Graduation Project Proposal Form

1. Project Information

- **Project Title:** *Cirrhosis Prognosis Pro: Advanced Prediction Models*
- **Course/Track:** *Data Engineer/AI & Data Science*
- **Done By:**
    - Nayera Ammar Imam

2. Project Overview

- **Objective:**

Develop predictive models to assess treatment responses and survival outcomes in cirrhosis patients, enabling healthcare providers to make informed decisions and improve patient management.

- **Scope of Work:**
    - Collect and preprocess patient data, including clinical features, laboratory results, and treatment history.
    - Develop and validate machine learning models to categorize patient outcomes.
    - Analyze and interpret model results to provide actionable insights for healthcare professionals.
    - Create a user-friendly visualization dashboard for presenting predictions and assisting in treatment planning.
- **Expected Outcomes:**
    - Accurate predictive models for identifying treatment responses and survival probabilities in cirrhosis patients.
    - Improved clinical decision-making through data-driven insights.
    - A comprehensive report detailing model performance, clinical implications, and recommendations for patient care.

3. Problem Statement

Cirrhosis patients face diverse outcomes influenced by their unique clinical profiles. Current predictive methods are often inadequate, resulting in suboptimal care. There is a critical need for robust predictive models to stratify patients effectively, assess risk, and support management strategies.

4. Proposed Solution

- **Technologies Used:**
  - **Database:** Relational database (PostgreSQL or MySQL)
  - **Programming Language:** Python
  - **Data Manipulation and Analysis Tools:** Pandas, NumPy
  - **Machine Learning Libraries:** Scikit-learn, XGBoost
  - **Data Visualization:** Matplotlib, Seaborn
  - **Web Framework:** Flask or Dash
  - **Cloud Platform:** Microsoft Azure for scalable deployment
- **System Architecture:**
  - Data Collection
  - Data Preprocessing
  - Model Development
  - Model Evaluation
  - Dashboard Development
  - Deployment

5. Resources Needed

- **Hardware:**
  - Computer with at least 8 GB RAM and a multi-core CPU for model training.
  - Optional server for hosting the web dashboard.
- **Software:**
  - Python 3.x with libraries like Pandas, NumPy, Scikit-learn, and XGBoost.
  - IDE: Jupyter Notebook, PyCharm, or VS Code.
  - Database management system: SQLite or PostgreSQL.
  - Web framework: Flask or Dash.
  - Version control system: Git.

6. Approval

5 September 2024