



HEART DISEASE PREDICTION


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Introduction

- MachineLearning project to predict heart disease.
 - Importance: Heart disease is common and dangerous.
 - Early prediction helps in prevention and education.
 - We aim to create a **user-friendly prediction tool** using real patient data
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Problem Statement

- **Early detection of heart disease is challenging.**
 - **Doctors rely on multiple medical tests that may take time.**
 - **There is a need for an automated and accurate prediction system to support medical professionals.**
 - **Our goal is to build a model that** predicts heart disease from patient attributes.
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Dataset & Features

Dataset Source: UCI Machine Learning Repository.

- Main Features:
- Age, Sex, Chest Pain Type (cp)
- Resting Blood Pressure (trestbps), Cholesterol (chol)
- Fasting Blood Sugar (fbs), Max Heart Rate (thalach)
- Exercise Induced Angina (exang), Oldpeak, Slope, Ca, Thal
- Use bullets or a small table for clarity.



Methodology :

• Data Preprocessing

- Handling missing values
- Label encoding & one-hot encoding
- Feature scaling

☐ Exploratory Data Analysis (EDA)

- Understanding distributions and correlations

☐ Train/Test Split

- 80% training, 20% testing

☐ Model Training

- Logistic Regression
- Random Forest
- SVM
- KNN
- XGBoost (optional)

☐ Evaluation & Model Selection

- Accuracy
- Precision, Recall, F1-score
- Confusion Matrix

Models Used

- Logistic Regression
- Random Forest
- Support Vector Machine (SVM)
- K-Nearest Neighbors (KNN)
- XGBoost Classifier





Results

- Best Model: Random Forest Classifier
- Accuracy: ~90%



Future Work Improvements

- Explore advanced algorithms (XGBoost, Neural Networks)
- Improve feature engineering
- Enhance Streamlit interface
- Deploy the application online



Application Demonstration

- . A **Streamlit web application** was developed.
- . Users can input medical details (e.g., age, cholesterol, BP).
- . The app returns:
 - ✓ **Prediction (Disease / No Disease)**
 - ✓ **Probability score**
- . The model is deployed online for easy access and real-time use.





THANK YOU

