UNIVERSITY OF ZIMBABWE

FACULTY OF COMPUTER ENGINEERING INFORMATICS AND COMMUNICATIONS

COMPUTER ENGINEERING DEPARTMENT

SOFTWARE TESTING AND QUALITY ASSURANCE HCE 412

Group Assignment 1: Testing a Web-Based E-Commerce Application

Objective:
The goal of this assignment is for your group to design and execute tests for a real-world web-based e-commerce application.

Tasks:

1. Choose a publicly available e-commerce platform (e.g., Amazon, eBay, or a similar site).
2. Identify key functionalities, such as search, product selection, adding items to the cart, and checkout.
3. Design test cases for each of the identified functionalities using black-box testing techniques (e.g., equivalence partitioning, boundary value analysis).
4. Execute the tests manually, document the results, and report any defects found.
5. Prepare a final report summarizing your testing strategy, test execution, and defect tracking process. Include any recommendations for improving the quality of the platform.

Deliverables:

- Test case design document
- Defect report with screenshots and descriptions
- Final report with recommendations

Group Assignment 2: Automating Regression Tests for a Mobile Application

Objective:
This assignment requires your group to create an automated regression test suite for a mobile application using a test automation tool such as Appium or any other mobile testing tool.

Tasks:

1. Choose a mobile application (available on Android or iOS) that your group will use for testing.
2. Identify core functionalities that need regression testing, such as login, navigation, and form submission.
3. Develop automated test scripts to cover these functionalities, ensuring that the scripts are repeatable and can be integrated into a continuous integration (CI) pipeline.
4. Execute the automated tests and document the results.
5. Prepare a final report explaining the automation framework used, the test scripts, the execution results, and any challenges encountered during automation.

Deliverables:

- Automated test scripts
- Execution report with results
- Final report documenting the automation framework and process

Group Assignment 3: Performance Testing of a Web Application

Objective:
Your group will conduct performance testing for a web application to evaluate its behavior under different levels of load.

Tasks:

1. Select a publicly available web application (e.g., a blog site, news site, or social media platform).
2. Define performance metrics to measure, such as response time, throughput, and error rate.
3. Use a performance testing tool (e.g., JMeter, LoadRunner) to simulate different levels of user load.
4. Analyze the performance of the application under varying load conditions, and identify any bottlenecks.

5. Create a report that includes the performance metrics, the results of the load tests, and recommendations for improving the application's performance.

Deliverables:

- Performance test scripts
- Performance testing report with analysis
- Recommendations for performance improvement

Group Assignment 4

Security Testing for a Web-Based Application

Objective:
This assignment involves performing security testing on a web-based application to identify potential vulnerabilities.

Tasks:

1. Choose a publicly available web application with user authentication functionality (e.g., login forms, user registration).
2. Identify common security vulnerabilities such as SQL injection, cross-site scripting (XSS), and weak password policies.
3. Perform security testing using both manual techniques and automated tools (e.g., OWASP ZAP, Burp Suite).
4. Document any security vulnerabilities found and suggest remediation strategies.
5. Prepare a report summarizing your testing approach, findings, and recommendations for securing the application.

Deliverables:

- Security test cases
- Vulnerability report with remediation suggestions
- Final report documenting the security testing process and results

Group Assignment 5

Quality Assurance for a New Software Release

Objective:
Your group will act as a quality assurance (QA) team responsible for ensuring the quality of a new software release.

Tasks:

1. Choose a small open-source software project that is preparing for a new release (e.g., a GitHub repository with an upcoming version).
2. Review the project's release notes and identify the new features and bug fixes.
3. Develop a test plan that covers functional, non-functional, and regression testing for the new release.
4. Execute the tests, document the results, and report any defects found.
5. Prepare a final quality assurance report that includes the test plan, test results, and a recommendation on whether the software is ready for release.

Deliverables:

- Test plan covering various testing types
- Defect report
- Final QA report with release recommendations

Group Assignment 6

Continuous Integration and Continuous Delivery (CI/CD) Pipeline Implementation

Objective:
Your group will implement a CI/CD pipeline for a software project, integrating automated testing and quality checks.

Tasks:

1. Choose an open-source project or create a small software project that your group will use for this assignment.
2. Set up a CI/CD pipeline using tools like Jenkins, GitLab CI, or GitHub Actions.
3. Integrate unit testing, automated functional testing, and code quality checks (e.g., linting, static analysis) into the pipeline.
4. Run the pipeline to ensure that it triggers automatically on code changes and provides feedback to developers.
5. Prepare a report documenting the setup process, the pipeline configuration, and the results of running the pipeline.

Deliverables:

- CI/CD pipeline configuration files
- Report documenting the pipeline setup and results
- Recommendations for improving the CI/CD process