**Project Initialization and Planning Phase**

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| Date | 09 July 2024 |
| Team ID | SWTID1720013031 |
| Project Title | Prediction and Analysis of Liver Patient Data Using Machine Learning |
| Maximum Marks | 3 Marks |

**Project Proposal (Proposed Solution) report:**

The proposal report aims to leverage advanced machine learning techniques to improve the accuracy and efficiency of liver disease diagnosis and treatment planning. By integrating diverse liver patient datasets and applying sophisticated predictive models, this project seeks to enable early detection, personalized treatment plans, and real-time data analysis. The proposed solution includes data preprocessing, feature engineering, model development, and deployment within a user-friendly application. This approach not only enhances clinical decision-making but also ensures data security and compliance with healthcare regulations, ultimately improving patient outcomes and healthcare efficiency.

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| **Project Overview** | |
| Objective | The primary objective of this project is to leverage machine learning algorithms to enhance the accuracy and efficiency of liver disease diagnosis, prognosis, and treatment planning by analyzing diverse liver patient data. |
| Scope | The project comprehensively addresses and enhances the diagnosis and treatment process for liver diseases, incorporating machine learning for a more robust and efficient system. |
| **Problem Statement** | |
| Description | The current methods of diagnosing and managing liver disease are often reactive, time-consuming, and prone to errors due to the reliance on human expertise and traditional diagnostic tools. There is a critical need for a more proactive, accurate, and efficient approach to analyzing liver patient data to improve patient outcomes and optimize treatment plans. |
| Impact | Earlier and more accurate diagnosis of liver disease. Improved patient outcomes through personalized treatment plans. Reduced time and effort in data analysis for healthcare professionals. Overall improvement in healthcare quality and efficiency. |
| **Proposed Solution** | |
| Approach | Employing machine learning techniques to analyze and predict liver disease outcomes, creating a dynamic and adaptable diagnostic and treatment planning system. |
| Key Features | - Implementation of a machine learning-based liver disease prediction model.  - Real-time data analysis for quicker diagnosis and treatment planning.  - Continuous learning to adapt to evolving medical knowledge and patient data. |

**Resource Requirements**

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| **Resource Type** | **Description** | **Specification/Allocation** |
| **Hardware** | | |
| Computing Resources | CPU/GPU specifications, number of cores | 12th Gen Intel(R) Core(TM) i5-12450H ,8 Cores,T4 GPU |
| Memory | RAM specifications | 16 GB |
| Storage | Disk space for data, models, and logs | 512 GB SSD |
| **Software** | | |
| Frameworks | Python frameworks | Flask |
| Libraries | Additional libraries | Numpy , Scikit-learn, Pandas, Matplotlib and Seaborn, Pickle |
| Development Environment | IDE, version control | Jupyter Notebook(7.0.8), Google Collab , Spyder(Python 3.11) |
| **Data** | | |
| Data | Source, size, format | Kaggle dataset, 583 rows and 11 columns, Text |