Requirements Document

Problem Statement

Heart failure is a serious condition that can lead to death if not managed properly. Even after treatment and discharge, many patients are readmitted to the hospital within 30 days, which:

- Increases the risk of death (morbidity and mortality)
- Causes a financial burden for patients and families
- Puts more pressure on already overloaded healthcare systems.

Our Objective

We need to develop a machine learning model to:

- Predict whether a patient will be readmitted within 30 days of discharge after being treated for heart failure.

This is a binary classification problem, where the target is:

1 (positive) → Patient is readmitted within 30 days.

0 (negative) → Patient is not readmitted within 30 days.

The following are the requirements:

Req. ID	Requirement Description	Priority (High/Med/Low)
R1	The system must accept top 20 structured patient data as input.	High
R2	The ML model must predict 30-day readmission accurately.	High
R3	The system must handle imbalanced data.	High
R4	Results should include performance metrics like Precision-Recall AUC.	High
R5	A user-friendly UI should allow clinicians to input data and see predictions.	Medium
R6	Model inference should be under 5 second.	Medium