Software Requirements Specification (SRS)

Title: Heart Failure Readmission Prediction - Requirements Document

1. Introduction

- **Purpose:** To predict 30-day readmission risk in heart failure patients using MIMIC-III dataset.
- **Scope:** A machine learning pipeline from data extraction → preprocessing → modeling → deployment.
- **Stakeholders:** Hackathon judges, team members, potential healthcare researchers.

2. Functional Requirements

- R1: The system should load and preprocess structured data from the MIMIC-III database.
- R2: The model should classify patients as high/low readmission risk.
- R3: The system should evaluate predictions using precision, recall, F1-score, ROC-AUC.
- R4: The user should be able to run predictions via a simple UI or script interface.

3. Non-Functional Requirements

- NFR1: The model should return results within 2 seconds per record.
- NFR2: Accuracy and F1-score should exceed baseline models.
- NFR3: The solution should be replicable with documented code.

4. Data Requirements

- Features extracted from provided subset of MIMIC-III.
- Target: `readmit_30_days`.
