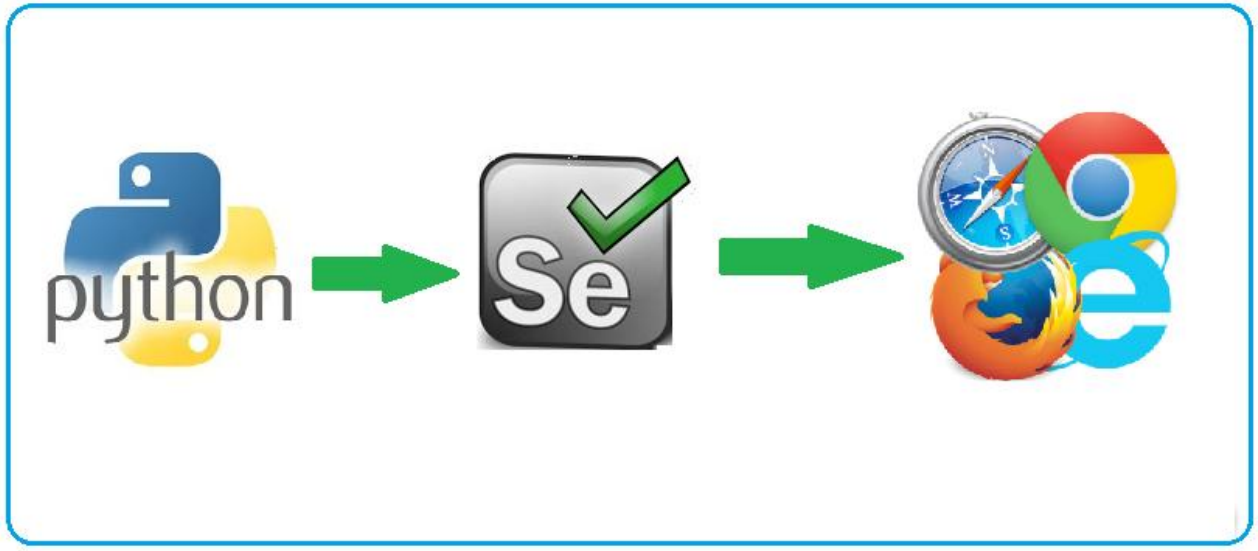
Selenium with Python – Automating the Web



Introduction to Selenium

- Selenium is an open-source tool for automating web browsers.
- Originally developed for testing web applications.
- Works with all major browsers and OS.
- Supports multiple programming languages: Python, Java, C#, Ruby, etc.

Use Selenium with Python?

- Python is easy to write, read, and debug.
- Rich ecosystem and libraries.
- Great for test automation, scraping, and bots.

Selenium Components

- Selenium WebDriver – Core API to automate browser actions.
- Selenium IDE – Chrome/Firefox extension for record and playback.
- Selenium Grid – Run tests on multiple machines and browsers.

Installing Selenium in Python

```
pip install selenium
```

- Also download appropriate **WebDriver** (ChromeDriver, GeckoDriver, etc.)

PHP Script

First Selenium Script (Example)

```
from selenium import webdriver


driver = webdriver.Chrome()
driver.get("https://www.google.com")
print(driver.title)
driver.quit()
```

Locating Web Elements

- By ID: driver.find_element(By.ID, "id")
- By Name: driver.find_element(By.NAME, "name")
- By Class: driver.find_element(By.CLASS_NAME, "class")
- By Tag: driver.find_element(By.TAG_NAME, "tag")
- By XPath: driver.find_element(By.XPATH, "//tag[@attr='value']")
- By CSS Selector: driver.find_element(By.CSS_SELECTOR, "css")

Performing Actions

```
element.click()
element.send_keys("text")
element.clear()
```

Other actions:

- submit()
- get_attribute("value")

Handling Forms and Buttons

```
search_box = driver.find_element(By.NAME, "q")
search_box.send_keys("Selenium Python")
search_box.submit()
```

Waits in Selenium

- **Implicit Wait**:

```
driver.implicitly_wait(10)
```

- **Explicit Wait**:

```
from selenium.webdriver.support.ui import WebDriverWait
from selenium.webdriver.support import expected_conditions as EC

WebDriverWait(driver,
10).until(EC.presence_of_element_located((By.ID, "some_id")))
```

Handling Alerts

```
alert = driver.switch_to.alert
alert.accept()
alert.dismiss()
alert.text
```

Handling Frames and Windows

```
driver.switch_to.frame("frame_name")
driver.switch_to.default_content()

driver.switch_to.window("window_handle")
```

Taking Screenshots

```
driver.save_screenshot("screenshot.png")
```

Working with Cookies

```
driver.get_cookies()
driver.add_cookie({"name": "foo", "value": "bar"})
driver.delete_all_cookies()
```

Closing the Browser

```
driver.close()  # Closes the current tab
driver.quit()   # Quits the entire browser
```

Use Cases of Selenium

- Web Testing
- Web Scraping
- Automation Bots
- Form Submission
- Data Extraction

Best Practices

- Use explicit waits wisely.
- Avoid hard sleeps.
- Use try/except for error handling.
- Modularize code using functions/classes.
- Combine with testing frameworks like unittest or pytest.

Alternatives to Selenium

- Playwright
- Puppeteer (Node.js)
- BeautifulSoup (for static scraping)
- Scrapy (for scraping only)

Demo / Hands-on (Optional)

- Automate Google Search.
- Extract weather data.
- Automate login to a demo site

Resources

- https://selenium.dev
- Selenium with Python Docs
- ChromeDriver: https://sites.google.com/chromium.org/driver/