**Introduction:**

Heart disease is a major public health concern, accounting for a significant number of deaths worldwide. Early detection and accurate diagnosis of heart disease can significantly improve patient outcomes and reduce healthcare costs. In recent years, machine learning (ML) models have shown great promise in predicting the risk of heart disease, leveraging various clinical and demographic features to provide accurate predictions.

In this study, we present a heart disease prediction model that utilizes a combination of clinical and demographic features, sleep cycle data, and electrocardiogram (ECG) reports for analysis. We obtained the data from the UCI Heart Disease Dataset, which contains 76 attributes, including age, sex, cholesterol levels, and blood pressure measurements, among others. We augmented the dataset with sleep cycle data and ECG reports to enhance the accuracy of our predictions.

Sleep cycle data was obtained from wearable devices that collected information on the duration and quality of sleep of the patients. This data was incorporated into our model to capture the relationship between sleep patterns and heart disease. We also used ECG reports to capture the electrical activity of the heart and detect any abnormalities, which were then used as features for our model.

Our model is based on a multiple-model system, which employs various ML algorithms to predict the likelihood of heart disease in patients. We used parameter hyper-tuning techniques to optimize the performance of our model and ensure that it achieved the highest possible accuracy. The multiple-model system enabled us to leverage the strengths of different ML algorithms, ensuring that our model was robust and effective.

The results of our study demonstrate the effectiveness of our heart disease prediction model, which achieved high accuracy in predicting the likelihood of heart disease in patients. Our model has the potential to revolutionize the field of heart disease prediction, providing clinicians with a powerful tool for early detection and diagnosis of heart disease.