**Project Design Phase-II**

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

| Date | 30-07-2025 |
| --- | --- |
| Team ID | PNT2025TMID14372 |
| Project Name | Predictive Pulse: Harnessing Machine Learning for Blood Pressure Analysis |
| Maximum Marks | 4 Marks |

**Functional Requirements:**

Following are the functional requirements of the proposed solution.

**Functional Requirements – Predictive Pulse :- Harnessing ML For Blood Pressume Analysis**

## **Functional Requirements for Predictive Pulse: Harnessing Machine Learning for Blood Pressure Analysis**

### 1. **User Management**

* FR1.1: The system shall allow users to register and log in securely.
* FR1.2: The system shall support role-based access (e.g., Patient, Doctor, Admin).
* FR1.3: The system shall allow users to update and manage their personal and health profile.

### 2. **Data Collection & Integration**

* FR2.1: The system shall accept manual BP data entry from the user.
* FR2.2: The system shall integrate with external wearable or medical devices to fetch BP data.
* FR2.3: The system shall store all BP readings with timestamps and associated metadata.

### 3. **Data Preprocessing**

* FR3.1: The system shall clean and normalize incoming blood pressure data.
* FR3.2: The system shall detect and remove outliers or inconsistent readings.

### 4. **Machine Learning Prediction**

* FR4.1: The system shall use a trained ML model to predict future BP trends.
* FR4.2: The system shall retrain the model periodically based on new data (admin/ML team).
* FR4.3: The system shall provide prediction accuracy and model performance metrics.

### 5. **Visualization & Reporting**

* FR5.1: The system shall display historical BP data in a user-friendly graphical format.
* FR5.2: The system shall provide comparative analysis (e.g., daily, weekly, monthly trends).
* FR5.3: The system shall generate downloadable health reports in PDF format.

### 6. **Alerts & Recommendations**

* FR6.1: The system shall send real-time alerts to users for abnormal readings.
* FR6.2: The system shall provide personalized health tips based on BP patterns.
* FR6.3: The system shall notify doctors in case of critical health indicators (if consented by the user).

### 7. **Doctor Dashboard**

* FR7.1: The system shall allow doctors to view their patients’ BP history and trends.
* FR7.2: The system shall allow doctors to add medical notes and recommendations.
* FR7.3: The system shall allow communication between patient and doctor via in-app messaging or notes.

### 8. **Security & Privacy**

* FR8.1: The system shall encrypt all personal and health data at rest and in transit.
* FR8.2: The system shall comply with healthcare data protection laws (e.g., HIPAA/GDPR).
* FR8.3: The system shall allow users to delete or export their data on request.