# QA Automation Engineer Training 2025

## 1. Core Java Essentials

### Environment Setup

- Installing JDK, JRE, and IntelliJ
- Maven Project creation and structure
- Understanding packages and folder structure

### Java Fundamentals

- Classes, Objects, Methods, Access Modifiers
- main() method explanation
- Naming conventions, Data types, Operators
- Control statements and Loops
- Input/Output, Arrays, Strings

### Object-Oriented Programming (OOP)

- Constructors
- static, this, and super keywords
- Abstraction
- Encapsulation
- Inheritance
- Polymorphism
- Interfaces and Abstract Classes
- Type Casting
- Exception Handling
- Wrapper Classes

### Collections Framework

- Overview: List, Set, Map
- Key differences: Collection vs Collections
- Interview questions and hands-on practice

### Java 8+ Features

- Lambda Expressions
- Stream API
- Functional Interfaces

### Logic Building

Miscellaneous programming challenges and exercises

## 2. Testing Fundamentals

### Software Testing Basics

- STLC overview
- Manual vs Automation Testing
- Testing Levels: Unit, Integration, System, Acceptance
- Functional vs Non-Functional Testing
- Testing Techniques

### Test Documentation

- Test Plan, Test Strategy
- Test Scenarios, Test Cases, Test Data
- RTM (Requirement Traceability Matrix)

### Defect Lifecycle

- Defect/Bug definition
- Priority vs Severity
- Defect Reporting

### Test Execution & Reporting

- Execution process
- Bug logging and tracking
- Test Summary Report
- Best Practices

### Additional Concepts

- Exploratory Testing
- Effective Communication

# 3. Automation Testing with Selenium

## Automation Overview

- What & Why of Automation Testing
- Popular Tools: Selenium WebDriver, Cypress, Playwright

## Selenium WebDriver Basics

- WebDriver architecture and browser drivers
- Setting up UI test automation

## Core Concepts

- WebDriver methods
- Locators: ID, Name, XPath, CSS
- Stable XPath and CSS selector creation
- Handling UI elements: TextBoxes, Buttons, Dropdowns, etc.

## Advanced Selenium

- Synchronization: Implicit vs Explicit Waits
- Mouse & Keyboard Actions
- Working with Alerts, Windows, Tabs, Frames
- Scrolling using JavaScriptExecutor
- Screenshot capture
- Excel Integration for data-driven testing

## Test Framework with TestNG

- Installation & Setup
- Annotations and test configuration (testng.xml)
- Assertions (Soft vs Hard)
- DataProvider and Parameterization
- Listeners, Rerun Failed Tests
- Parallel Test Execution

## Version Control

- Git & GitHub: Setup, Configuration
- Common Git commands
- Branching and Merging
- Project collaboration via GitHub

## Framework Development

- Project Structure (Maven)
- Utility and Base Classes

- Page Object Model (POM) & PageFactory
- Reusable UI methods
- Extent Reports Integration
- OOP principles in frameworks

## CI/CD Integration
- GitHub Actions for test execution
- Automation workflow setup
- Code reviews and refactoring best practices

## BDD with Cucumber
- Installation & Setup
- Step Definitions, Feature Files
- Scenarios, Scenario Outline, Data Tables
- Test Runner configuration

# 4. API Testing with Rest Assured

## API Fundamentals
- HTTP Methods: GET, POST, PUT, DELETE, PATCH
- PUT vs PATCH
- Base URL vs Endpoint with examples
- Path vs Query Parameters
- Status Codes overview

## Rest Assured Basics
- Required dependencies
- Principles of BDD with Rest Assured
- Performing CRUD operations (GET, POST, etc.)

## Advanced API Automation
- Verifying JSON responses
- Extracting nested JSON attributes
- Authentication & Authorization
- Parameterizing JSON payloads
- Framework structure and components
- Handling test failures

# 5. Miscellaneous Topics
- Test Strategy, Planning, and Estimation

- Agile Methodology & JIRA
- Real-world challenges in UI/API automation
- AI Copilot tools in testing (e.g., code generation, test maintenance)
- Assignments & Projects
- Mock Interviews & Resume Building
- Job Placement Assistance