Project Report Format

1. **INTRODUCTION**

1.1 Project Overview

This project aims to develop a machine learning–based liver cirrhosis prediction system that can assess a patient's risk level using clinical data. It provides an accessible, non-invasive way to support early diagnosis.

1.2 Purpose

To offer a reliable, cost-effective tool for early detection of liver cirrhosis by leveraging clinical features and a trained ML model, presented through a user-friendly web interface.

2. **IDEATION PHASE**

2.1 Problem Statement

Liver cirrhosis is often diagnosed at an advanced stage due to lack of awareness and access to early testing. This delay leads to higher treatment costs and worse outcomes.

2.2 Empathy Map Canvas

Focuses on users' fear, confusion, and lack of affordable diagnostic access. Helps define the solution from a human-centered design perspective.

2.3 **Brainstorming**

Discussions led to choosing a Random Forest model for prediction, Flask for deployment, and a simple web UI for interaction.

3. **REQUIREMENT ANALYSIS**

3.1 Customer Journey map

Identifies user touchpoints: data input → prediction → recommendation → follow-up.

3.2 Solution Requirement

Functional and non-functional requirements like user registration, secure data handling, and low response time.

3.3 Data Flow Diagram

Illustrates the flow from user input to model processing and result output.

3.4 Technology Stack

- **Front end**: HTML, CSS, JS
- **Back end**: Flask (Python)
- **Model**: Random Forest
- **Storage**: Local/Cloud-based CSV
- **Tools**: VS Code, Pandas, Scikit-learn

4. **PROJECT DESIGN**

4.1 Problem Solution Fit

Matches the user's need for simple early prediction with a trained ML model.

4.2 Proposed Solution

A web-based application where users input test values and get a risk prediction.

4.3 Solution Architecture

Includes UI, back end, ML model, and output layer, all integrated via Flask.

5. **PROJECT PLANNING & SCHEDULING**

5.1 Project Planning

Divided into sprints: data handling, model training, interface design, and deployment. Velocity calculated and tracked.

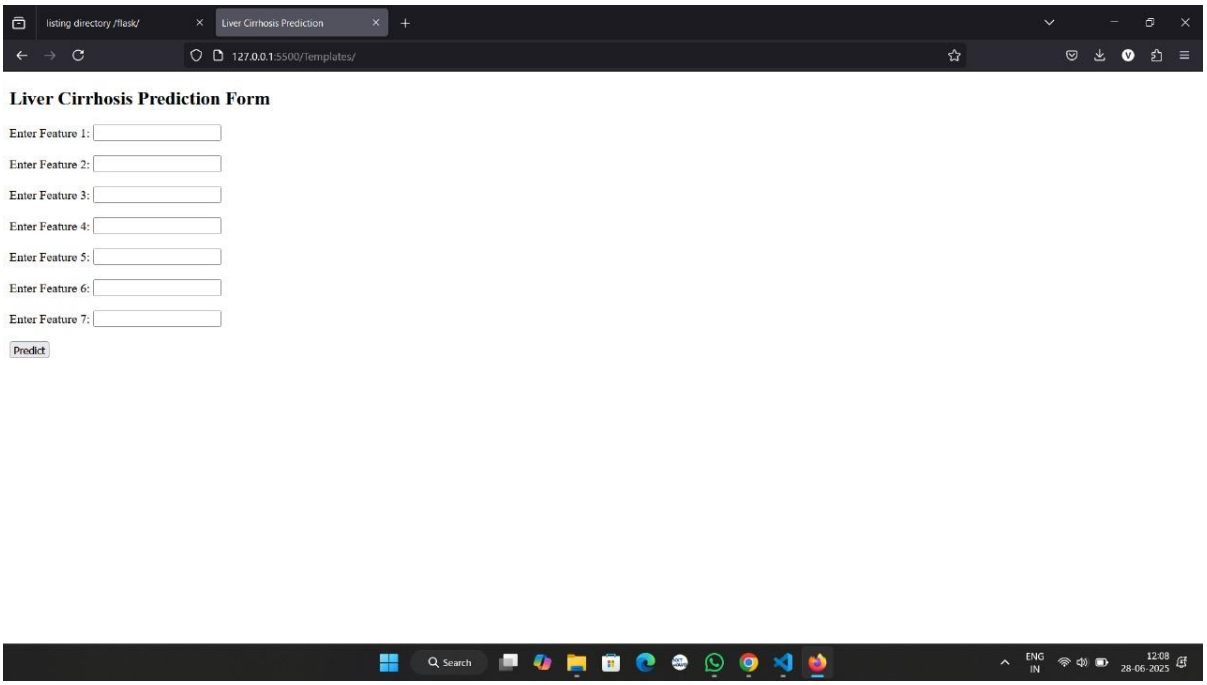
6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

Measured model accuracy, response time, and system load handling.

7. RESULTS

7.1 Output Screenshots



8. ADVANTAGES & DISADVANTAGES

Advantages:

- Non-invasive, early prediction
- Fast, user-friendly
- Accessible to remote users

Disadvantages:

- Not a replacement for clinical diagnosis
- Depends on data quality
- May have limited inter pretability for lay users

9. CONCLUSION

The system helps users identify early-stage liver cirrhosis risk using machine learning. It is fast, cost-effective, and designed with empathy.

10. FUTURE SCOPE

The system helps users identify early-stage liver cirrhosis risk using machine learning. It is fast, cost-effective, and designed with empathy.

11. APPENDIX

Source Code(if any)

Dataset Link

GitHub & Project Demo Link

https://github.com/varma-raju-2702/liver-cirrhosis-predictor

https://github.com/varma-raju-2702/liver-cirrhosis-predictor/commit/4522695d9af5c6516381ec5c7c935b234c2fc425

https://github.com/varma-raju-2702/liver-cirrhosis-predictor/commit/0adcf45f19ff03c2b07d94e2beb08a1e76ced6c8#diff-c9ec992b21586418d7c6802cc536ae7744abc40dee0892191a858437dbf57303

https://drive.google.com/file/d/1lKQ7K8bUYaw9ygrz48r78EYWHcGS7ClX/view?usp=sharing