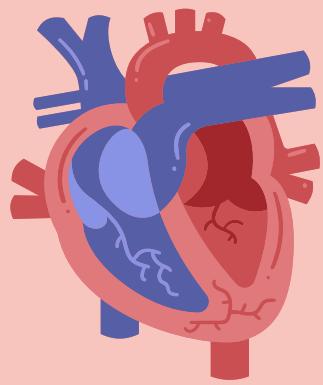


# HEART FAILURE PREDICTION

Presented by :

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# INTRODUCTION AND CONTEXT



## Why predict Heart disease ?

- Leading cause of death worldwide (~17.9 million deaths per year).
- Early detection = better prevention & treatment.
- AI can help doctors identify at-risk patients efficiently.

## Dataset Overview

- 918 patients with 12 medical variables.
- Goal: Predict if a patient has heart disease (1) or not (0).
- Key features: Age, Sex, Cholesterol, Chest Pain Type, etc.

# **OUTLINE OF OUR PRESENTATION**

- 1. Data Analysis - Notebook**
- 2. Modélisation et Prédition**
- 3. Conclusion et Discussion**

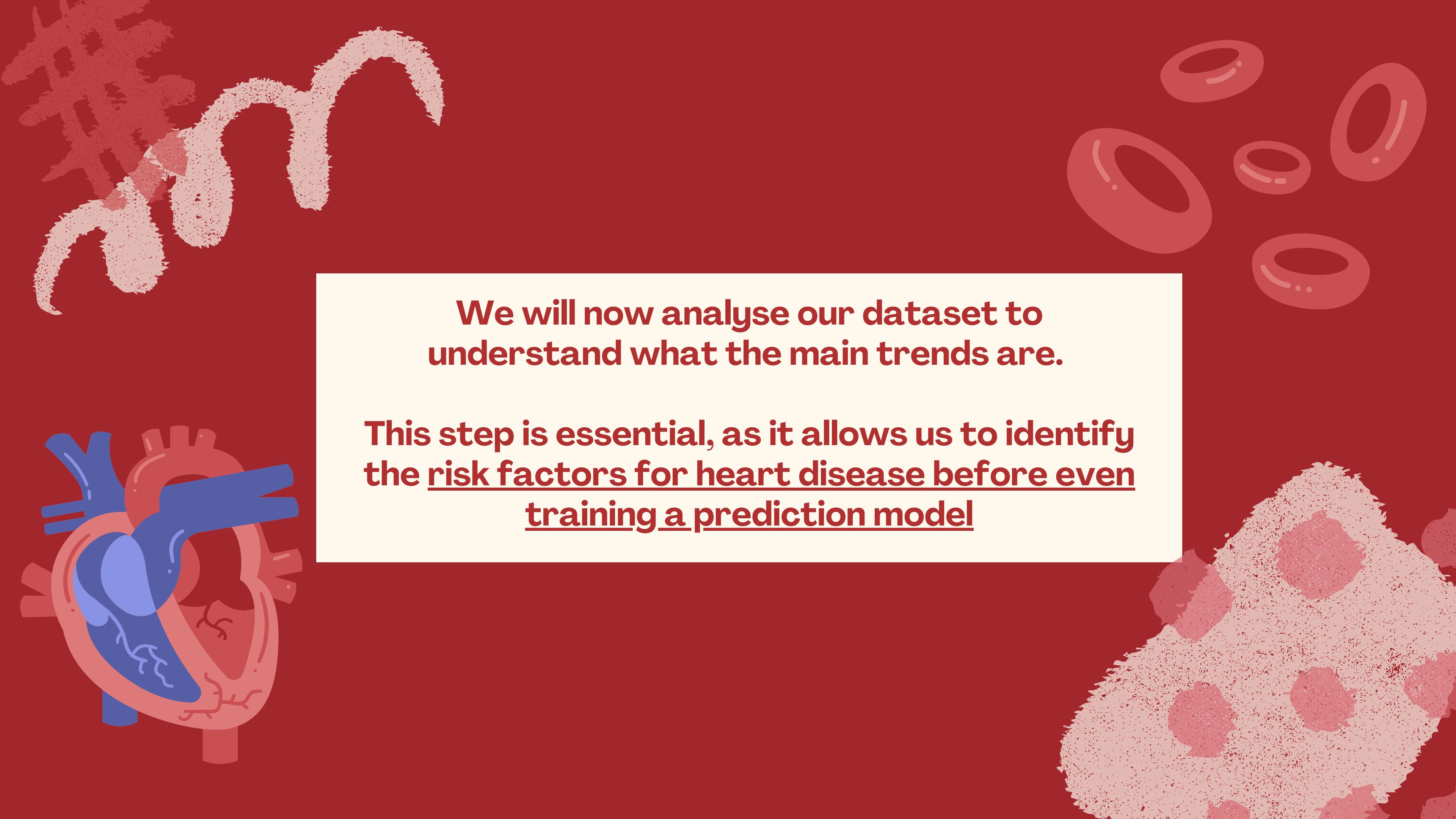
# DATA ANALYSIS NOTEBOOK

## Data card

<https://www.kaggle.com/datasets/fedesoriano/heart-failure-prediction/data>

## Notebook

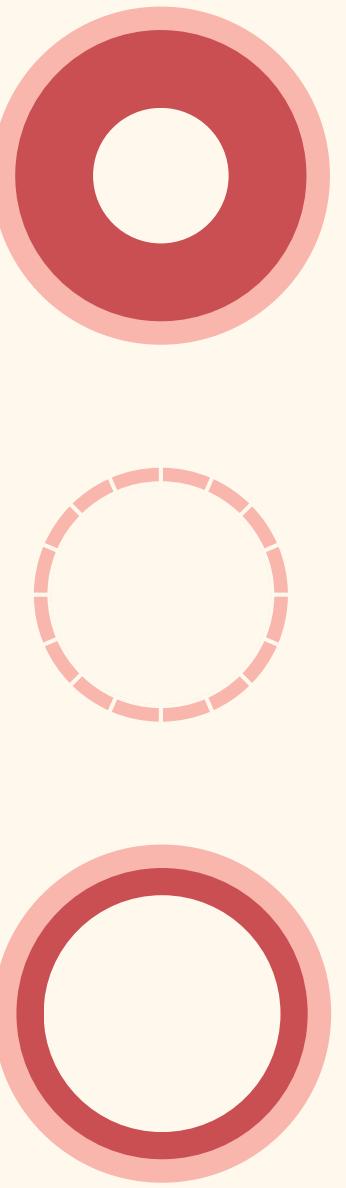
<https://www.kaggle.com/code/urgancegaur/a-guide-to-any-classification-problem>



We will now analyse our dataset to understand what the main trends are.

This step is essential, as it allows us to identify the risk factors for heart disease before even training a prediction model

# RESUME



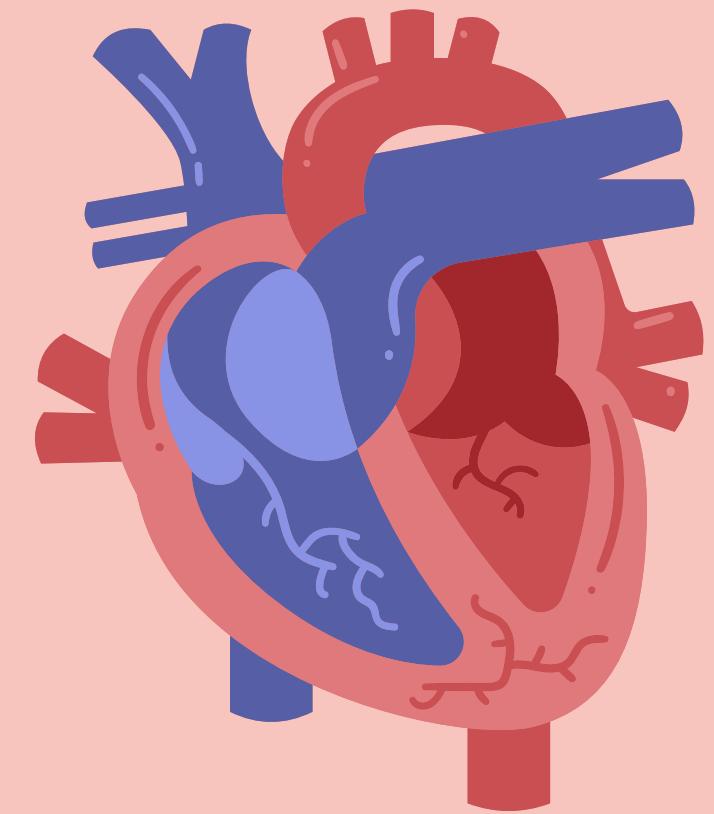
This exploratory analysis highlights the importance of variables such as age, fasting blood glucose, exercise angina and maximum heart rate, while revealing notable differences between men and women.

The attention paid to asymptomatic chest pain and extreme values will guide the next stages of data preparation and modelling.

# MODELISATION AND PREDICTION

In 5 steps :

1. Data preparation
2. Split the data to train the model
3. Model creation and training
4. Test the model and measure its accuracy
5. Conclusion



# RESUME

=> We now have a model capable of predicting whether a patient is at risk of heart disease.

## How did we achieve this?

- Data preparation
- AI model training
- Accuracy testing

**Important:** This model does not replace a doctor! It is just a tool to help detect at-risk cases.

# CONCLUSION : DISCUSSION

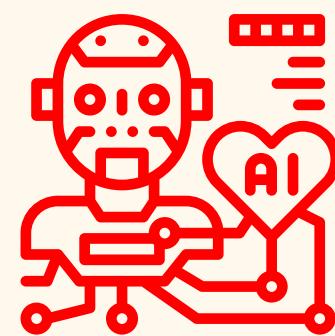
## Key Takeaways

- AI can help predict heart disease by analyzing patient data.
- Machine Learning (Random Forest) showed high accuracy in detecting risks.
- Early detection = better prevention & improved healthcare.

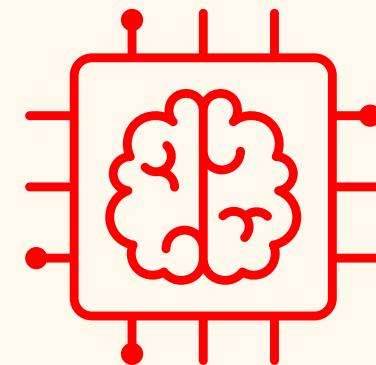
## Possible Improvements

- Enhance the dataset with more patient data for better accuracy.
- Explore advanced AI models like Neural Networks.
- Real-time detection for integration into healthcare systems.

# CONCLUSION : IMPORTANT NOTES



AI supports doctors, but does not replace them !



AI has immense potential to revolutionize healthcare.



Collaboration between AI & medical professionals is essential.

AI is shaping the future of healthcare, making it more accurate & accessible !

# DEFINITION

- **Panda** : A Python library used for data manipulation and analysis. It provides data structures like DataFrames and Series, making it easier to handle and process large datasets efficiently.
- **Machine Learning** : A branch of AI that enables systems to learn from data to make predictions.
- **Correlation** : A statistical measure indicating the relationship between two variables (positive, negative, or neutral)
- **Seaborn** : A Python library used for statistical data visualization.
- **Random Forest** : A machine learning algorithm based on multiple decision trees, used for classification and regression.