Project Design Phase-I
Solution Architecture

Date	4 November 2023
Team ID	Team-593059
Project Name	The Sleep Oracle Anticipating Health and Lifestyle Through Data
Maximum Marks	4 Marks

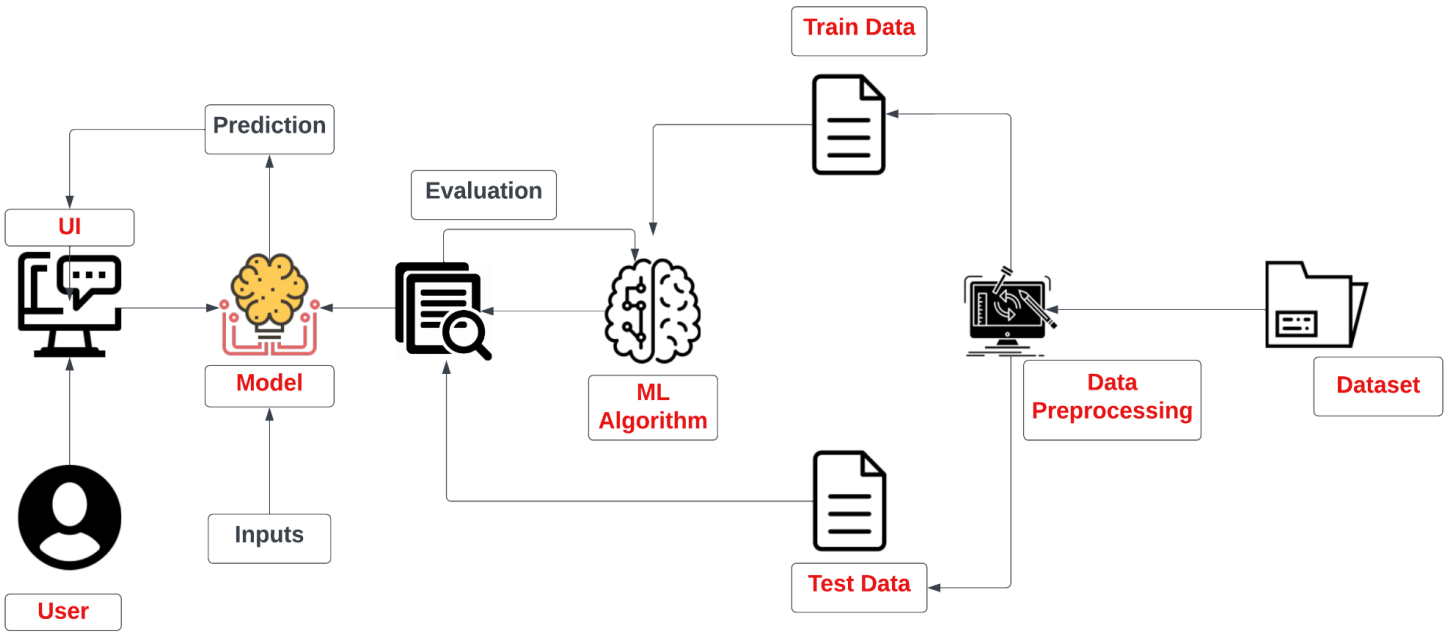
Solution Architecture:

The Sleep Oracle system employs a range of machine learning models, including Random Forest, Decision Tree, XGBoost, and Logistic Regression, to analyze structured sleep health and lifestyle data. It predicts and optimizes sleep patterns, refines sleep quality, and provides personalized recommendations. The system's continuous learning loop ensures accuracy and adaptability, offering a comprehensive solution for sleep health management.

Our solution leverages different Machine Learning (ML) Algorithms to address the Sleep Disorder classification problem effectively.

- Data Gathering
- Data Preprocessing
- Model Building
- Sleep Disorder Prediction
- Real Time Analysis

Solution Architecture Diagram:



Data collection and preprocessing: The first step is to collect a dataset that is relevant to the machine learning task. Once the data is collected, it needs to be cleaned and preprocessed to make it suitable for training the model. This may involve removing outliers, correcting errors, and converting the data into a format that the machine learning algorithm can understand.

Model selection and training: Once the data is ready, the next step is to select a machine learning algorithm and train the model. There are many different types of machine learning algorithms, each with its own strengths and weaknesses. The best algorithm to use will depend on the specific machine learning task and the type of data that is available.

Model evaluation: Once the model is trained, it is important to evaluate its performance on a held-out test set. This will help to identify any potential overfitting and ensure that the model is able to generalize well to new data.

Model deployment: Once the model is evaluated and deemed to be satisfactory, it can be deployed to production. This means making the model available to users so that they can make predictions or decisions based on the model's output.

The diagram also shows some of the key components involved in the machine learning process, such as:

Inputs: The inputs to the machine learning model are the data that the model uses to learn and make predictions.

Model: The model is a set of rules or parameters that the machine learning algorithm learns from the data.

ML Algorithm: The machine learning algorithm is the process that the machine learning model uses to learn from the data and generate the model.

Prediction: The prediction is the output of the machine learning model. It is the answer to the question that the model is trying to solve.

Evaluation: The evaluation is the process of assessing the performance of the machine learning model on a held-out test set.

UI: The UI (user interface) is the way that users interact with the machine learning model. It may be a simple web page or a complex software application.