

Smart Health Monitoring System - Project Report

1. Project Requirements and Marking Rubric Explanation

This section elaborates each of the 7 evaluation criteria for GUI-based projects based on the Smart Health Monitoring System developed using JavaFX and MySQL.

1. Core Feature Implementation:

The system includes login/register, real-time simulated sensor values for temperature and heart rate, live dashboard, database integration, and user management.

2. Error Handling & Robustness:

All operations (login, database access, sensor simulation) are surrounded with try-catch blocks. User-friendly alerts are provided for invalid inputs and system issues.

3. Integration of Components:

JavaFX front-end, Java-based backend, and MySQL database are tightly integrated for seamless operation. Login leads to dashboard, which connects with data modules.

4. Event Handling & Processing:

GUI elements (buttons, fields) respond to user interaction via FXML and Java event listeners. Timelines update sensor data at regular intervals.

5. Data Validation:

Client-side validation ensures temperature (34-45°C) and heart rate (40-200 bpm) are within range. Secure DB queries with PreparedStatement prevent SQL injection.

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6. Code Quality & Innovation:

The code is modular (separate files for UI, DB, and logic), cleanly commented, and includes alert-triggering based on abnormal vitals.

7. Project Documentation:

README contains setup instructions, features list, screenshots, test credentials, and usage details.

2. Detailed Elaboration of Each Guideline

Each evaluation parameter has been mapped to your Smart Health Monitoring System project, covering technical implementations and code samples.

- Core Feature Implementation: Covers all major use cases including real-time data updates and role-based access.
- Error Handling: Handles exceptions in DB access, login, and input parsing.
- Integration: Frontend, backend, and DB logic work in sync.
- Event Handling: Uses JavaFX listeners for dynamic UI response.
- Data Validation: Temperature and heart rate values are strictly validated.
- Code Quality: Commented, modular, MVC-structured code.
- Documentation: Full README with steps, images, and features.

3. Project Conclusion

The Smart Health Monitoring System is a robust and user-friendly health tech prototype. Developed using

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Java, JavaFX, and MySQL, it simulates and monitors vital health signs.

Key Achievements:

- Real-time vital sign simulation
- Secure user login and role-based dashboard
- MySQL-backed storage and retrieval of vitals
- GUI with alerts and validations
- Modular MVC architecture and error handling

Skills Demonstrated:

- GUI development, JDBC, validation, modular Java coding

Future Scope:

- IoT sensor integration
- Export to CSV/PDF
- Cloud deployment
- Alert via SMS/Email

Conclusion:

The project meets all the evaluation standards for GUI-based systems. It is technically sound, creatively implemented, and showcases a deep understanding of applied biomedical technology through software engineering.