Date	Name	ID	Role	Activity	Ratio	Mark
07/10/2024	Md. Rajuan Hossain	221002100	L	Non-Fucntional	60%	9
	Hasebul Hasan	221002104	M	Functional	40%	9

Functional and Non-Functional Requirements for the AI-Driven Vehicle Tracking System

1. Functional Requirements (FRs)

1. **FR-01: Real-time Vehicle Tracking**
    - The system shall track vehicle location in real-time using GPS sensors and display the current position on a map.
    - **Priority:** High
    - **Acceptance Criteria:** Vehicle location should be updated on the map every 10 seconds.
2. **FR-02: Predictive Maintenance Alerts**
    - The system shall predict vehicle maintenance needs by analyzing data from sensors (e.g., engine status, fuel consumption).
    - **Priority:** High
    - **Acceptance Criteria:** An alert is generated when a potential maintenance issue is detected, with at least 90% accuracy based on historical data.
3. **FR-03: Route Optimization**
    - The system shall provide optimized routes for fleet vehicles based on real-time traffic conditions and previous route data.
    - **Priority:** High
    - **Acceptance Criteria:** Suggested routes should improve travel time by at least 10% compared to standard routes.
4. **FR-04: Driver Behavior Monitoring**
    - The system shall analyze driving behavior (e.g., speeding, harsh braking) and generate reports for fleet managers.
    - **Priority:** Medium
    - **Acceptance Criteria:** Reports should accurately reflect driver behavior and include metrics like average speed and instances of aggressive driving.
5. **FR-05: Web-based Dashboard**
    - The system shall provide a web-based dashboard for fleet managers to view real-time vehicle data, maintenance alerts, and performance reports.
    - **Priority:** High

    - **Acceptance Criteria:** The dashboard should load within 2 seconds and display data with real-time updates.
6. **FR-06: Geofencing and Alerts**
    - The system shall allow fleet managers to set geographic boundaries (geofences) for vehicles and send alerts if a vehicle leaves or enters a designated area.
    - **Priority:** Medium
    - **Acceptance Criteria:** Alerts are sent within 5 seconds of a vehicle crossing the geofence boundary.

2. Non-Functional Requirements (NFRs)

1. **Performance:**
    - **NFR-01: System Response Time**
        - The system should have a response time of less than 3 seconds for retrieving and displaying real-time vehicle data on the dashboard.
        - **Related FR:** FR-05 (Web-based Dashboard)
        - **Priority:** High
        - **Acceptance Criteria:** Load tests confirm that dashboard updates occur within 3 seconds under normal load conditions.
2. **Scalability:**
    - **NFR-02: Concurrent Users Support**
        - The system should support up to 10,000 concurrent users without performance degradation.
        - **Related FR:** FR-01 (Real-time Vehicle Tracking)
        - **Priority:** Medium
        - **Acceptance Criteria:** Performance tests show consistent system behavior with up to 10,000 users.
3. **Availability:**
    - **NFR-03: Uptime**
        - The system should be available 99.9% of the time, ensuring minimal downtime.
        - **Related FR:** All features
        - **Priority:** High
        - **Acceptance Criteria:** Uptime is monitored, and system downtime does not exceed 0.1% over a year.
4. **Security:**
    - **NFR-04: Data Encryption**
        - All sensitive data, including vehicle data and driver behavior logs, should be encrypted using AES-256 encryption.
        - **Related FR:** FR-01 (Real-time Vehicle Tracking), FR-04 (Driver Behavior Monitoring)
        - **Priority:** High

        - **Acceptance Criteria:** Data encryption is verified during security testing.
5. **Usability:**
    - **NFR-05: User Interface Simplicity**
        - The dashboard interface should be intuitive and require no more than 30 minutes of training for fleet managers.
        - **Related FR:** FR-05 (Web-based Dashboard)
        - **Priority:** Medium
        - **Acceptance Criteria:** Usability testing shows that new users can operate the dashboard within 30 minutes.
6. **Reliability:**
    - **NFR-06: Data Backup and Recovery**
        - The system shall automatically back up data every hour and support full data recovery within 30 minutes in case of system failure.
        - **Related FR:** FR-01 (Real-time Vehicle Tracking), FR-02 (Predictive Maintenance Alerts)
        - **Priority:** High
        - **Acceptance Criteria:** Backups occur hourly, and recovery tests show complete data restoration within 30 minutes.
7. **Efficiency:**
    - **NFR-07: Resource Usage**
        - The system should utilize serverless architecture to ensure cost-effective processing of large datasets.
        - **Related FR:** FR-02 (Predictive Maintenance Alerts), FR-03 (Route Optimization)
        - **Priority:** Medium
        - **Acceptance Criteria:** Serverless architecture keeps cloud costs within 10% of the budget.