

Ideation Phase

Brainstorm & Idea Prioritization Template

Date	16 June 2025
Team ID	LTVIP2025TMID35624
Project Name	Revolutionizing Liver Care: Predicting Liver Cirrhosis Using Advanced Machine Learning Techniques
Maximum Marks	4 Marks

Brainstorm & Idea Prioritization Template:

Step-1: Team Gathering, Collaboration and Select the Problem Statement

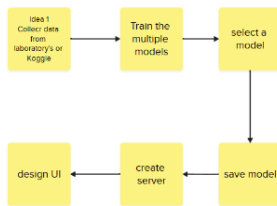
The screenshot shows a Miro collaborative workspace. At the top, the board is titled "Predicting Liver Cirrhosis". On the left, a green sticky note titled "Team" lists five members: 1. Thathireddy Eswarreddy, 2. Dasari Gowthami, 3. Golla Navitha, 4. Baripireddy Saichandhanreddy, and 5. D Harsha Vardhan. An arrow points from this team note to a larger grey sticky note on the right titled "Problem Statement". The problem statement text reads: "Liver cirrhosis is a life-threatening condition that often goes undetected until it reaches an advanced stage. Early diagnosis is critical for effective treatment and improved survival rates, yet traditional diagnostic methods are invasive, time-consuming, and costly. This project aims to transform liver care by applying advanced machine learning techniques to predict liver cirrhosis from non-invasive clinical and laboratory data. By uncovering hidden patterns in patient data, the system provides accurate, early-stage predictions-enabling timely interventions and personalized healthcare solutions." The interface includes a top toolbar with icons for Facilitate, Share, and other collaboration tools, and a bottom toolbar with a zoom level of 38%.

Step-2: Brainstorm, Idea Listing and Grouping

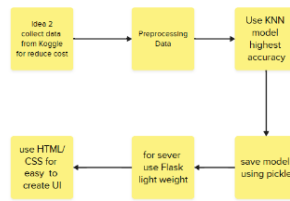
Brainstorm

write down any ideas that comes to mind that address our Problem statement

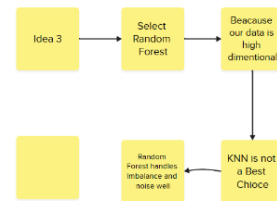
Thathireddy Eswarreddy



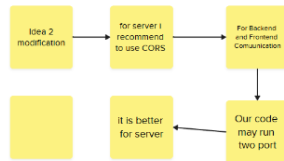
Desari Gowthami



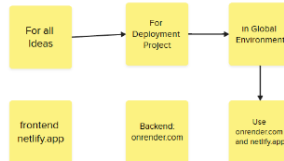
Golia Navitha



Boripreddy Sai Chandhanreddy



D Harsha Vardhan



Group Idea

1. Data Collection & Preprocessing

- Perform preprocessing steps such as:
 - Handling missing values
 - Encoding categorical variables (e.g., gender, yes/no lifestyle factors)
 - Normalizing continuous features
 - Feature selection to retain only the most relevant attributes

• Data Exploration and Preprocessing

- Univariate Analysis: Histograms were plotted for numerical features.
- Bivariate Analysis: Scatter plots and pair plots explored relationships between features.
- Outlier Handling: Outliers were detected and managed using the IQR method.

2. Model Development

- Train and evaluate multiple machine learning algorithms, including:
 - Random Forest
 - Naïve Bayes
 - XG Boost
 - Logistic Regression CV
 - Random Forest
 - Support Vector Classifier
 - Ridge Classifier
 - Logistic Regression
 - K-Nearest Neighbors (KNN)
- Apply cross-validation and hyperparameter tuning to optimize performance.
- Use evaluation metrics: Accuracy, Precision, Recall, F1-score, and Confusion Matrix to validate the models.

3. Model Selection

We will select and optimize the best model based on performance metrics to achieve the highest accuracy.

4. Prediction

- Generate predictions in the form of: Binary classification (Cirrhosis: Yes/No)

5. Interface Design

- Building a user-friendly web or mobile platform using tools like: HTML/ CSS + JavaScript(Frontend), Flask (Backend)

Users can input lab results and receive the Prediction results.

Step-3: Idea Prioritization

