**CORONARY ARTERY DISEASE PREDICTION STUDY**

**Columns:**

14 attributes used:

1. #3 (age) 8. #32 (thalach)

2. #4 (sex) 9. #38 (exang)

3. #9 (cp) 10. #40 (oldpeak)

4. #10 (trestbps) 11. #41 (slope)

5. #12 (chol) 12. #44 (ca)

6. #16 (fbs) 13. #51 (thal)

7. #19 (restecg) 14. #58 (num)Only 14 attributes used:

**Details of the column**

1. **age:** age in years
2. **sex** (1 = male; 0 = female)
3. **cp: chest pain type**
   * Value 1: **Typical angina** (chest pain from heart problems like blocked arteries)
   * Value 2: **Atypical angina** (chest pain not directly from heart problems)
   * Value 3: **Non-anginal pain** (chest pain not related to heart issues)
   * Value 4: **Asymptomatic** (no chest pain)
4. **trestbps(resting blood pressure):** This is the patient's blood pressure when they're at rest, measured in mm Hg. High blood pressure can indicate heart problems.
5. **chol:** This is the cholesterol level in the blood, measured in mg/dl. High cholesterol increases the risk of heart disease.
6. **fbs:** Whether the patient's fasting blood sugar is above 120 mg/dl.(fasting blood sugar > 120 mg/dl) (1 = true[high]; 0 = false[normal] )
7. **thalach (maximum heart rate achieved)**: The highest heart rate the patient reached during tests. Lower heart rates could indicate heart issues.
8. **restecg:** resting electrocardiographic results
   * + Value 0: normal
     + Value 1: Abnormality in the heart's T wave (indicating heart issues)
     + Value 2: Possible left ventricular hypertrophy (thickening of the heart's left ventricle)
9. **exang:** Whether the patient has chest pain during exercise. ( 1 = Yes (chest pain during exercise) , 0 = No (no chest pain during exercise)
10. **oldpeak** = The ST depression caused by exercise compared to rest. It's a measure used in electrocardiograms to see if the heart is working harder than normal.
11. **slope:** the slope of the peak exercise ST segment
    * Value 1: Upsloping (healthier heart response)
    * Value 2: Flat (possible issues)
    * Value 3: Downsloping (indicates higher risk of heart problems)
12. **Ca-(number of major vessels):** The number of major blood vessels (0-3) colored by fluoroscopy (a technique to see blood flow). More blocked vessels can indicate a higher chance of heart disease.
13. **thal (**Describes the patient's thallium stress test results.**)** 
    * 3 = Normal (healthy blood flow)
    * 6 = Fixed defect (part of the heart muscle is permanently damaged)
    * 7 = Reversible defect (part of the heart muscle has temporary damage)

**Target Variable:**

1. **num (diagnosis of heart disease):** This is the target variable, showing whether the patient has heart disease.
   * **Target 1**: No heart disease (healthy or very mild narrowing of arteries)
   * **Target 2**: Mild heart disease (some narrowing of arteries, but less severe)
   * **Target 3**: Moderate heart disease (higher artery narrowing, but treatable)
   * **Target 4**: Severe heart disease (significant artery narrowing, requiring urgent intervention)