

◆ Automation Testing with Selenium, Java & Cucumber – Complete Content

1. Testing Fundamentals

- What is Software Testing?
 - Manual Testing vs Automation Testing
 - SDLC & STLC
 - Types of Testing
 - Functional
 - Regression
 - Smoke & Sanity
 - System, Integration, UAT
 - Test Case vs Test Scenario
 - Bug Life Cycle
 - Test Plan & Test Strategy
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2. Core Java for Automation

Java Basics

- JVM, JRE, JDK
- Data Types
- Variables
- Operators
- Control Statements

OOP Concepts (VERY IMPORTANT)

- Class & Object
- Inheritance
- Polymorphism
- Encapsulation
- Abstraction

Advanced Java

- Constructors
- `this` & `super`
- Access Modifiers
- Arrays
- Collections

- List, Set, Map
 - ArrayList, HashMap
 - Exception Handling
 - Java 8 Features
 - Lambda
 - Streams
 - Functional Interfaces
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3. Maven & Project Setup

- What is Maven?
 - Maven Lifecycle
 - pom.xml
 - Dependencies
 - Surefire & Failsafe Plugins
 - Project Structure for Automation
 - Running tests using Maven commands
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4. Selenium Basics

Selenium Overview

- What is Selenium?
- Selenium Architecture
- Selenium Components
 - Selenium WebDriver
 - Selenium Grid

Browser Drivers

- ChromeDriver
 - EdgeDriver
 - FirefoxDriver
 - WebDriverManager
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5. Selenium WebDriver – Core Concepts

WebDriver Methods

- `get()`, `navigate()`
- `findElement()` vs `findElements()`
- `click()`, `sendKeys()`

- `getText()`, `getAttribute()`

Locators (VERY IMPORTANT)

- ID
 - Name
 - ClassName
 - TagName
 - LinkText & PartialLinkText
 - CSS Selector
 - XPath (Absolute & Relative)
 - Dynamic XPath
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6. Handling Web Elements

- Buttons
 - Text Boxes
 - Radio Buttons
 - Checkboxes
 - Drop-downs (`Select` class)
 - Auto-suggestions
 - Hidden elements
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7. Advanced Selenium

Wait Mechanisms

- Implicit Wait
- Explicit Wait
- Fluent Wait

Handling Special Scenarios

- Alerts
 - Frames
 - Windows & Tabs
 - File Upload & Download
 - Mouse Actions (`Actions` class)
 - Keyboard Actions
 - JavaScriptExecutor
 - Taking Screenshots
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8. Page Object Model (POM)

- What is POM?
 - Advantages of POM
 - Page Class Design
 - Page Factory
 - Reusable Methods
 - Base Class Implementation
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9. TestNG Integration

- Why TestNG?
 - Annotations
 - Assertions
 - Groups
 - Priority
 - Parallel Execution
 - DataProvider
 - Listeners
 - Retry Analyzer
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10. Cucumber – BDD Framework

BDD Basics

- What is BDD?
- BDD vs TDD
- Gherkin Language

Gherkin Keywords

- Feature
 - Scenario
 - Scenario Outline
 - Given / When / Then
 - And / But
 - Examples
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11. Cucumber with Selenium & Java

Cucumber Setup

- Dependencies
- Project Structure
- Feature Files
- Step Definition Classes

Cucumber Annotations

- @Given
- @When
- @Then
- @Before
- @After

Glue Code

- Hooks
 - Tags
 - Background
 - Parameterization
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12. Data-Driven Testing

- Using Examples in Cucumber
 - Reading data from:
 - Excel (Apache POI)
 - Properties file
 - JSON
 - Passing parameters from feature file
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13. Framework Design (REAL-TIME)

Hybrid Framework

- Selenium
- Java
- Cucumber
- TestNG
- Maven
- POM
- Utilities

Framework Structure

```
src/test/java
├── base
```

```
|— pages
|— stepdefinitions
|— runners
|— utils
|— hooks
```

```
src/test/resources
```

```
|— features
|— config
|— testdata
```

14. Cucumber Runner

- JUnit Runner
 - TestNG Runner
 - Tags execution
 - Parallel execution
 - Dry run
 - Strict mode
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15. Reporting

- Cucumber HTML Reports
 - Extent Reports
 - Allure Reports
 - Screenshot attachment on failure
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16. Selenium Grid & Parallel Execution

- Selenium Grid Architecture
 - Hub & Node
 - Grid setup
 - Parallel execution with TestNG
 - Cross-browser testing
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17. CI/CD Integration

- Jenkins overview
- Jenkins pipeline for automation
- Git integration
- Scheduling test execution
- Email reports

18. Cloud Testing Tools (Overview)

- BrowserStack
- Sauce Labs
- LambdaTest

19. Best Practices

- Writing reusable code
- Proper waits usage
- Avoid Thread.sleep
- Page Object principles
- Logging (Log4j)
- Exception handling
- Code optimization

20. Interview Preparation

Selenium

- findElement vs findElements
- Implicit vs Explicit Wait
- XPath vs CSS
- Selenium limitations

Cucumber

- Feature vs Scenario
- Scenario Outline
- Hooks
- Tags

Framework

- Why POM?
- Hybrid framework
- CI/CD role in automation

21. Real-Time Automation Project

Sample Project

E-Commerce Application

- Login
- Product Search
- Add to Cart
- Checkout
- Logout

Tools Used

- Selenium
- Java
- Cucumber
- TestNG
- Maven
- Jenkins

22. Resume & Career Tips

- How to mention Automation Framework in resume
- Real-time project explanation
- Common interview mistakes