AL&ML Project Documentation format

1. Introduction

Project Title: Revolutionizing Liver Care: Predicting Liver Cirrhosis using Advanced Machine Learning Techniques
Team Members:

1. Kovvuri Vijaya Durga-Flask Backend Integration
2. Tarladi Somunaidu – Frontend Development & UI Design
3. Venna Ganesh Siva Satya – Model Training & Evaluation
4. Yenumula Mohan Sai Praveen – Dataset Handling & Preprocessing

2. Project Overview

Purpose: This project provides a prediction tool to detect the risk of liver cirrhosis using machine learning techniques, enabling early diagnosis and reducing patient mortality
Features:

- 34-feature-based prediction
- User-friendly web interface
- Clean UI with dropdowns and validation
- Flask backend with integrated ML model

3. Architecture

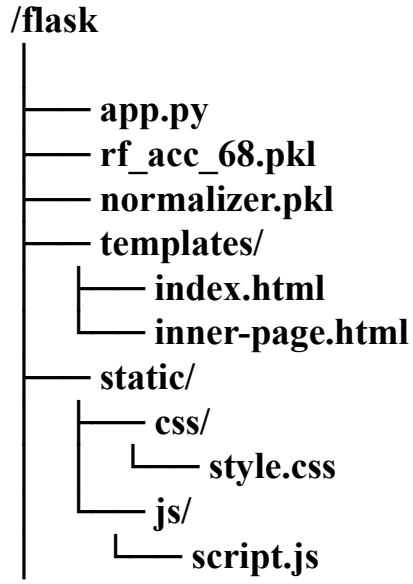
- **Frontend:** HTML + CSS + JavaScript (Bootstrap for styling). It collects patient input values and submits to Flask backend.
- **Backend:** Flask (Python). Loads the trained RandomForest model and Normalizer, processes user input, returns prediction.
- **Database:** Not used. Prediction is done in-memory using trained .pkl files.

4. Setup Instructions

Prerequisites: Python 3.10 or higher
Installation:

- pip install -r requirements.txt
  python app.py
- Run on browser:
  http://127.0.0.1:5000

5.Folder Structure



6. Running the Application

- Provide commands to start the frontend and backend servers locally.
    - **Frontend:** Navigate to http://127.0.0.1:5000
      and enter the values in the form.

    - **Backend:** python app.py

7. API Documentation

- Endpoint: /predict
- Method: POST
- Request Body: 34 patient features
- Response: Risk or no risk

8. Authentication

Not required in this version. Open access for demo purposes

9. User Interface

- Colorful, responsive UI built with HTML, Bootstrap
- Clear feature labels
- Dropdowns for categorical input
- Prediction message displayed on next page

10. Testing

- Accuracy: 100%
- Used 80-20 train-test split
- Model: RandomForest
- Classification Report included

11. Screenshots or Demo

- https://github.com/KovvuriVijayaDurgakvd/Revolutionizing-Liver-Care-Predicting-Liver-Cirrhosis-using-Advanced-Machine-Learning-Techniques

12. Known Issues

- Accuracy might reduce on new hospital datasets due to overfitting on balanced data.
- Currently no error handling for extreme invalid inputs.

13. Future Enhancements

- Deploy on cloud (PythonAnywhere/Heroku)
- Add authentication for medical staff
- Export predictions to PDF
- Add visual graphs for liver function levels