AIKTC – Anjuman-I-Islam's Kalsekar Technical Campus.
Department of Computer Engineering

TE Mini Project-2A

On

"Heart Disease Prediction System"

By

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Introduction

- Heart disease is one of the leading causes of death globally. This project focuses on developing a prediction system that uses machine learning algorithms to identify potential heart conditions early

Objective

- To predict the presence of heart disease using clinical data
- To improve early diagnosis and preventive care.
- To assist healthcare professionals with reliable decision-making.

Dataset Overview

- The dataset consists of patient records with features such as age, cholesterol, and blood pressure.
- Typically sourced from public datasets like UCI Machine Learning Repository.
- Contains both input features and target labels indicating the presence of heart disease.

Key Features in Prediction

- Age
- Gender
- Fasting Blood Sugar
- Blood Pressure
- Cholesterol Levels
- Heart Rate
- Presence of Chest Pain

Machine Learning Algorithms Used

- Logistic Regression
- Decision Trees
- Random Forest
- Support Vector Machine (SVM)
- Neural Networks

System Architecture

1. Data Collection: Clinical and diagnostic data.
2. Preprocessing: Cleaning and transforming the data.
3. Model Training: Applying machine learning algorithms.
4. Prediction: Predict the presence of heart disease.
5. Evaluation: Assess model performance using metrics.

Evaluation Metrics

- Accuracy: Percentage of correctly predicted instances.
- Precision: Ratio of true positives to predicted positives.
- Recall: Sensitivity or true positive rate.
- F1 Score: Harmonic mean of precision and recall.

Results

- The system achieved high accuracy with Random Forest and SVM models.
- Results show promise in aiding medical professionals in diagnosing heart diseases early.

Challenges and Limitations

- Limited availability of quality data.
- Data imbalance can affect prediction.
- Interpretability of complex models such as neural networks.

Conclusion

- The Heart Disease Prediction System demonstrates the potential of machine learning in healthcare. With proper data and fine-tuning, it can support clinicians in making early diagnoses and improve patient outcomes.

References

- UCI Machine Learning Repository
- Research papers on heart disease prediction
- Healthcare industry reports on heart disease statistics
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Thank You