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# Heart Disease Diagnostic Analysis

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Detailed Project Report

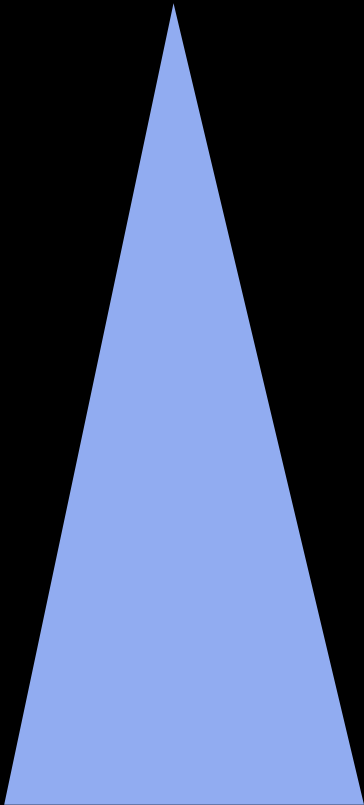
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# PROJECT DETAIL

PROJECT TITLE	: HEART DISEASE DIAGNOSTIC ANALYSIS
TECHNOLOGY	: BUSINESS INTELLIGENCE
DOMAIN	: HEALTHCARE
PROJECT DIFFICULTY LEVEL	: ADVANCE
PROGRAMMING LANGUAGE USED	: PYTHON
TOOLS USED	: JUPYTER NOTEBOOK, MS-EXCEL

# OBJECTIVE

- The goal of this project is to analyze the heart disease occurrence, based on a combination of features that describes the heart disease.



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# PROBLEM STATEMENT

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- During the pandemic time we realized that health is the true wealth and the Covid-19 had brute effects on all irrespective of any status. We are required to analyse this health and medical data for better future preparation.
- A dataset is formed by taking into consideration some of the information of 303 individuals.

# ARCHITECTURE

REAL WORLD



RAW DATA COLLECTION

IMPORTING LIBRARIES  
IN JUPYTER NOTEBOOK

LOAD DATABASE

DATA CLEANING

HANDLING OUTLIERS

MISSING VALUE  
IMPUTATIONS

Data Pre-processing

EXPLORATORY DATA  
ANALYSIS (EDA)

MODELLING

POWERBI DESKTOP

DEPLOYMENT

INSIGHTS

REPORTING

- . Low level design document
- . High level design document
- . Wireframe document
- . Architecture document

# DATASET INFORMATION

- **age:** The person's age in years
- **sex:** The person's sex (1 = male, 0 = female)
- **cp:** The chest pain experienced (Value 1: typical angina, Value 2: atypical angina, Value 3: non-anginal pain, Value 4: asymptomatic)
- **trestbps:** The person's resting blood pressure (mm Hg on admission to the hospital)
- **chol:** The person's cholesterol measurement in mg/dl
- **fbs:** The person's fasting blood sugar (> 120 mg/dl, 1 = true; 0 = false)
- **restecg:** Resting electrocardiographic measurement (0 = normal, 1 = having ST-T wave abnormality, 2 = showing probable or definite left ventricular hypertrophy by Estes' criteria)
- **thalach:** The person's maximum heart rate achieved
- **oldpeak:** ST depression induced by exercise relative to rest
- **exang:** Exercise induced angina (1 = yes; 0 = no)
- **slope:** the slope of the peak exercise ST segment (Value 1: upsloping, Value 2: flat, Value 3: down sloping)
- **ca:** The number of major vessels (0-3)
- **thal:** A blood disorder called thalassemia (3 = normal; 6 = fixed defect; 7 = reversable defect)
- **num:** Heart disease (0 = no, 1 = yes)

# Why These Parameters are Important?

- **Age:** Age is the most important risk factor in developing cardiovascular or heart diseases, with approximately a tripling of risk with each decade of life. Coronary fatty streaks can begin to form in adolescence. It is estimated that 82 percent of people who die of coronary heart disease are 65 and older. Simultaneously, the risk of stroke doubles every decade after age 55.
- **Sex:** Men are at greater risk of heart disease than pre-menopausal women. Once past menopause, it has been argued that a woman's risk is similar to a man's although more recent data from the WHO and UN disputes this. If a female has diabetes, she is more likely to develop heart disease than a male with diabetes.
- **Resting Blood Pressure:** Over time, high blood pressure can damage arteries that feed your heart. High blood pressure that occurs with other conditions, such as obesity, high cholesterol or diabetes, increases your risk even more.
- **Fasting Blood Sugar:** Not producing enough of a hormone secreted by your pancreas (insulin) or not responding to insulin properly causes your body's blood sugar levels to rise, increasing your risk of heart attack.
- **Cholesterol:** A high level of low-density lipoprotein (LDL) cholesterol (the "bad" cholesterol) is most likely to narrow arteries. A high level of triglycerides, a type of blood fat related to your diet, also ups your risk of heart attack. However, a high level of high-density lipoprotein (HDL) cholesterol (the "good" cholesterol) lowers your risk of heart attack.
- **Resting ECG:** For people at low risk of cardiovascular disease, the USPSTF concludes with moderate certainty that the potential harms of screening with resting or exercise ECG equal or exceed the potential benefits. For people at intermediate to high risk, current evidence is insufficient to assess the balance of benefits and harms of screening.
- **Max heart rate achieved:** The increase in the cardiovascular risk, associated with the acceleration of heart rate, was comparable to the increase in risk observed with high blood pressure. It has been shown that an increase in heart rate by 10 beats per minute was associated with an increase in the risk of cardiac death by at least 20%, and this increase in the risk is similar to the one observed with an increase in systolic blood pressure by 10 mm Hg.
- **ST Depression:** In unstable coronary artery disease, ST-segment depression is associated with a 100% increase in the occurrence of three-vessel/left main disease and to an increased risk of subsequent cardiac events. In these patients an early invasive strategy substantially decreases death/myocardial infarction.

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# KEY PERFORMANCE INDICATORS(KPIs)

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1. Percentage of People Having Heart Disease
2. Age Distribution including Gender
3. Gender Distribution Based on Heart Disease
4. Chest Pain Experienced by People Suffering from Heart Disease
5. Blood Pressure, Cholesterol Level and Maximum Heart Rate of People According to their Age and Heart Disease Patients.
6. ST Depression Experienced by People According to their age and gender.



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# INSIGHTS/CONCLUSION

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1. From the overall population, 49% people have heart disease and 51% people do not have heart disease
2. Elder Age People are most affected by Heart Disease & Young Age People are mostly FREE from any kind of Disease
3. Males are seen more prone to Heart Disease
4. People having atypical angina have higher chance of heart disease
5. Higher Number of Asymptomatic Pain is seen in Elderly Age people.
6. Higher number of men are suffering from Asymptomatic type of Chest Pain
7. Blood Pressure Rate is almost equal in Males and Females
8. Blood pressure increases between age of 50 to 60 and continue till 70
9. Cholestrol levels are higher in females than males
10. Cholestrol level increases after age 50
11. ST Depression is seen more in males than in females
12. ST depression is more in ages 30-40
13. Higher Blood Pressure Level results in higher chances of heart disease
14. More chances of disease is seen in more fasting blood sugar levels
15. Males are generally seen to have higher level of Fasting Blood Sugar
16. It is seen that males have high level of Exercise Based Agnia

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THANK YOU

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