Consolidated Cheat Sheet: Selenium in Java, Python, and Cypress

SELENIUM SYNTAX AND SNIPPETS

1. Installing Required Tools

Topic	Java Code	Python Code	Cypress Command	Description
Install Selenium	N/A (Handled via Maven/Gradle)	pip install selenium	npm install cypress	Installation command for respective tools.
Install Browser	Download ChromeDriver/ GeckoDriver	Download ChromeDriver/ GeckoDriver	Not needed; built into Cypress	Browser driver setup for Java and Python.

2. Importing Libraries

Topic	Java Code	Python Code	Cypress Command	Description
Import Libraries	import org.openqa.selenium.*;	from selenium import webdriver	Import not required; auto-handled	Add necessary imports in Java and Python.

3. Invoking Browsers

Topic	Java Code	Python Code	Cypress Command	Description
Launch Chrome	WebDriver driver = new ChromeDriver();	from selenium import webdriver driver = webdriver.Chrome()	cy.visit('http://example.com');	Initialize Chrome browser for automation.
Launch Firefox	WebDriver driver = new FirefoxDriver();	from selenium import webdriver driver = webdriver.Firefox()	N/A	Initialize Firefox browser for automation.
Maximize Window	driver.manage().window().maximize();	driver.maximize_window()	Handled by default in Cypress	Ensure the browser window is maximized.

4. Basic Browser Operations

Topic	Java Code	Python Code	Cypress Command	Description
Navigate to URL	driver.get("http://example.com");	driver.get("http://example.com")	cy.visit('http://example.com');	Opens the specified URL.
Back Navigation	driver.navigate().back();	driver.back()	cy.go('back');	Navigates back in browser history.
Forward Navigation	driver.navigate().forward();	driver.forward()	cy.go('forward');	Navigates forward in browser history.
Refresh Page	driver.navigate().refresh();	driver.refresh()	cy.reload();	Refreshes the current browser page.

5. Locating Elements

Topic	Java Code	Python Code	Cypress Command	Description
By ID	driver.findElement(By.id("id"));	driver.find_element_by_id("id")	cy.get('#id');	Locate element by its ID.
By Name	driver.findElement(By.name("name"));	driver.find_element_by_name("name")	cy.get('[name="name"]');	Locate element by its name.
By XPath	driver.findElement(By.xpath ("//tag[@attr='value']"));	driver.find_element_by_xpath("//tag[@attr='value']")	cy.xpath('//tag[@attr="value"]');	Locate element using XPath expressions.

6. Interacting with Elements

Action	Java (Selenium)	Python (Selenium)	Cypress (JavaScript)
Open a URL	WebDriver driver = new ChromeDriver();driver.get("https://example.com");	from selenium import webdriver driver = webdriver.Chrome() driver.get("https://example.com")	cy.visit('https://example.com')
Find Element by ID	WebElement element = driver.findElement(By.id("elementID"));	element = driver.find_element(By.ID, "elementID")	cy.get('#elementID')
Click an Element	WebElement button = driver.findElement(By.id("submitButton")); button.click();	button = driver.find_element(By.ID, "submitButton") button.click()	cy.get('#submitButton').click()
Send Text to Input Field	WebElement input = driver.findElement(By.name("username")); input.sendKeys("myUsername");	input = driver.find_element(By.NAME, "username") input.send_keys("myUsername")	cy.get('input[name="username"]').type('myUsername')
Get Text of Element	WebElement textElement = driver.findElement(By.xpath("//h1")); String text = textElement.getText();	textElement = driver.find_element(By.XPATH, "//h1") text = textElement.text	cy.get('h1').invoke('text')
Check if Element is Visible	WebElement element = driver.findElement(By.id("elementID")); boolean isVisible = element.isDisplayed();	element = driver.find_element(By.ID, "elementID") isVisible = element.is_displayed()	cy.get('#elementID').should('be.visible')
Select Dropdown Option	WebElement dropdown = driver.findElement(By.id("dropdown")); Select select = new Select(dropdown); select.selectByVisibleText("Option 1");	from selenium.webdriver.support.ui import Select dropdown = driver.find_element(By.ID, "dropdown") select = Select(dropdown) select.select_by_visible_text("Option 1")	cy.get('#dropdown').select('Option 1')
Mouse Hover	Actions actions = new Actions(driver); WebElement element = driver.findElement(By.id("hoverElement")); actions.moveToElement(element).perform();	from selenium.webdriver.common.action_chains import ActionChainsactions = ActionChains(driver) element = driver.find_element(By.ID, "hoverElement") actions.move_to_element(element).perform()	cy.get('#hoverElement').trigger('mouseover')
Wait for Element to be Visible	WebDriverWait wait = new WebDriverWait(driver, 10); WebElement element = wait.until(ExpectedConditions.visibilityOfElementLocated(By.id("elementID")));	from selenium.webdriver.support.ui import WebDriverWait from selenium.webdriver.support import expected_conditions as EC wait = WebDriverWait(driver, 10) element = wait.until(EC.visibility_of_element_located((By.ID, "elementID")))	cy.get('#elementID').should('be.visible')
Get Element's Attribute Value	WebElement element = driver.findElement(By.id("inputField")); String value = element.getAttribute("value");	element = driver.find_element(By.ID, "inputField") value = element.get_attribute("value")	cy.get('#inputField').invoke('val')

7. Assertions

Assertion	Java Code	Python Code	Cypress Command	Description
Assert Equals	assertEquals(expected, actual); (JUnit)	assert expected == actual	expect(actual).to.equal(expected);	Checks if two values are equal.
Assert Not Equals	assertNotEquals(expected, actual); (JUnit)	assert expected != actual	expect(actual).not.to.equal(expected);	Checks if two values are not equal.
Assert True	assertTrue(condition); (JUnit)	assert condition	expect(condition).to.be.true;	Asserts that the condition is true.

Assert False	assertFalse(condition); (JUnit)	assert not condition	expect(condition).to.be.false;	Asserts that the condition is false.
Assert Null	assertNull(object); (JUnit)	assert object is None	expect(object).to.be.null;	Asserts that the object is null.
Assert Not Null	assertNotNull(object); (JUnit)	assert object is not None	expect(object).to.not.be.null;	Asserts that the object is not null.
Assert Array Size	assertEquals(expectedSize, array.length);	assert len(array) == expected_size	expect(array).to.have.length(expected_size);	Asserts that the array or collection has the expected size.
Assert List Size	assertEquals(expectedSize, list.size());	assert len(list) == expected_size	expect(list).to.have.length(expected_size);	Asserts that the list has the expected size.
Assert Contains	assertTrue(list.contains(element));	assert element in list	expect(list).to.include(element);	Asserts that an element is contained in the collection.
Assert Not Contains	assertFalse(list.contains(element));	assert element not in list	expect(list).to.not.include(element);	Asserts that an element is not contained in the collection.
Assert String Equals	assertEquals(expectedString, actualString);	assert expected_string == actual_string	expect(actual_string).to.equal(expected_string);	Asserts that two strings are equal.
Assert String Contains	assertTrue(actualString.contains(expectedSubstring));	assert expected_substring in actual_string	expect(actual_string).to.include(expected_substring);	Asserts that a string contains a specific substring.
Assert Exception	assertThrows(ExpectedException.class, () -> { /* code */ });	with pytest.raises(ExpectedException):# code	N/A	Asserts that a specific exception is thrown.
Assert Greater Than	assertTrue(actual > expected);	assert actual > expected	expect(actual).to.be.greaterThan(expected);	Asserts that the actual value is greater than the expected.
Assert Less Than	assertTrue(actual < expected);	assert actual < expected	expect(actual).to.be.lessThan(expected);	Asserts that the actual value is less than the expected.
Assert Object Equality	N/A	N/A	expect(actualObject).to.deep.equal(expectedObject);	Asserts that two JavaScript objects are deeply equal.

8. Advanced Concepts

Topic	**Java Code**	**Python Code**	**Cypress Command**	**Description**
Handling Alerts	driver.switchTo().alert().accept();	`alert = driver.switch_to.alert alert.accept()`	cy.on('window:alert', () => { ... })	Handle JavaScript alerts.
Handling Frames	driver.switchTo().frame("frameName");	driver.switch_to.frame("frameName")	cy.frameLoaded('iframeSelector')	Switch to a specific frame.
File Upload	driver.findElement(By.id("upload")).sendKeys("path"); `element = driver.find_element_by_id("upload")	element.send_keys("path")`	cy.get('#upload').attachFile('file.jpg');	Automate file uploads.
Taking Screenshots	`File screenshot = ((TakesScreenshot) driver).getScreenshotAs(OutputType.FILE); FileUtils.copyFile(screenshot, new File("path/to/screenshot.png"));`	driver.save_screenshot("screenshot.png")	cy.screenshot('screenshot')	Capture a screenshot of the browser.
Scroll to Element	((JavascriptExecutor) driver).executeScript("arguments[0].scrollIntoView(true);", element);	driver.execute_script("arguments[0].scrollIntoView(true);", element)	cy.get('selector').scrollIntoView();	Scrolls the page to bring a specific element into view.
Scroll by Pixels	((JavascriptExecutor) driver).executeScript("window.scrollBy(0,500);");	driver.execute_script("window.scrollBy(0,500);")	cy.scrollTo(0, 500);	Scrolls the page vertically by a specified pixel amount.
Scroll to Bottom	((JavascriptExecutor)driver).executeScript("window.scrollTo(0, document.body.scrollHeight);");	driver.execute_script("window.scrollTo(0, document.body.scrollHeight);")	cy.scrollTo('bottom');	Scrolls to the bottom of the page. Useful for lazy loading content.
Scroll to Top	((JavascriptExecutor) driver).executeScript("window.scrollTo(0, 0);");	driver.execute_script("window.scrollTo(0, 0);")	cy.scrollTo('top');	Scrolls to the top of the page.

Scroll Horizontally	((JavascriptExecutor) driver).executeScript("window.scrollBy(500,0);");	driver.execute_script("window.scrollBy(500,0);")	cy.scrollTo('right');	Scrolls horizontally by a specific amount.
Scroll Using Actions Class	new Actions(driver).scrollByAmount(0, 500).perform();	ActionChains(driver).scroll_by_amount(0, 500).perform()	*Not applicable; Cypress uses cy.scrollTo() instead*	Uses the **Actions class** to scroll, useful for interacting with scrollable elements.
Infinite Scroll Handling	while (true) { ((JavascriptExecutor) driver).executeScript("window.scrollTo(0, document.body.scrollHeight);"); Thread.sleep(1000); }	while True: driver.execute_script("window.scrollTo(0, document.body.scrollHeight);") time.sleep(1)	cy.scrollTo('bottom'); cy.wait(1000); (repeat as needed)	Simulates infinite scrolling by continuously scrolling to the bottom and waiting for new content to load.

9. Mouse Actions

Topic	Java Code	Python Code	Cypress Command	Description
Hover Over Element	Actions actions = new Actions(driver); actions.moveToElement(element).perform();	from selenium.webdriver.common.action_chains import ActionChainsactions = ActionChains(driver) actions.move_to_element(element).perform()	cy.get('#id').trigger('mouseover')	Simulate hovering over an element.
Double Click	Actions actions = new Actions(driver); actions.doubleClick(element).perform();	actions = ActionChains(driver) actions.double_click(element).perform()	cy.get('#id').dblclick()	Perform a double-click operation.
Drag and Drop	Actions actions = new Actions(driver);actions.dragAndDrop(source, target).perform();	actions = ActionChains(driver) actions.drag_and_drop(source, target).perform()	N/A	Simulate drag-and-drop actions.
File Upload via Mouse	N/A	actions.click_and_hold(element).perform()	N/A	Simulate file upload by dragging files.

10. Chrome options

Option	Java Code	Python Code	Cypress Command	Description
Disable Notifications	ChromeOptions options = new ChromeOptions();options.addArguments("--disable-notifications"); WebDriver driver = new ChromeDriver(options);	from selenium.webdriver.chrome.options import Optionsoptions = Options() options.add_argument("--disable-notifications") driver = webdriver.Chrome(options=options)	N/A	Disable browser notifications.
Headless Mode	ChromeOptions options = new ChromeOptions(); options.addArguments("--headless"); WebDriver driver = new ChromeDriver(options);	from selenium.webdriver.chrome.options import Optionsoptions = Options() options.add_argument("--headless") driver = webdriver.Chrome(options=options)	npx cypress run --headless	Run Chrome without a UI.
Set Proxy	ChromeOptions options = new ChromeOptions(); options.addArguments("--proxy-server=http://proxy.example.com:8080"); WebDriver driver = new ChromeDriver(options);	from selenium.webdriver.chrome.options import Optionsoptions = Options() options.add_argument("--proxy-server=http://proxy.example.com:8080") driver = webdriver.Chrome(options=options)	--proxy=http://proxy.example.com:8080	Set the browser's proxy server.
Disable GPU Hardware Acceleration	ChromeOptions options = new ChromeOptions(); options.addArguments("--disable-gpu"); WebDriver driver = new ChromeDriver(options);	from selenium.webdriver.chrome.options import Options options = Options() options.add_argument("--disable-gpu") driver = webdriver.Chrome(options=options)	N/A	Disable GPU hardware acceleration.
Disable Extensions	ChromeOptions options = new ChromeOptions(); options.addArguments("--disable-extensions"); WebDriver driver = new ChromeDriver(options);	from selenium.webdriver.chrome.options import Options options = Options()	N/A	Disable all browser extensions.

		options.add_argument("--disable-extensions") driver = webdriver.Chrome(options=options)		
Set Window Size	ChromeOptions options = new ChromeOptions(); options.addArguments("window-size=1200x600"); WebDriver driver = new ChromeDriver(options);	from selenium.webdriver.chrome.options import Options options = Options() options.add_argument("window-size=1200x600") driver = webdriver.Chrome(options=options)	"viewportWidth": 1200, "viewportHeight": 600	Set the initial window size of the browser.
Incorporate User Data	ChromeOptions options = new ChromeOptions(); options.addArguments("user-data-dir=/path/to/your/chrome/profile"); WebDriver driver = new ChromeDriver(options);	from selenium.webdriver.chrome.options import Options options = Options() options.add_argument("user-data-dir=<path>") driver = webdriver.Chrome(options=options)	N/A	Use a specific Chrome profile or user data.
Incognito Mode	ChromeOptions options = new ChromeOptions(); options.addArguments("--incognito"); WebDriver driver = new ChromeDriver(options);	from selenium.webdriver.chrome.options import Options options = Options() options.add_argument("--incognito") driver = webdriver.Chrome(options=options)	N/A	Open the browser in incognito (private browsing) mode.
Remote Debugging	ChromeOptions options = new ChromeOptions(); options.addArguments("--remote-debugging-port=9222"); WebDriver driver = new ChromeDriver(options);	from selenium.webdriver.chrome.options import Optionsoptions = Options() options.add_argument("--remote-debugging-port=9222") driver = webdriver.Chrome(options=options)	N/A	Enable remote debugging of the browser.
Disable Sandbox	ChromeOptions options = new ChromeOptions(); options.addArguments("--no-sandbox"); WebDriver driver = new ChromeDriver(options);	from selenium.webdriver.chrome.options import Optionsoptions = Options() options.add_argument("--no-sandbox") driver = webdriver.Chrome(options=options)	N/A	Disable the sandboxing feature for Chrome.

11. File Downloads

Topic	Java Code	Python Code	Cypress Command	Description

Automate Downloads	HashMap<String, Object> prefs = new HashMap<>();
	prefs.put("download.default_directory", "path/to/download");
	ChromeOptions options = new ChromeOptions();
	options.setExperimentalOption("prefs", prefs);
	WebDriver driver = new ChromeDriver(options);
		from selenium.webdriver.chrome.options
		
		import Options
		options = Options()
		prefs = {"download.default_directory": "path/to/download"}
		options.add_experimental_option("prefs", prefs)
		driver = webdriver.Chrome(options=options)
			N/A	Configures browser settings for file downloads.

Verify File Exists	Java File I/O APIs to check file existence at download location	import os assert os.path.exists("path/to/downloaded/file")	Use Node.js fs module for checking files	Validates that the file is downloaded successfully.

12. Using Service() Method in Python

Topic	Java Code	Python Code	Cypress Command	Description
Service Initialization	N/A	from selenium.webdriver.chrome.service import Service from selenium import webdriver service = Service("path/to/chromedriver") driver = webdriver.Chrome(service=service)	N/A	Demonstrates how to use Service() for initializing WebDriver.

13. Additional Chrome Options

Topic	Java Code	Python Code	Cypress Command	Description
Disable Notifications	ChromeOptions options = new ChromeOptions(); options.addArguments("--disable-notifications"); WebDriver driver = new ChromeDriver(options);	options = Options() options.add_argument("--disable-notifications") driver = webdriver.Chrome(options=options)	N/A	Suppresses browser notifications.
Start in Incognito	options.addArguments("--incognito"); WebDriver driver = new ChromeDriver(options);	options.add_argument("--incognito") driver = webdriver.Chrome(options=options)	N/A	Opens the browser in incognito mode.

EVERGREEN JAVASCRIPT SNIPPETS FOR AUTOMATION TESTING

Here are 20 evergreen **JavaScript snippets** that you can use in the `execute_script()` method in Selenium, along with their **usage**:

---

1. Click on an Element
JavaScript:
```
document.getElementById('element_id').click();
```
Usage: Clicks on an element with a specific `ID` (e.g., a button or a link).

---

2. Scroll to an Element
JavaScript:
```
document.getElementById('element_id').scrollIntoView();
```
Usage: Scrolls the page to bring the specified element into view.

---

3. Get the Page Title
JavaScript:
```
return document.title;
```
Usage: Retrieves the title of the current webpage.

---

4. Change the Value of an Input Field
JavaScript:
```
document.getElementById('input_id').value = 'new_value';
```
Usage: Changes the value of an input field (e.g., text box).

---

5. Get the Value of an Input Field
JavaScript:
```
return document.getElementById('input_id').value;
```
Usage: Retrieves the current value from an input field.

---

6. Submit a Form
JavaScript:
```
document.getElementById('form_id').submit();
```
Usage: Submits a form programmatically.

---

7. Get the Current URL
JavaScript:

```
return window.location.href;
```

Usage: Retrieves the current URL of the page.

---

8. Set a Cookie
JavaScript:

```
document.cookie = "cookie_name=cookie_value; path=/";
```

Usage: Sets a cookie in the browser.

---

9. Get All Cookies
JavaScript:

```
return document.cookie;
```

Usage: Retrieves all the cookies stored in the browser.

---

10. Disable JavaScript Alerts (Popups)
JavaScript:

```
window.alert = function() {};  // Disables alert popups
```

Usage: Disables JavaScript `alert()` popups on the page.

---

11. Highlight an Element (for Debugging)
JavaScript:

```
var element = document.getElementById('element_id');
element.style.border = '3px solid red';
```

Usage: Adds a red border around an element for debugging purposes.

---

12. Get All Links on a Page
JavaScript:

```
var links = document.getElementsByTagName('a');
var linkHrefs = [];
for (var i = 0; i < links.length; i++) {
    linkHrefs.push(links[i].href);
}
return linkHrefs;
```

Usage: Retrieves all the URLs of the links (`<a>` tags) on a page.

---

13. Remove an Element from the DOM
JavaScript:

```
var element = document.getElementById('element_id');
element.parentNode.removeChild(element);
```

Usage: Removes an element from the DOM.

---

14. Set the Window Size
JavaScript:

```
window.resizeTo(1024, 768);
```

Usage: Resizes the browser window to the specified dimensions (e.g., 1024x768).

---

15. Get the Window's Height and Width
JavaScript:

```
return [window.innerWidth, window.innerHeight];
```

Usage: Retrieves the width and height of the current window.

---

16. Change an Element's CSS Style
JavaScript:

```
document.getElementById('element_id').style.backgroundColor = 'blue';
```

Usage: Changes the background color of an element.

---

17. Scroll the Page to the Top
JavaScript:

```
window.scrollTo(0, 0);
```

Usage: Scrolls the page to the top.

---

18. Scroll the Page to the Bottom
JavaScript:

```
window.scrollTo(0, document.body.scrollHeight);
```

Usage: Scrolls the page to the bottom.

19. Trigger Mouse Hover on an Element

JavaScript:

```
var event = new MouseEvent('mouseover', { bubbles: true, cancelable: true });
document.getElementById('element_id').dispatchEvent(event);
```

Usage: Triggers a mouse hover event over a specified element.

---

20. Wait for an Element to be Visible

JavaScript:

```
return document.querySelector('#element_id').offsetParent !== null;
```

Usage: Checks if an element is visible on the page.

These JavaScript snippets can be executed in the browser's context using `execute_script()` and are widely used for interacting with web pages. They can be used for tasks such as clicking elements, manipulating styles, scrolling, retrieving information, and disabling popups, among others.