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

Date	31 January 2025
Team ID	LTVIP2026TMIDS87048
Project Name	Intelligent SQL Querying with LLMs Using Gemini
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	User Question Handling	• User can enter questions in plain English • System accepts flexible sentence formats • Input validation before processing
FR-2	LLM-based SQL Generation	• Convert user question into SQL query • Use Gemini model for query generation • Ensure SQLite-compatible syntax • Return only SQL without explanations
FR-3	Database Interaction	• Execute generated SQL query • Connect to SQLite database (data.db) • Fetch results from STUDENTS table • Handle invalid queries safely
FR-4	Output Visualization	• Display query results in UI • Show data in readable format (table/list) • Display empty results gracefully • Show execution errors clearly
FR-5	Transparency & Learning	• Show generated SQL query to user • Allow user to verify query • Help users understand SQL logic
FR-6	System Stability	• Handle API errors (quota/model issues) • Handle SQL execution errors • Display user-friendly error messages

Non-functional Requirements:

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

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	System should provide a simple and intuitive interface where users can easily input questions and view results without SQL knowledge.

NFR-2	**Security**	API keys and database access must be handled securely. Sensitive data such as credentials should not be exposed in the UI or logs.
NFR-3	**Reliability**	System should consistently generate valid SQL queries and execute them correctly under normal operating conditions.
NFR-4	**Performance**	Query generation and execution should occur with minimal delay to ensure smooth user experience.
NFR-5	**Availability**	System should remain accessible whenever users interact with the application, subject to API service availability.
NFR-6	**Scalability**	System design should allow future extension to larger databases, additional tables, or alternative LLM models.