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| **HEART FAILURE PREDICTION** |

**Aim**

The goal of this project is to develop a robust and accurate predictive model for heart disease detection using various machine learning algorithms. By leveraging a diverse dataset of medical features, our objective is to uncover patterns that contribute to the presence or absence of heart disease. The primary aim is to create a model that empowers healthcare professionals to make informed decisions based on patient data, facilitating early detection and intervention for individuals at risk of heart disease. Ultimately, our project strives to make a meaningful contribution to improved patient outcomes and the prevention of cardiovascular issues through effective machine learning-based prediction.

**Background**

Cardiovascular diseases (CVDs) pose a significant global health concern, accounting for a substantial number of annual deaths. Encompassing conditions such as heart attacks, strokes, and heart failure, CVDs are a leading cause of premature mortality with a far-reaching impact. Many of these deaths are preventable or manageable with early detection and appropriate interventions.

**Tool Used**

Python

**Data Description**

The raw dataset used in this project comprises 12 columns, including the target variable, and a total of 918 records.

**Attribute Information:**

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| **Attribute** | **Description** | **Format / Values** |
| Age | Age of the patient | Numeric value in years |
| Sex | Sex of the patient | M: Male, F: Female |
| ChestPainType | Chest pain type | TA: Typical Angina, ATA: Atypical Angina, NAP: Non-Anginal Pain, ASY: Asymptomatic |
| RestingBP | Resting blood pressure | Numeric value in mm Hg |
| Cholesterol | Serum cholesterol | Numeric value in mg/dl |
| FastingBS | Fasting blood sugar | 1: if FastingBS > 120 mg/dl, 0: otherwise |
| RestingECG | Resting electrocardiogram results | Normal: Normal, ST: having ST-T wave abnormality (T wave inversions and/or ST elevation or depression of > 0.05 mV), LVH: showing probable or definite left ventricular hypertrophy by Estes' criteria |
| MaxHR | Maximum heart rate achieved | Numeric value between 60 and 202 |
| ExerciseAngina | Exercise-induced angina | Y: Yes, N: No |
| Oldpeak | Oldpeak = ST (Numeric value measured in depression) | Numeric value |
| ST\_Slope | The slope of the peak exercise ST segment | Up: upsloping, Flat: flat, Down: downsloping |
| HeartDisease | Output class | 1: heart disease, 0: Normal |

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