Proposal for Final Year Project
Data Science Department

Proposal for Final Year Project #013 (for 2 students)

Date: May 2, 2023

Title: Predictive Modeling for Disease Risk Assessment

Objective: The goal of this project is to develop a predictive model that analyzes patient medical records to flag the highest risk factors for certain diseases. The model will take into account patient demographics, lifestyle factors, and medical history to generate a risk assessment score for each patient.

Methodology:

1. Collect medical records from different sources and compile them into a single database. Ensure that the database complies with ethical guidelines for handling patient data.
2. Develop a questionnaire for new patients that captures relevant demographic, lifestyle, and medical history information.
3. Analyze the database to identify correlations between patient data and disease risk factors. Use machine learning algorithms such as logistic regression, decision trees, and random forests to develop the predictive model.
4. Test the predictive model on a subset of the database and evaluate its performance using metrics such as precision, recall, and F1-score.
5. Integrate the predictive model into the clinic's patient intake process. Patients will complete the questionnaire and receive a risk assessment score based on their answers.
6. Generate visualizations based on the patient's risk assessment score to assist the doctor in making treatment decisions.

Expected Outcomes:

1. A predictive model that accurately assesses disease risk based on patient data.
2. A streamlined patient intake process that improves the efficiency of the clinic.
3. Improved treatment decisions based on patient risk assessment scores and visualizations.
4. Insights into the factors that contribute to disease risk, which can inform public health initiatives and preventive measures.
5. A research paper documenting the project's methodology, results, and potential impact.

Tools and Technologies:

1. Python for data collection, cleaning, and analysis.
2. Machine learning libraries such as scikit-learn and TensorFlow for developing the predictive model.
3. Visualization tools such as matplotlib and seaborn for generating visualizations.
4. SQL or NoSQL databases for storing and querying the patient data.
5. Ethical guidelines for handling patient data.

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Background: Cybersecurity is critical for all organizations as cyberattacks can cause a significant impact on the business operations and reputation. Cybersecurity engineers receive information from various sources that need to be analyzed and visualized in a unified dashboard for better visibility.

Objective: The objective of this project is to create a Cyber Security Standardization Dashboard that integrates data from different cybersecurity applications to provide a comprehensive view of the network being monitored. The dashboard should help the engineers to monitor and respond to any security threats in real-time.

In conclusion, the proposed project aims to create a comprehensive medical database and analyze patient risk factors based on their input questionnaire. By compiling medical records and identifying correlations, the system can flag potential health risks and help doctors prioritize patients' treatment plans. Furthermore, the system can generate visualizations based on the complete data, providing doctors with more insights into the patient's medical history. This project has the potential to improve the accuracy of patient diagnosis and treatment, ultimately enhancing the overall quality of healthcare.

Thank you.

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