**Project Design Phase-II**

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

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| Date | 26 june 2025 |
| Team ID | LTVIP2025TMID37102 |
| Project Name | “Smart sdlc-Ai-Enhanced software development life cycle |
| 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 Input** | **Upload Requirements in PDF / DOCX format** |
| **FR-2** | **Requirement Analysis** | **Extract structured information (modules, features, entities)** |
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| **FR-3** | **Code Generation** | **Generate backend code from text** |
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| **FR-4** | **Bug Fixing** | **Submit buggy code for AI analysis** |
|  |  |  |
| **FR-5** | **Test Case Generation** | **Generate unit test cases for submitted code** |
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| **FR-6** | **Documentation** | **Summarize code for documentation** |
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| **FR-7** | **Chatbot Assistant** | **Ask SDLC/code-related queries** |
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| **FR-8** | **User Management** | **Manage user login and session** |
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**Non-functional Requirements:**

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| FR No. | Non-Functional Requirement | Description |
| NFR-1 | Usability | The platform should have a clean and intuitive interface (via Gradio), making it easy for users to input requirements, generate code, and use AI features efficiently. |
| NFR-2 | Security | Ensure secure data and user handling using HTTPS, JWT authentication, input validation, and access control for protected endpoints. |
| NFR-3 | Reliability | The application should operate consistently across different scenarios with robust error handling, logs, and minimal downtime. |
| NFR-4 | Performance | AI-based outputs (code, tests, summaries) should be generated within 2–3 seconds for typical inputs using optimized backend (FastAPI, async calls). |
| NFR-5 | Availability | The application should be available 24/7 with minimal downtime, supported by cloud deployment and auto-restart/failover mechanisms. |
| NFR-6 | Scalability | The system should support scaling across users, tasks, and workloads using modular architecture, Docker containers, and cloud-native deployments (IBM Cloud/Kubernetes). |