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

Date	31 January 2025
Team ID	LTVIP2025TMID52074
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 (User Story / Task)
FR-1	EV Data Integration & Ingestion	Import and clean datasets (ElectricCarData_Clean.csv, EVIndia.csv, charging_station_list.csv) using pandas and SQL
FR-2	Model and Charger Filtering	Filter EVs by brand, body style, powertrain, efficiency, price, and charger type
FR-3	Dashboard Visualization	Visualize range vs price, charger availability, brand distribution, and efficiency across Tableau charts
FR-4	Geospatial Charging Network Mapping	Map charger stations by region using latitude/longitude; overlay by type and power
FR-5	Comparative Storytelling in Tableau	Create Tableau story with regional personas (e.g., city commuter, long-range traveler)
FR-6	Web Integration	Embed Tableau dashboard into Flask application with responsive layout and filter persistence
FR-7	Predictive Insight Layer *(Optional)*	Integrate price–range–efficiency trend forecasting using Python/Sklearn
FR-8	Export & Sharing Features	Download dashboard as PDF/Image; allow insights to be shared with stakeholders

Non-functional Requirements:

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

NFR No.	Non-Functional Requirement	Description
NFR-1	Usability	UI/UX should be intuitive across Tableau and Flask—clear filters, clean visuals, and mobile-friendly design
NFR-2	Performance	Dashboard should load within 3 seconds; charts must update with minimal latency when filters are applied
NFR-3	Security	Flask app should use secure endpoints; datasets stored locally or via controlled API pipelines
NFR-4	Reliability	All dashboards should render without crashing; charts must reflect accurate and updated data
NFR-5	Availability	Web dashboard should be live 24/7 via Render, with fallback logs if downtime occurs
NFR-6	Scalability	Ability to expand the dashboard to other cities, EV datasets, and predictive modules without redesign