Project Report Format

INTRODUCTION

1.1 Project Overview

Revolutionizing Liver Care: Predicting Liver Cirrhosis using Advanced Machine Learning Techniques

This project uses machine learning to predict liver cirrhosis from patient data. With the help of clinical features like enzyme levels, bilirubin, protein ratios, and others, the model classifies whether a patient is at risk or not, aiding early diagnosis.

1.2 Purpose

To assist healthcare professionals and patients by providing an easy-to-use tool that predicts the risk of liver cirrhosis based on 34 medical indicators, enabling early intervention.

2. IDEATION PHASE

2.1 Problem Statement

Late-stage diagnosis of liver cirrhosis leads to high mortality. A tool that predicts risk using clinical data can save lives by enabling timely treatment.

2.2 Empathy Map Canvas

2.3 Brainstorming

- Use a clinical dataset
- Apply Random Forest model
- Create a web app for ease of use
- Target doctors, hospitals, and awareness campaigns

3. REQUIREMENT ANALYSIS

3.1 Customer Journey map

1. Patient reports symptoms
2. Doctor enters values into web form
3. Model predicts cirrhosis risk
4. Patient is referred for further tests if needed

3.2 Solution Requirement

- Accurate prediction
- 34 input fields
- Flask backend
- HTML frontend

3.3 Data Flow Diagram

➞ CSV Input → Preprocessing → Model Prediction → Output to UI

3.4 Technology Stack

- Python
- Scikit-learn
- Pandas
- Flask
- HTML/CSS/JS

4. PROJECT DESIGN

4.1 Problem Solution Fit

Identifies a real health risk and provides a low-cost, fast, and scalable ML-based diagnostic aid.

4.2 Proposed Solution

Build and deploy a liver cirrhosis prediction model using a dataset of 950 patients and 34 medical features.

4.3 Solution Architecture

Already shared above — includes data flow, Flask integration, and user interface.

5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

1. Dataset Cleaning & Preprocessing
2. Model Training & Validation
3. Flask Integration
4. UI Design
5. Testing & Demo

6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

- Accuracy: 100%
- Model: RandomForest
- Validation: 80/20 split

7. RESULTS

7.1 Output Screenshots

The source code and output screenshots are available in the accompanying files.

8. ADVANTAGES & DISADVANTAGES

Advantages:

- Fast prediction
- Simple UI
- No login required
- Clinical feature-based

Disadvantages:

- Cannot replace lab diagnosis
- Dependent on data accuracy

9. CONCLUSION

This ML-powered liver cirrhosis predictor is a helpful diagnostic tool. With accurate input, it aids decision-making and can be scaled into healthcare portals.

10. **FUTURE SCOPE 11. APPENDIX**

Dataset link: https://www.kaggle.com/datasets/bhavanipriya222/liver-cirrhosis-prediction

GitHub & Project Demo Link

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