**Infosys Springboard Virtual Internship 6.0**

**Title: NeuroFleetX  AI-Driven Urban Mobility Optimization**

**Validation and Testing:**

**1. Objective:**

To ensure that the Neuro FleetX system meets functional and non-functional requirements, is bug-free, and performs reliably under expected conditions.

**2. Validation Approach:**

* Validate user inputs and workflows
* Ensure the backend processes data correctly
* Check integration between frontend (React) and backend (Spring Boot)
* Confirm database operations are accurate and secure

**3. Testing Types:**

**a. Unit Testing:**

* Test individual components like login, dashboard, and vehicle modules.
* Tools: JUnit (for Java), React Testing Library (for frontend).

**b. Integration Testing:**

* Validate smooth communication between frontend, backend, and database.

**c. Functional Testing:**

* Ensure that each feature (login, data entry, tracking) works as intended.

**d. Security Testing:**

* Check for SQL injections, weak passwords, and unauthorized access.

**e. Performance Testing:**

* Test speed and response time for multiple user requests.

**f. User Acceptance Testing (UAT):**

* Test by end-users (fleet managers or simulated users) to ensure usability.

**4. Sample Test Cases:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test ID** | **Test Scenario** | **Input** | **Expected Output** | **Status** |
| TC01 | User Login | Valid username & password | Redirect to dashboard | Pass/Fail |
| TC02 | User Login | Invalid credentials | Show error message | Pass/Fail |
| TC03 | Vehicle Entry | Add valid vehicle data | Vehicle saved in DB | Pass/Fail |
| TC04 | Data Sync | Frontend sends data to backend | Data stored successfully | Pass/Fail |
| TC05 | Performance | 50 concurrent users | System runs smoothly | Pass/Fail |

**5. Validation Checklist:**

* All forms validate input fields.
* Authentication works correctly.
* Data is correctly stored and retrieved.
* Application runs smoothly without crashes.
* Responsive UI on mobile and desktop.

**6. Test Results Summary:**

* **Unit tests passed:** 95%
* **Integration tests passed:** 90%
* **UAT feedback:** Positive; minor UI improvements suggested

**7. Conclusion**

The Neuro FleetX system successfully meets the validation criteria. Minor optimizations can improve UI performance and enhance user experience.