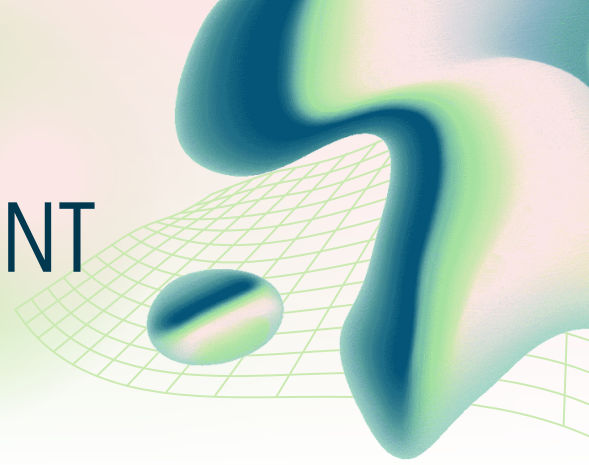


# MASTERING MODERN SOFTWARE DEVELOPMENT

A Comprehensive Guide to Java, Automation, and API Testing



## Core Java

### Introduction to Java

- Introduction to Java
- History of Java
- Important Features of Java

### Java Development Kit (JDK), Java Runtime Environment (JRE), and Java Virtual Machine (JVM)

- JDK 1.8, JRE, and JVM

### Basic Java Concepts

- Java Keywords
- Java Flow Control
- Source File
- Class and Objects
- Data Types
  - Primitive Data Types
  - Non-Primitive Data Types
- Constructor
- Packages
- Instance & Static Variable
- Static Block
- Has-A Relation (secondary Reference)
- Setter and Getter
- Method Return Type (primitive type and class type)

### Object-Oriented Programming (OOP)

- Inheritance (Is-a)
- Constructor and Inheritance

- Covariant Return Types
- Inheritance and Type Casting
- This/Super Keyword
- Polymorphism
  - Method Overloading
  - Constructor Overloading
  - Compile-Time Polymorphism
  - Overloading and Narrowing Concept
  - Method Overriding
  - @Override Annotation
  - Overriding and toString() Method
- Abstraction
  - Abstract Class
  - Interface
  - Marker Interface
  - Interface Uses and Benefit with Example
  - Difference Between Interface and Abstract Class
- Encapsulation
  - Access Modifier
  - Data Hiding
  - Protected Access Modifier Implementation

## Exception Handling

- Exception Handling
- Try and Catch Block
- Multiple Catch Blocks
- Nested Try
- Finally Block
- Finally Block with Return Statement
- Throw Keyword
- Exception Propagation
- Throws Keyword
  - Throws Keyword with Method Overriding
  - Throws Keyword with Constructor
- Custom Exception
  - Throw Keyword and Custom Exception
- JDK 1.7 Feature Autocloseable Interface
- JDK 1.7 Feature Try with Resources

## Java 8 Features

- Java 8 Interface Default Method
- Java 8 Interface Static Method
- Java 8 Functional Interface
- Java 8 Lambda Expression

- Java 8 forEach() Method
- Java 8 Stream API
- Java 8 Collection

## String Handling

- String: What and Why?
- Immutable String
- Methods of String Class
- Creating Immutable Class

## Collection Framework

- Java Collection
- Java List
  - ArrayList, Vector, LinkedList
  - Nested List
  - List and Duplicate
- Java Set
  - HashSet, TreeSet, LinkedHashSet
- Map
  - HashMap, TreeMap, LinkedHashMap
- Cursors
  - Iterator, List Iterator
  - Enumeration
- Java Collections (Utility Class)
- Comparable & Comparator
  - Custom Sorting
  - Difference Between Comparable and Comparator
- Collection and Generics

## Multithreading

- Introduction
- Extends Thread Class
- Implementing Runnable Interface and Callable Interface
- Thread Life Cycle
- Thread Methods (sleep, join, yield, etc.)

## Input/Output

- File
- File Writer & File Reader
- Buffered Writer
- Buffered Reader
- Input from Keyboard by Console
- Input from Keyboard by Scanner Class

- Print Writer Class
- Reading and Writing Data Simultaneously

## **Synchronization**

- Synchronization: What and Why?
- Synchronized Method
- Synchronized Block
- Static Synchronization

## **Logic Building**

# **SQL**

## **Database Introduction**

- SQL Introduction
- MYSQL Introduction
- MYSQL Installation
- MYSQL Workbench Installation Features
- Data Types

## **SQL Commands**

- DDL, DML, TCL
- Create Table
- Select Statement
- Insert Into Query
- Delete Query
- Update Query
- WHERE Clause
- ORDER BY Clause
- GROUP BY Clause

## **SQL Joins**

- SQL JOINS
  - SQL Outer Join
  - SQL Inner Join
  - SQL Left Join
  - SQL Right Join
  - SQL Full Join

## **Stored Procedure**

# Automation Testing

## Introduction to Automation Testing

- What is Automation Testing?
- Which Test Cases to Automate?
- Different Automation Tools
- Automation Challenges & Mitigations

## Introduction to Selenium

- What is Selenium?
- History and Various Versions of Selenium
- Advantages of Using Selenium Over Other Tools
- Selenium Components

## Selenium WebDriver

- What is a Driver?
- What is a Selenium WebDriver?
- Automation Setup for Selenium WebDriver
- Configuration of Selenium Jar Using Eclipse
- WebDriver Interface Methods

## HTML

- HTML Basics

## Locators

- Use of Locators
- Different Locators Available in Selenium
  - ID
  - Name
  - Link Text
  - Partial Link Text
  - Class Name
  - Tag Name
  - XPath
    - Absolute XPath
    - Relative XPath
    - Dynamic XPath
  - CSS

## Web Element

- Search Web Elements on Web Pages
- Web Element Methods

## **Synchronizing Test with Wait**

- Implicit Wait
- Explicit Wait
- Fluent Wait with Examples

## **Action Interface and Actions Class**

- Introduction
- Use of Action Class
- Action Class Methods with Description
- Building a Series of Multiple Actions

## **Miscellaneous Selenium Scenarios**

- Capturing Screenshots
- Alert and Pop-up Handling
- Calendar Handling
- Frames Handling
- Cookies
  - Why We Handle Cookies in Selenium?
  - Cookies Methods
- Multiple Window Handling
- JavaScript Injection

## **Handling Web Table**

- What is Web Tables?
- Extracting Values from Web Tables
  - Static and Dynamic Web Tables

## **Excel Sheet Operations**

- Introduction
- Read and Write Excel Sheet with .xls & .xlsx
- Format by Using Apache

## **TestNG**

- TestNG & TestNG Features
- How to Integrate TestNG with Eclipse
- TestNG Annotations
- Use of DataProvider Annotation
- Parameterization by Using testing.xml File

- POM File Parameterization by Using Data Provider
- TestNG Assertions
- TestNG Listeners

## **Build Tools - Maven**

## **Framework Designing**

- What is a Framework?
- Different Types of Framework
- How to Design a Framework?

## **Properties File**

## **Page Object Model**

- Introduction
- Advantages of POM
- How to Implement POM Using Page Object and Page Factory by Using Selenium WebDriver

## **Log4j**

## **Jenkins**

- What is Jenkins and How to Use It?
- Integration of Maven/TestNG/Jenkins/Selenium

## **Auto IT**

- Introduction
- Download File Using Auto IT in Selenium WebDriver with Example

## **Behavior Driven Development (BDD) Framework Using Cucumber**

- What is BDD?
- Use of Cucumber Tool to Implement BDD Framework
- Given, When, Then, And, But Annotations and Usage in Features Class
- Writing a Step Definition
- Writing Runner Class
- Passing Parameters in Step Functions
- Cucumber Annotations
- Data Table in Cucumber and Its Implementation
- Pretty, Tags, and Glue
- Generating JUnit

## Image Verification Tool

- Sikuli

## Source Code Management Tool

- GitHub

# API Testing

## Introduction to API and Web Services

- What is API?
- What is API Testing?
- What is Web Services?
- Types of Web Services

## HTTP Methods

- GET/POST/PUT/Delete
- HTTP Status Response Code

## ARC (Advanced REST Client)

- Introduction
- How to Call REST API in ARC
- CRUD Operation with All HTTP Methods

## Rest Assured

- Introduction
- Rest Assured Methods: GET/POST/PUT/Delete
- Integration with TestNG
- Assertions in Rest Assured
- Rest Assured Authentication Handle - Basic Auth

## Postman

- Introduction
- How to Call REST API in Postman
- How to Pass Path Parameter in Request
- How to Set Headers in Postman
- How to Pass JSON/XML Payload
- How to Check Response Status Code
- What is Response Header?



- API History in Postman
- Generate HTML Test Report
- Create a Collection from API Specification or API Schema
- Test Script in Postman
- Pre Request Script in Postman