Project Design Phase-II
Solution Requirements (Functional & Non-functional)

Date	31 January 2025
Team ID	LTVIP2025TMID51738
Project Name	Visualization Tool for Electric Vehicle Charge and Range Analysis
Maximum Marks	4 Marks

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Trip & Range Simulation	Accept user input for origin, destination, vehicle model, and driving style Calculate real-time range based on terrain, weather, and battery status Suggest optimal charging stops with ETA, cost, and charger type
FR-2	Battery Health Monitoring	Display current battery state of health (SoH) and charge cycles Alert users to degradation trends and suggest best charging practices
FR-3	Charging Station Discovery	Show nearby chargers with filters for speed, connector type, availability, and pricing Integrate real-time data from multiple charging networks Allow users to rate, or report charger issues
FR-4	Cost & Savings Tracker	Track electricity usage and charging costs (home and public). Compare total cost of ownership vs. ICE vehicles
FR-5	Offline Mode Support	Cache recent routes, charger data, and user preferences Allow trip planning and charging even without internet

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Performance**	The dashboard should load within **2 seconds** under normal network conditions. It must support **real-time updates** for charger availability and battery data with minimal lag.

NFR-2	**Scalability**	The system should handle **up to 100,000 concurrent users** without degradation.
NFR-3	**Reliability**	• The system should maintain **99.9% uptime** annually. • It must gracefully handle API failures (e.g., fallback to cached charger data).
NFR-4	**Security**	All user data must be encrypted in transit and at rest (e.g., AES-256). Role-based access control should be implemented for fleet or multi-user accounts.
NFR-5	**Portability**	The dashboard must be responsive across **mobile, tablet, and desktop**. It should support **offline mode** with cached data and sync when reconnected
NFR-6	**Testability**	All modules should be covered by **unit and integration tests**. Performance and usability tests must be conducted before major releases