

Problem Statement: Medical Dashboard for Predicting Patient Readmissions

Event Details:

- **Duration:** 2 Days (6 hours per day of live development) + 1 Day for Pitching
- **Pitch Date:** Day 3

Objective:

Develop a functional prototype of a medical dashboard that predicts patient readmissions using the MIMIC-III Clinical Database. The prototype should be presented as a monetizable solution, demonstrating its value and potential impact.

Dataset:

- **Source:** MIMIC-III Clinical Database
- **Features Available:**
 - **Patient Health Data:** Various health metrics, vital signs, and patient history.
 - **Readmission Records:** Historical data on patient readmissions, including reasons and timings.

Requirements:

1. Dashboard Features:

- **Predictive Modelling:** Create a predictive model to estimate patient readmission risk using historical data.
- **Data Visualization:** Implement interactive visualizations to display:
 - Trends in readmission rates.
 - Key health metrics.
 - Risk factors and predictions.
- **Insights and Recommendations:** Offer actionable insights, such as:
 - Identification of high-risk patients.
 - Suggested interventions to mitigate readmissions.
- **User Interface:** Ensure the interface is user-friendly and suitable for healthcare professionals.

2. Technical Specifications:

- **Frontend:** Build a responsive UI with React (Next.js). Use libraries like Chart.js or D3.js for visualizations.
- **Backend:** Set up a backend with Node.js and Express, and use Prisma ORM with PostgreSQL for data management.
- **Machine Learning:** Implement a predictive model in Python using libraries such as scikit-learn, TensorFlow, or Keras.
- **Deployment:** Deploy the frontend on Vercel and the backend on a cloud service like Heroku or AWS.

Development Schedule:

Day 1:

- **Morning Session (3 hours):**
 - Initial setup of the project.
 - Backend development: Database schema, API routes.
 - Preliminary model development and data integration.
- **Afternoon Session (3 hours):**
 - Frontend development: Basic UI layout and integration with backend.
 - Initial data visualization and dashboard features.
 - Begin testing and debugging.

Day 2:

- **Morning Session (3 hours):**
 - Finalize the predictive model and integrate it with the dashboard.
 - Complete frontend features and ensure all visualizations are functional.
 - Implement insights and recommendation features.
- **Afternoon Session (3 hours):**
 - Final testing and debugging.
 - Prepare for the pitch: Create a presentation highlighting key features, insights, and monetization strategy.

Day 3: Pitch Preparation

- Prepare a presentation covering:
 - **Problem Statement:** Clearly define the problem and how the dashboard addresses it.
 - **Solution Overview:** Demonstrate the dashboard's features and functionalities.
 - **Predictive Model:** Explain the model's accuracy, key findings, and its impact.
 - **Monetization Strategy:** Detail how the dashboard can be monetized (e.g., licensing, subscription model).
 - **Technical Challenges:** Discuss any challenges faced and how they were overcome.
 - **Future Enhancements:** Outline potential improvements or additional features.

Monetizable Pitch Points:

- **Value Proposition:** Highlight how the dashboard improves patient management and reduces readmissions, leading to cost savings for healthcare providers.
- **Market Potential:** Discuss the potential market for the dashboard and its scalability.
- **Revenue Models:**
 - **Licensing:** Offer the dashboard as a licensed product for healthcare institutions.
 - **Subscription:** Provide a subscription model for ongoing access to advanced features and updates.

- **Consulting:** Offer consulting services for data analysis and insights.

Prizes:

- **First Prize:** ₹5,000
- **Second Prize:** \$1,660 USD worth (approximately ₹1,35,000 INR) Wolfram One License for each team member
- **Third Prize:** Proto Io License for each team member

Evaluation Criteria:

- **Functionality:** The prototype's ability to predict readmissions and provide valuable insights.
- **User Experience:** Quality and usability of the dashboard's interface.
- **Technical Execution:** Robustness of the backend, model accuracy, and integration.
- **Pitch Effectiveness:** Clarity of the pitch, including value proposition, monetization strategy, and overall presentation.

Contact Information:

For further details or queries, please contact POCs of Hackathon.

Harshit Agarwal: +91 9776076583

Rupam Das: +91 7777777777