Heart Disease Analysis

- Business Issues considered
- About Dataset
- Data Exploration
- Inferential Analysis
- Interpretation and Recommendations

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Phase 2 Project- Flatiron School

Business Problem

Efficient Diagnosis and Risk Stratification of Heart Disease in Cardiac patients

Stakeholder: Cardiology Department at a Healthcare Facility

Dataset

UCI Heart Disease Dataset (from UCI repository)

- It has Patient data from Cleveland hospital

- It is composed of 14 attributes:

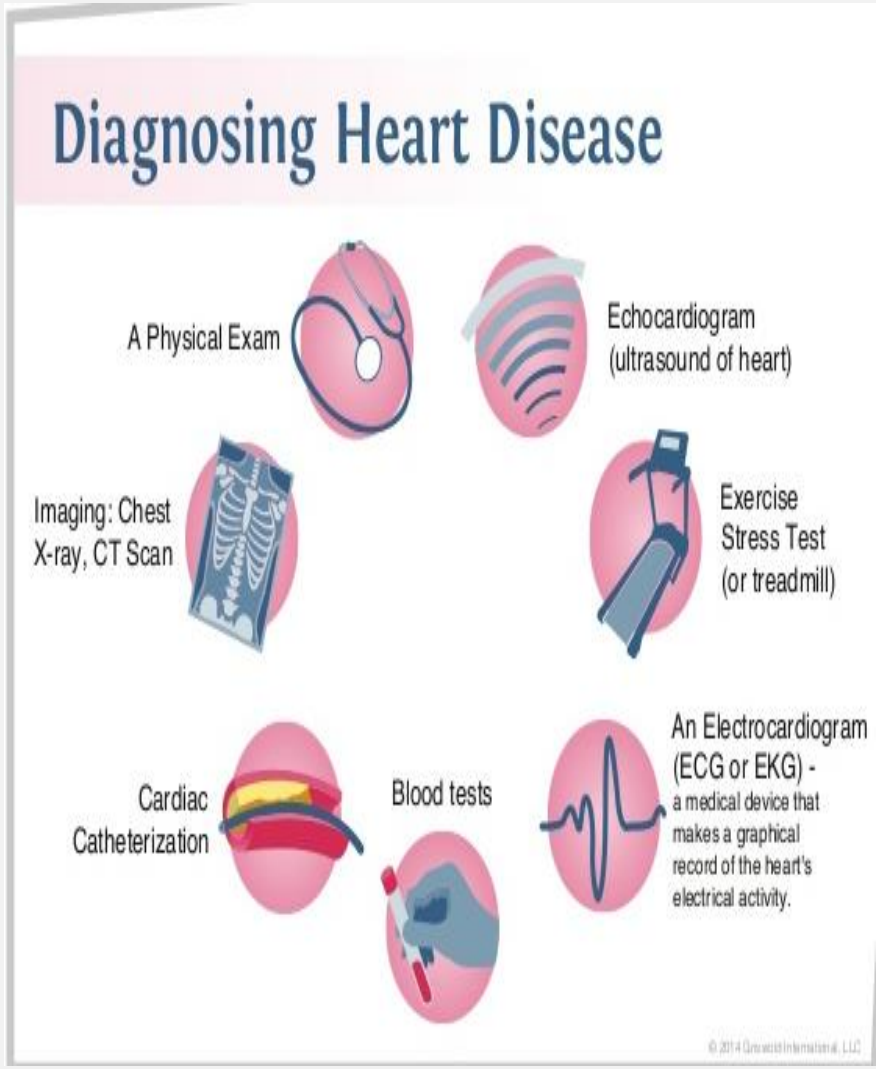
age, sex, chest pain type,

resting blood pressure, serum cholesterol, fasting blood sugar,

resting electrocardiographic results,

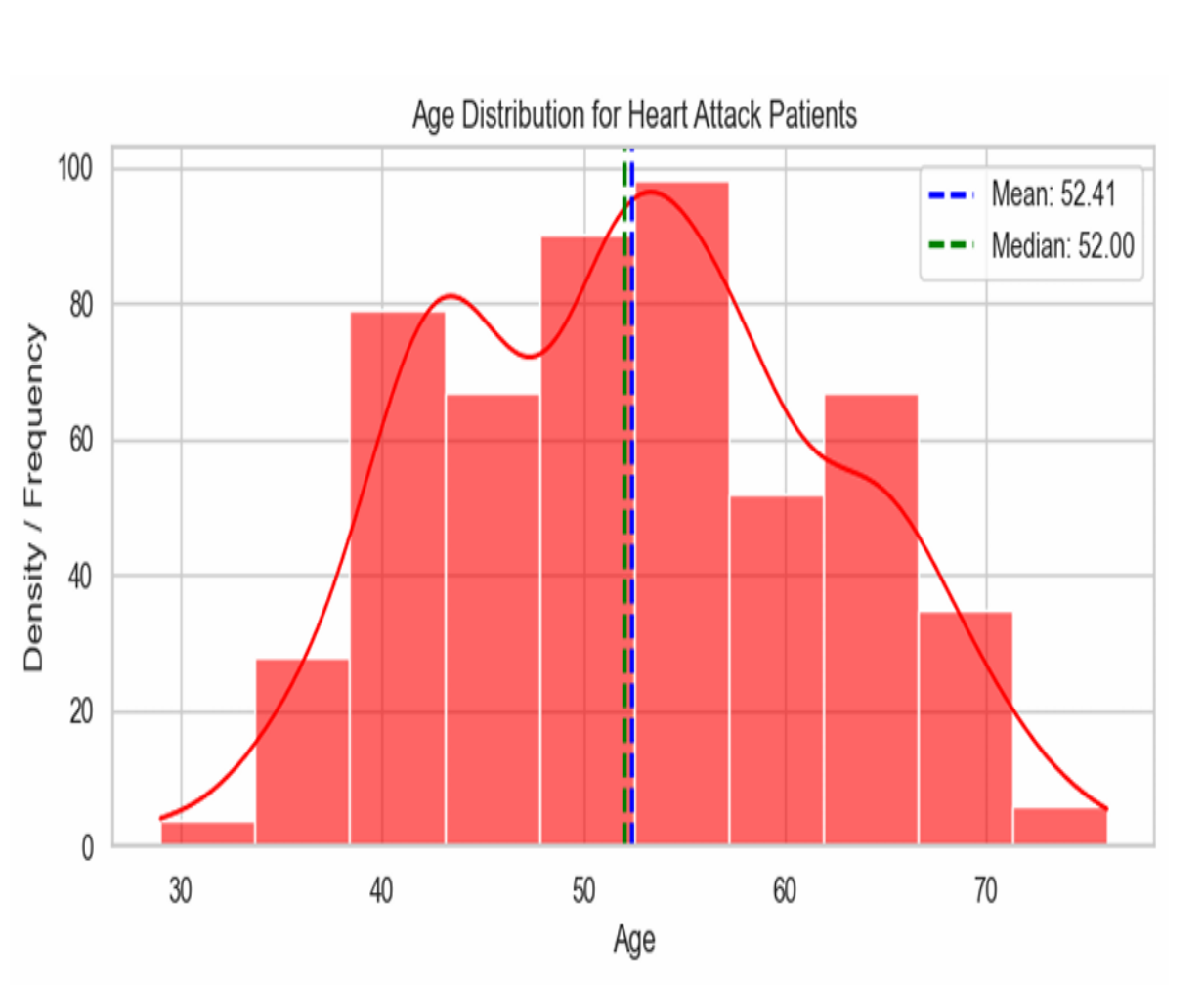
maximum heart rate achieved, exercise-induced angina, oldpeak (ST depression induced by exercise relative to rest),

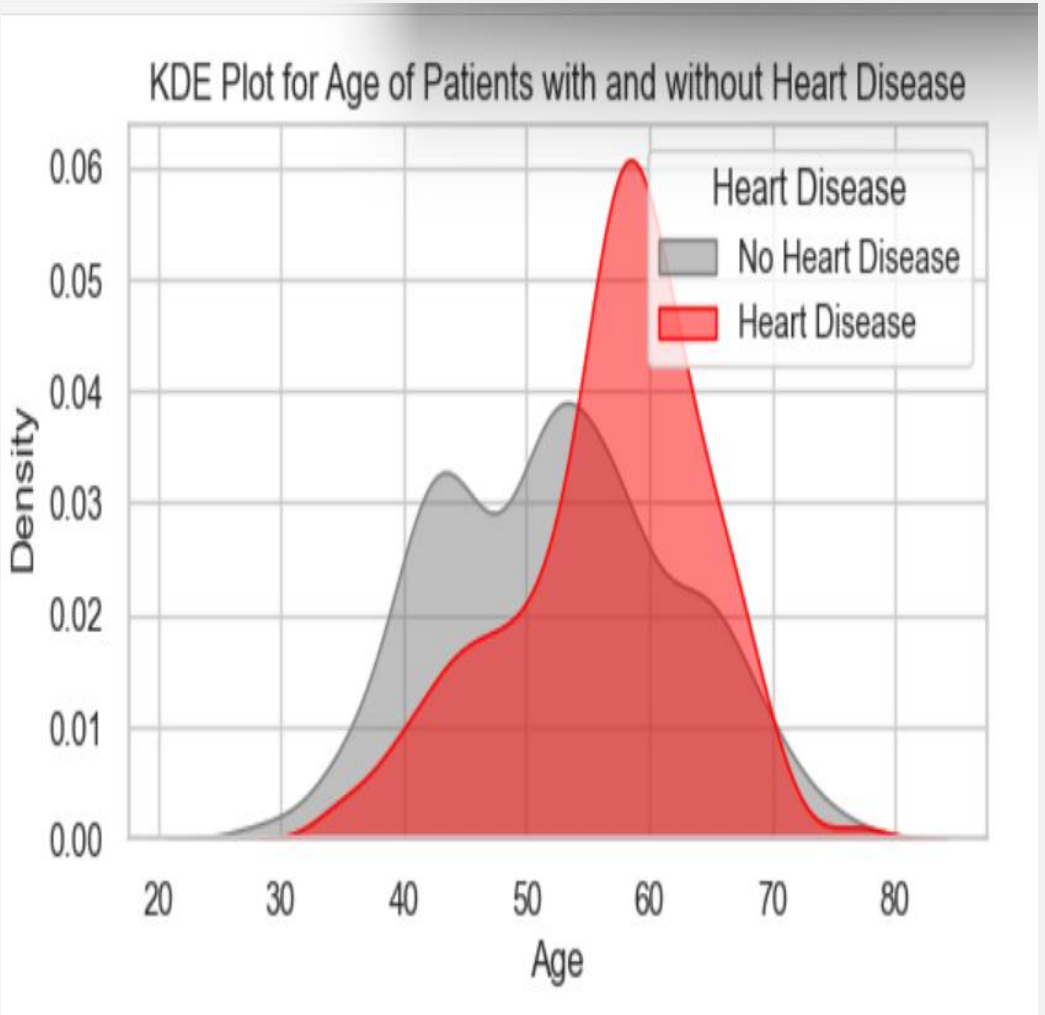
slope (the slope of the peak exercise), number of major vessels and Thalassemia.

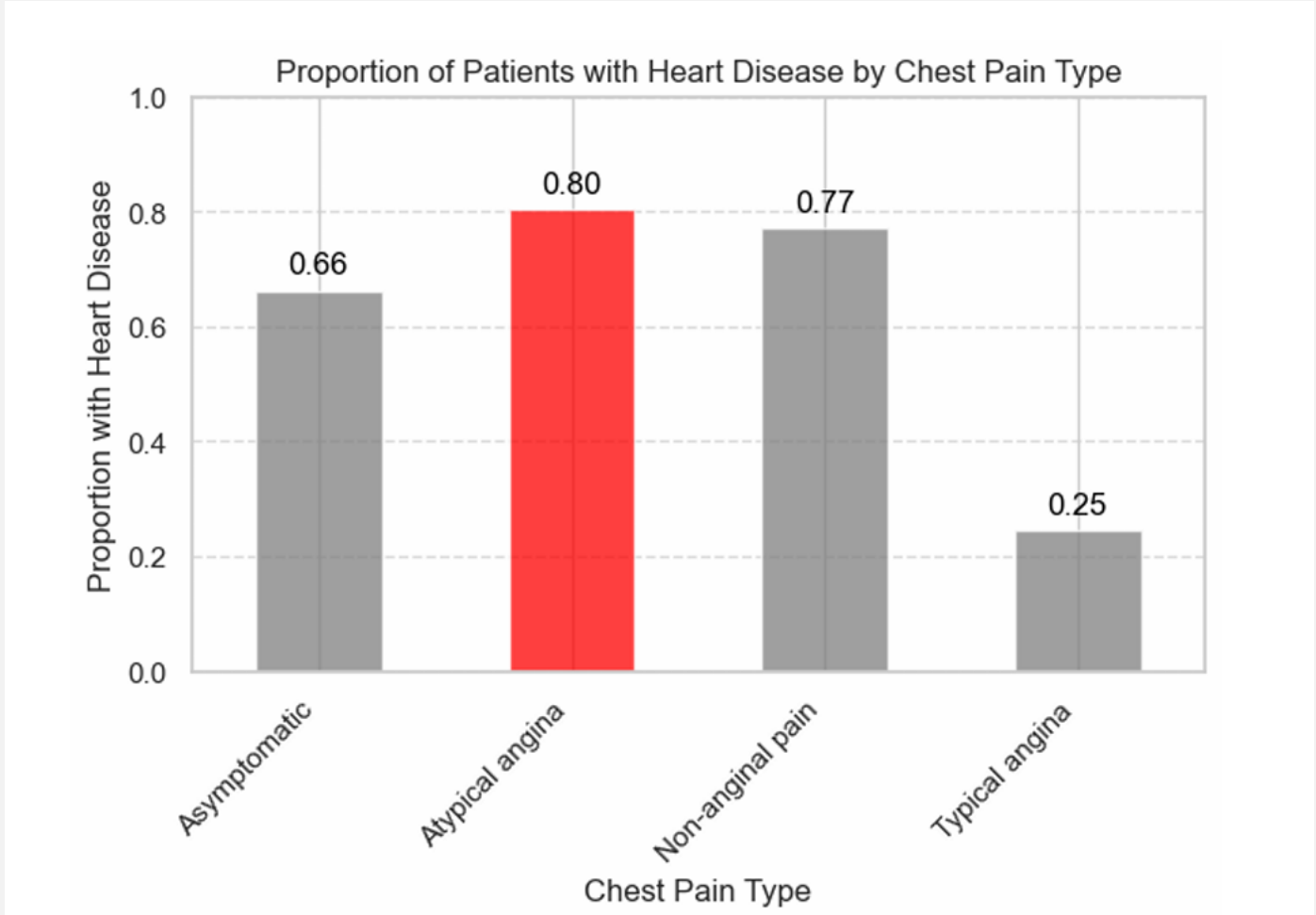


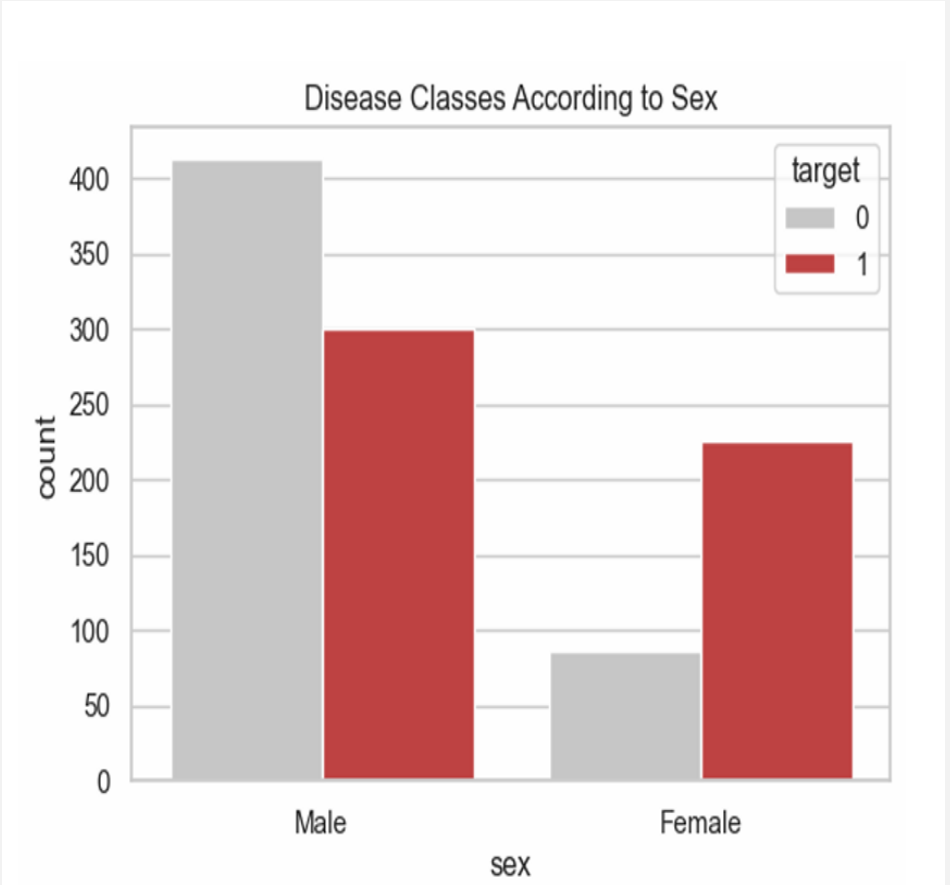
Findings

- The minimum age with a heart disease is 29 yrs and the maximum is 77 yrs per the data set.
- Most people get heart disease between 52 - 53 yrs age.
- Age - The older age increases the heart diseases.risk of narrowing arteries.
- High Blood pressure and Cholesterol are risk factors for heart disease.
- Gender: Men are at higher risk.
- Individuals with atypical angina are at risk for heart attacks if their condition goes unrecognized or untreated.


Age Distribution for Heart Attack Patients
Mean: 52.41
Median: 52.00
Density / Frequency
Age
0
20
40
60
80
100
30
40
50
60
70


KDE Plot for Age of Patients with and without Heart Disease
Heart Disease
No Heart Disease
Heart Disease
Density
Age
0.00
0.01
0.02
0.03
0.04
0.05
0.06
20
30
40
50
60
70
80


Proportion of Patients with Heart Disease by Chest Pain Type
Proportion with Heart Disease
1.0
0.8
0.6
0.4
0.2
0.0
0.66
0.80
0.77
0.25
Asymptomatic
Atypical angina
Non-anginal pain
Typical angina
Chest Pain Type


Disease Classes According to Sex
target
0
1
count
400
350
300
250
200
150
100
50
0
Male
Female
sex

Inferential Analysis Results

- There is a statistically significant association between gender and the incidence of heart disease.
  (Chi square hypothesis test is performed)

- There is a significant difference in age distributions between patients with and without heart disease.
  (Mann-Whitney test is performed)

- There is a statistically significant association between different types of chest pain and the heart disease occurrence among patients with
  (Chis square test is performed)

Insights & Recommendations:

Preventing Severe Cardiac Events by Early identification and intervention: Can reduce the incidence of severe cardiac events, leading to better patient outcomes and reduced healthcare costs.

Personalizing Treatment Plans: Understanding the risk level can guide physicians in tailoring treatment plans based on individual patient profiles.

Identifying High-Risk Patients: We can prioritize patients who may require immediate attention and further diagnostic testing.

Data-driven approach to enhance the accuracy of diagnosis and improve patient outcomes.