**Selenium Automation Framework with Maven, TestNG, and CI/CD Pipeline**

**Table of Contents**

1. **Introduction**

* Purpose of the Framework
* Technologies Used

1. **Prerequisites**

* Tools and Software Requirements
* Basic Knowledge of Selenium WebDriver, Java, Maven, and TestNG

1. **Setting Up the Project**

* Creating a Maven Project
* Adding Dependencies

1. **Creating Test Scripts with TestNG**

* Creating Test Classes
* Writing Test Methods
* Running Tests

1. **Implementing Page Object Model (POM)**

* Creating Page Classes
* Interaction with Web Elements
* Reusability and Maintainability

1. **Test Data Management**

* Storing Test Data
* Data-Driven Testing

1. **Handling Configuration**

* Configuring TestNG Suite
* External Configuration Files (Properties, YAML, JSON)

1. **Logging and Reporting**

* Implementing Logging
* TestNG Reports and Custom Reporting
* Logging Tools (Log4j, Extent Reports)

1. **Parallel Test Execution**

* Configuring TestNG for Parallel Execution
* Thread Safety and Handling

1. **Continuous Integration and Continuous Deployment (CI/CD)**

* Setting up CI/CD Pipeline (e.g., Jenkins, Circle CI)
* Automating Test Execution
* Triggering Tests on Code Push

1. **Version Control**

* Using Git for Source Code Management
* Creating Branches and Merging Code

1. **Best Practices and Tips**

* Test Code Organization
* Naming Conventions
* Error Handling
* Test Maintenance

1. **Testing on Different Browsers and Platforms**

* Cross-Browser Testing
* Cloud Testing Services (e.g., Selenium Grid)

1. **Scaling the Framework**

* Handling Large Test Suites
* Performance and Load Testing Integration

1. **Troubleshooting and Debugging**

* Identifying and Resolving Common Issues
* Debugging Techniques

1. **Training and Documentation**

* Onboarding New Team Members
* Maintaining Documentation

1. **Conclusion**

* Future Enhancement