Software Testing and Quality Assurance

Name: Varenya Uchil

SAPID: 60004210121

Branch: Computer Engineering C2-2

Experiment No. 8

Aim: To study software Automation Testing tool Selenium for Setting Up the GUI Map

Theory:

Software Automation Testing is a method in which specialized tools are used to execute test cases automatically, validate application functionality, and compare actual outcomes with expected results. **Selenium** is one of the most popular open-source automation testing tools, widely used for testing web applications across different browsers and platforms.

Selenium is a suite of tools designed for automating web browsers. It includes:
- **Selenium WebDriver**: Allows programming scripts in languages like Python, Java, or C# to control browser actions.
- **Selenium IDE**: A Chrome/Firefox plugin for recording and playing back test cases.
- **Selenium Grid**: Allows parallel testing across multiple machines and environments.

GUI Mapping involves identifying and storing all GUI elements (like buttons, text fields, and links) of the application under test in a centralized way. This allows testers to refer to these elements using logical names in the test scripts, improving readability and maintainability.
In Selenium, GUI mapping is achieved by locating elements using selectors like:
- **ID**
- **Name**
- **Class Name**
- **Tag Name**
- **XPath**
- **CSS Selectors**

Benefits of GUI Mapping with Selenium
- Easier test script maintenance

- Improved test readability
- Reusability of locator definitions
- Supports regression and continuous testing pipelines

Code and Output:

```python
from selenium import webdriver
from selenium.webdriver.common.by import By
from selenium.webdriver.common.keys import Keys
from selenium.webdriver.support.ui import WebDriverWait
from selenium.webdriver.support import expected_conditions as EC
import time

# Initialize the Chrome WebDriver
driver = webdriver.Chrome()

# Step 1: Open Wikipedia
driver.get("https://www.wikipedia.org/")
driver.maximize_window()

# Step 2: Wait for the search input box and enter "India"
search_input = WebDriverWait(driver, 10).until(
    EC.element_to_be_clickable((By.ID, "searchInput"))
)
search_input.send_keys("India", Keys.ENTER)

# Step 3: Wait for the article page to load
WebDriverWait(driver, 20).until(
    EC.title_contains("India")
)

# Optional: Print the title to verify
print("Page title is:", driver.title)

# Wait a few seconds to view the result (or for any screenshot)
time.sleep(10)

# Step 4: Close the browser
```
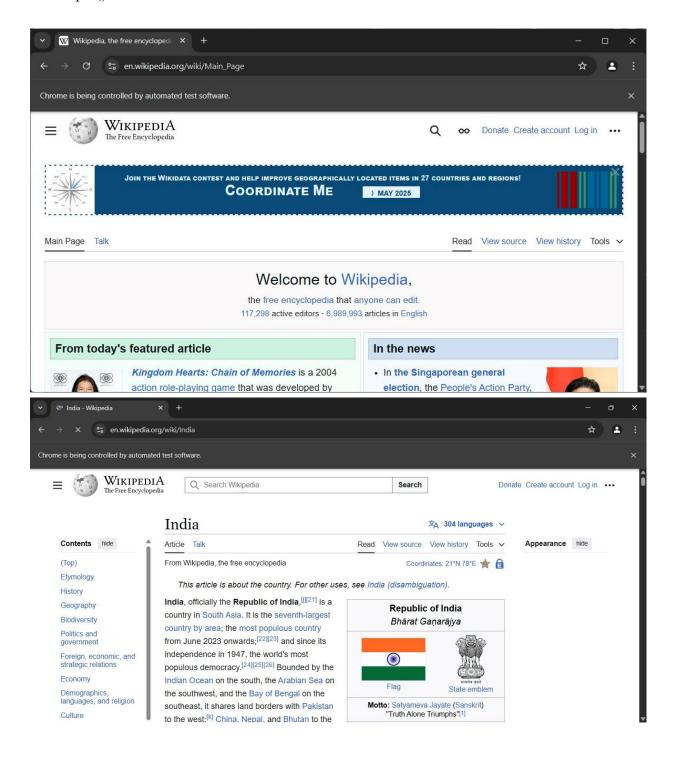
driver.quit()

Observations:

Through this experiment, we observed seamless navigation to the Wikipedia website, successful maximization of the browser window and executing the sequence of actions to locate the search box, submit the search query for "India", and display the results before closing the browser window.

Conclusion:

In conclusion, setting up the **GUI Map using Selenium** is a critical best practice for building scalable and robust automation testing frameworks. It enhances the clarity and effectiveness of test scripts, especially in large-scale or frequently changing web applications.