CHAPTER – 3

SYSTEM REQUIREMENTS SPECIFICATION

3.1 System Requirements Specification

The system aims to deliver a scalable, responsive, and adaptive learning platform.

3.2 Specific Requirement

3.2.1. Hardware Specification

- CPU: Dual-core
- RAM: 2 GB
- Storage: 250 GB SSD
- Network: High-speed internet
- Resolution: 1024x768 or higher

3.2.2. Software Specification

- Backend: Python 3.8+, Django 3.2+
- Frontend: Tailwind CSS 3.x, Bootstrap 5.x

3.3 Performance Requirement

The *SmartQuiz System* is developed as an in-memory adaptive quiz application to deliver efficient, scalable, and responsive performance. This approach leverages in-memory architecture to enhance user engagement, adaptability, and reliability. The following performance requirements ensure that the system operates seamlessly for all users.

- **Responsive User Interaction**
  - **Adaptive Quiz Loading:** Questions are provided instantly as users progress, with in-memory architecture minimizing load times and enhancing the flow of quizzes.
  - **Real-time Feedback Mechanism:** Immediate feedback is given after each response, allowing users to adapt quickly and stay engaged through dynamically adjusted question difficulty.
- **Scalability**
  - **Concurrent User Support:** The system supports high-volume concurrent access, efficiently meeting the demands of educational institutions or large user groups without compromising performance.

- **Efficient Data Access and Processing:** With in-memory data handling, the system performs real-time analysis and adaptive adjustments, ensuring responsive and adaptable quiz experiences for all users.

- **Reliability and Availability**
  - **Consistent Uptime:** High system availability is maintained, ensuring that users can access quizzes and feedback continuously. Redundancy and error recovery mechanisms further enhance system reliability and prevent service interruptions.
  - **Fault Tolerance and Recovery:** The in-memory structure supports rapid recovery and maintains data integrity even under high demand or unexpected disruptions, ensuring an uninterrupted user experience.
- **Throughput and Data Handling**
  - **High Submission Processing Capacity:** The in-memory design allows efficient handling of quiz submissions, tracking real-time user activity, and providing immediate analytics.
  - **Adaptive Algorithm Execution:** Adaptive algorithms are optimized within the in-memory environment, allowing the system to tailor quiz difficulty in real-time without the delays associated with traditional data storage.
- **Data Management and Security**
  - **Optimized Data Storage:** In-memory storage optimizes active data management, reducing redundancy and latency, even as the system scales.
  - **Secure User Data Handling:** Robust data security measures are in place, ensuring user data privacy and meeting standard security requirements to protect sensitive information.

These performance requirements make the *SmartQuiz System* a reliable, adaptive learning platform, built for high engagement and scalability. By utilizing in-memory architecture, the system efficiently provides real-time feedback, adapts to user performance, and ensures an uninterrupted and secure learning experience.