Individual Assignment

Title: Comprehensive Web Application Performance Testing & Analysis

Objective:

To design, execute, and critically analyze a performance test plan for a web application using a specialized testing tool, thereby demonstrating the ability to interpret key performance indicators (KPIs) and document technical findings effectively for a professional audience.

Requirement:

Each student must select a unique combination of:

1. **Performance Testing Tool:** (e.g., Apache JMeter, K6, Artillery, LoadRunner, etc.)
2. **Performance Testing Type:** (e.g., Load Test, Stress Test, Soak Test, Spike Test)
3. **Target Web Application:** A publicly accessible web application (must be pre-approved by the instructor to ensure legality and ethical use).

Activity:

1. **Individual** (This is a solo assignment. No collaboration on execution or documentation is permitted. Article must publish at Github)
2. **Select** a unique performance testing tool and a suitable public web application target.
3. **Formulate** a hypothesis regarding the application's performance stability and expected bottlenecks under high user load.
4. **Execute** a minimum of three distinct types of performance tests (e.g., Load Test, Stress Test, and Soak Test) using the chosen tool, ensuring test scenarios simulate realistic user behavior and load profiles.
5. **Analyze** the data collected from the tests, including key metrics such as response time, throughput, error rate, and resource utilization (CPU/Memory).
6. **Interpret** the results to identify critical performance bottlenecks, failure points, and

areas for application optimization.

7. **Compose** a detailed, professional technical article (minimum 1,500 words) on a GitHub repository. This article must thoroughly document:
    - Tool selection justification.
    - Test environment setup and methodology.
    - Raw data presentation (e.g., charts/graphs).
    - Interpretation of results and identified bottlenecks.
    - Recommendations for improvement and final conclusions.
8. **Demonstrate** the test execution process, key configuration steps, and a walkthrough of the most significant test results in a focused video presentation. Upload this video to YouTube and embed the link prominently in the GitHub article.
9. **Justify** the overall test plan, tool choice, and final performance recommendations based on industry best practices and the empirical evidence gathered during the testing cycles.
10. **Due** on Week 4.