**Project Design Phase-II**

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

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| Date | 31 January 2025 |
| Team ID | LTVIP2025TMID32164 |
| Project Name | SmartSDLC – AI-Enhanced Software Development Lifecycle |
| Maximum Marks | 4 Marks |

**Functional Requirements:**

Following are the functional requirements of the proposed solution.

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| **FR No.** | **Functional Requirement (Epic)** | **Sub Requirement (Story / Sub-Task)** |
| FR-1 | User Registration | - Registration through Form  - Registration through Gmail |
| FR-2 | User Login | |  | | --- | |  |  |  | | --- | | - Login via Form  - Session Management | |
| FR-3 | |  | | --- | |  |  |  | | --- | | Requirement Upload | | - Upload SDLC requirement documents |
| FR-4 | |  | | --- | |  |  |  |  |  | | --- | --- | --- | | |  | | --- | |  |  |  | | --- | | Requirement Classification | | | - Classify uploaded requirements as functional or non-functional using AI |
| FR-5 | Code Generation | - Input requirement and generate Python code using AI |
| FR-6 | |  | | --- | |  |  |  | | --- | | Bug Detection and Fixing | | - Upload buggy code and receive AI-corrected version |
| FR-7 | |  | | --- | | Test Case Generation |  |  | | --- | |  | | - Automatically generate test cases for given code |
| FR-8 | |  | | --- | |  |  |  | | --- | | Code Summarization | | |  | | --- | |  |  |  | | --- | | - Summarize uploaded/generated code into plain English explanations | |
| FR-9 | |  | | --- | |  |  |  | | --- | | AI Chatbot Assistant | | - Use chatbot for real-time SDLC-related guidance |
| FR-10 | Voice and Image Input | - Use voice commands for queries  - Upload system design images for future AI enhancements |
| FR-11 | Help Section | Provide user manual, usage tips, and FAQs |

**Non-functional Requirements:**

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

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| **FR No.** | **Non-Functional Requirement** | **Description** |
| NFR-1 | **Usability** | Clean, tabbed UI with chatbot and accessible inputs via Gradio or HTML/CSS |
| NFR-2 | **Security** | |  | | --- | |  |  |  | | --- | | Session-level protection, local-only data handling in current version | |
| NFR-3 | **Reliability** | Consistent response across similar inputs; stable under multi-feature queries |
| NFR-4 | **Performance** | Model response time under 6 seconds; optimized inference on Google Colab |
| NFR-5 | **Availability** | |  |  | | --- | --- | |  | | |  |  |  | | --- | | Web-accessible via Gradio or Streamlit; minimal downtime | |
| NFR-6 | **Scalability** | |  | | --- | |  |  |  | | --- | | Easily extendable to use Firebase, backend APIs, database storage, and CI/CD | |