**Project Design Phase-II**

**Solution Requirements (Functional & Non-functional)**

| Date | 25 JUNE 2025 |
| --- | --- |
| Team ID | LTVIP2025TMID21159 |
| Project Name | SmartSDLC – AI-Powered Software Development Lifecycle Optimization |
| 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 | Requirement Management | |  | | --- | | Upload PDF of software requirements |  |  |  |  | | --- | --- | --- | |  |  | Automatically classify text into SDLC phases | |
| FR-2 | Code Generation | Confirmation via Email  Confirmation via OTP |
| FR-3 | Bug Fixing | |  | | --- | | Accept buggy Python code |  |  |  |  | | --- | --- | --- | |  |  | Return corrected version using AI | |
| FR-4 | Test Case Generation | Generate pytest-compatible test cases for given code |
| FR-5 | Chatbot Assistant | |  | | --- | | SDLC-related Q&A |  |  |  |  | | --- | --- | --- | |  |  | General dev assistance via AI chatbot | |
| FR-6 | Code Summarization | |  | | --- | | Accept code snippet |  |  |  |  | | --- | --- | --- | |  |  | Return natural language summary | |
| FR-7 | Model Handling & Fallback | |  | | --- | | Detect GPU and use IBM Granite model |  |  |  |  | | --- | --- | --- | |  |  | Fallback to Groq API when local model is unavailable | |
| FR-8 | Web UI | Use Streamlit for input/output visualization |

**Non-functional Requirements:**

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

| **FR No.** | **Non-Functional Requirement** | **Description** |
| --- | --- | --- |
| NFR-1 | **Usability** | Simple, clean, and interactive UI using Streamlit |
| NFR-2 | **Security** | Secure model/API tokens using .env; restricted backend access |
| NFR-3 | **Reliability** | Fallback to Groq API ensures uninterrupted functionality |
| NFR-4 | **Performance** | Async FastAPI + GPU execution; response within 3 seconds |
| NFR-5 | **Availability** | Always-on service using model fallback logic and error handling |
| NFR-6 | **Scalability** | Modular backend; easily extendable for new features or other LLMs |