of annotations which are used in Selenium?

### What is the difference between findElement() and findElements()?

**findElement():** It is used to find the first element within the current page using the given "locating mechanism". It returns a single WebElement.

**findElements():** It uses the given "locating mechanism" to find all the elements within the current page. It returns a list of web elements.

1. What is the wait? How many types of waits in selenium?

Selenium Webdriver introduces the concept of waits for the AJAX-based application. There are two types of waits:

Implicit Wait

Explicit Wait

### What is the main disadvantage of implicit wait?

The main disadvantage of implicit wait is that it slows down test performance.

Another disadvantage of implicit wait is:

Suppose, you set the waiting limit to be 10 seconds, and the elements appear in the DOM in 11 seconds, your tests will be failed because you told it to wait a maximum of 10 seconds.

### How can we launch different browsers in Selenium WebDriver?

We have to create an instance of a driver of that particular browser.

1. WebDriver driver =new FirefoxDriver();

Here, "WebDriver" is an interface, and we are creating a reference variable "driver" of type WebDriver, instantiated using "FireFoxDriver" class.

### Write a code snippet to launch Chrome browser in WebDriver?

1. Write a code snippet to perform right-click an element in WebDriver.

We will use **Action class** to generate user event like right-click an element in WebDriver.

1. Actions action = newActions(driver);
2. WebElement element = driver.findElement(By.id("elementId"));
3. action.contextClick(element).perform();
4. Write a code snippet to perform mouse hover in WebDriver.
5. Actions action = newActions(driver);
6. WebElement element = driver.findElement(By.id("elementId"));
7. action.moveToElement(element).perform();

### How do you perform drag and drop operation in WebDriver?

### What are the different methods to refresh a web page in WebDriver?

There are multiple ways of refreshing a page in Webdriver.

1. Using driver.navigate command -

1. driver.navigate().refresh();

2. Using driver.getCurrentUrl() with driver.get() command -

1. driver.get(driver.getCurrentUrl());

3. Using driver.getCurrentUrl() with driver.navigate() command -

1. driver.navigate().to(driver.getCurrentUrl());

4. Pressing an F5 key on any textbox using the sendKeys command -

1. driver.findElement(By textboxLocator).sendKeys(Keys.F5);

5. Passing ascii value of the F5 key, i.e., "\uE035" using the sendKeys command -

1. driver.findElement(By textboxLocator).sendKeys("\uE035");

### Write a code snippet to navigate back and forward in browser history?

Navigate back in browser history:

1. driver.navigate().back();

Navigate forward in browser history:

1. driver.navigate().forward();