

# HEART DISEASE PREDICTION

Tariq Mohammed Abuzied Mozen-	202404010033
Abdalrahman Mohamedalami Margani mahmous	202409010070
Mustafa Mohamed Abdelmatlab Osman-	202401010552
NAZMUL ISLAM AYON	202410010027

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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

# 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.



# Dataset & Features

Dataset Source: UCIMachine 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**

