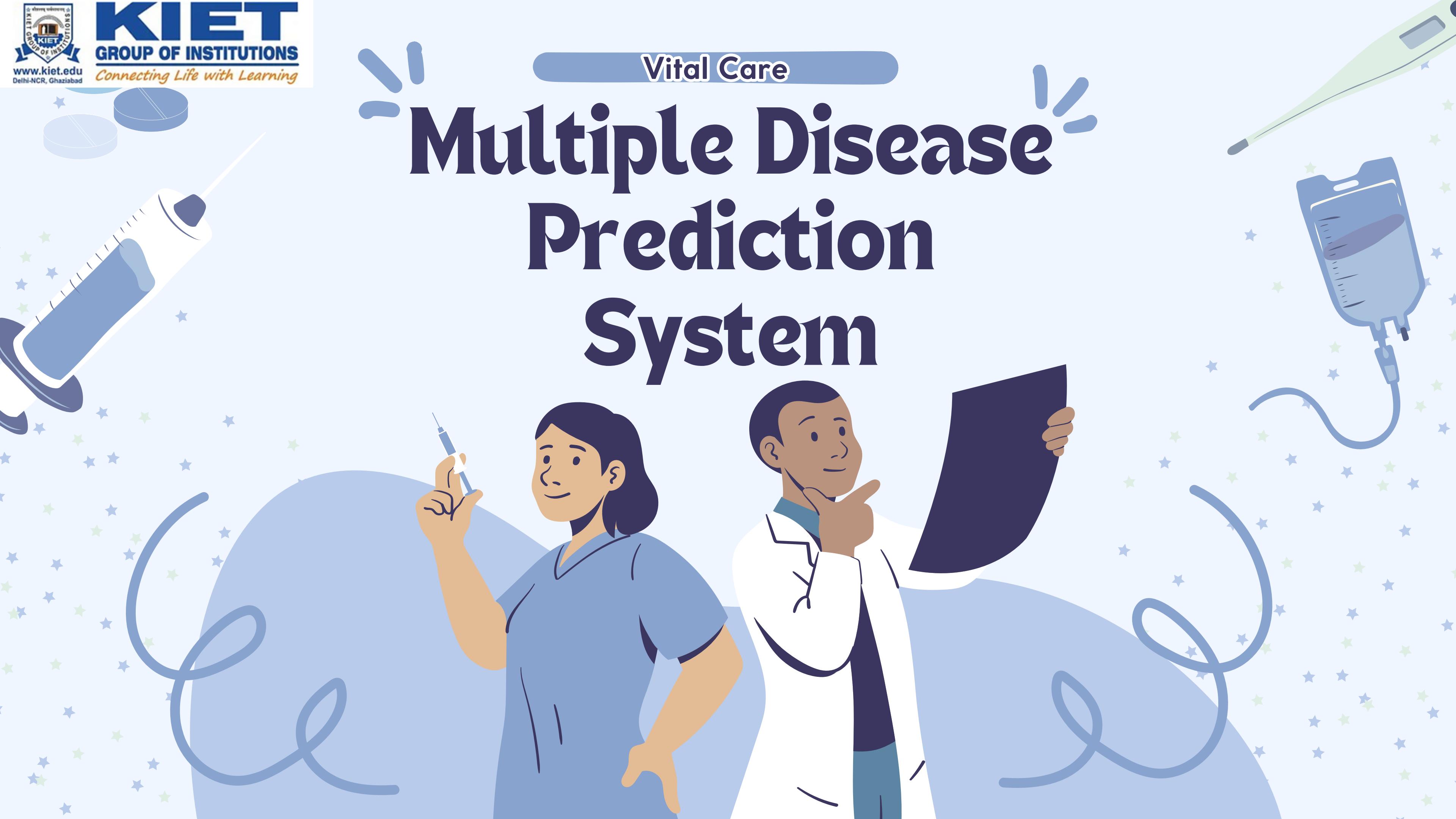


Vital Care

Multiple Disease Prediction System



Team Members

Guided by: Ms. Anjali Chauhan



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- 3** **Vaibhav Panjiyar**
- 4** **Vaishnav Yadav**

Project Abstract

Overview

This project develops a machine learning model to predict multiple diseases from patient data, addressing challenges in data complexity, multi-label classification, and interpretability.

Key Objectives

- Accurately predict multiple diseases.
- Ensure robustness across varied data.
- Improve model interpretability.
- Create a scalable solution for large, evolving datasets.

Approach

Use advanced machine learning to process diverse medical data, implement multi-label classification for interdependent diseases, and ensure scalability and interpretability for long-term adaptability.



Project Goals and Objectives

Accurate Prediction

Develop a machine learning model to predict multiple diseases with high precision based on patient features and medical test results.

Scalability

Design a model that can efficiently handle large datasets and accommodate new diseases or medical features.

Robustness

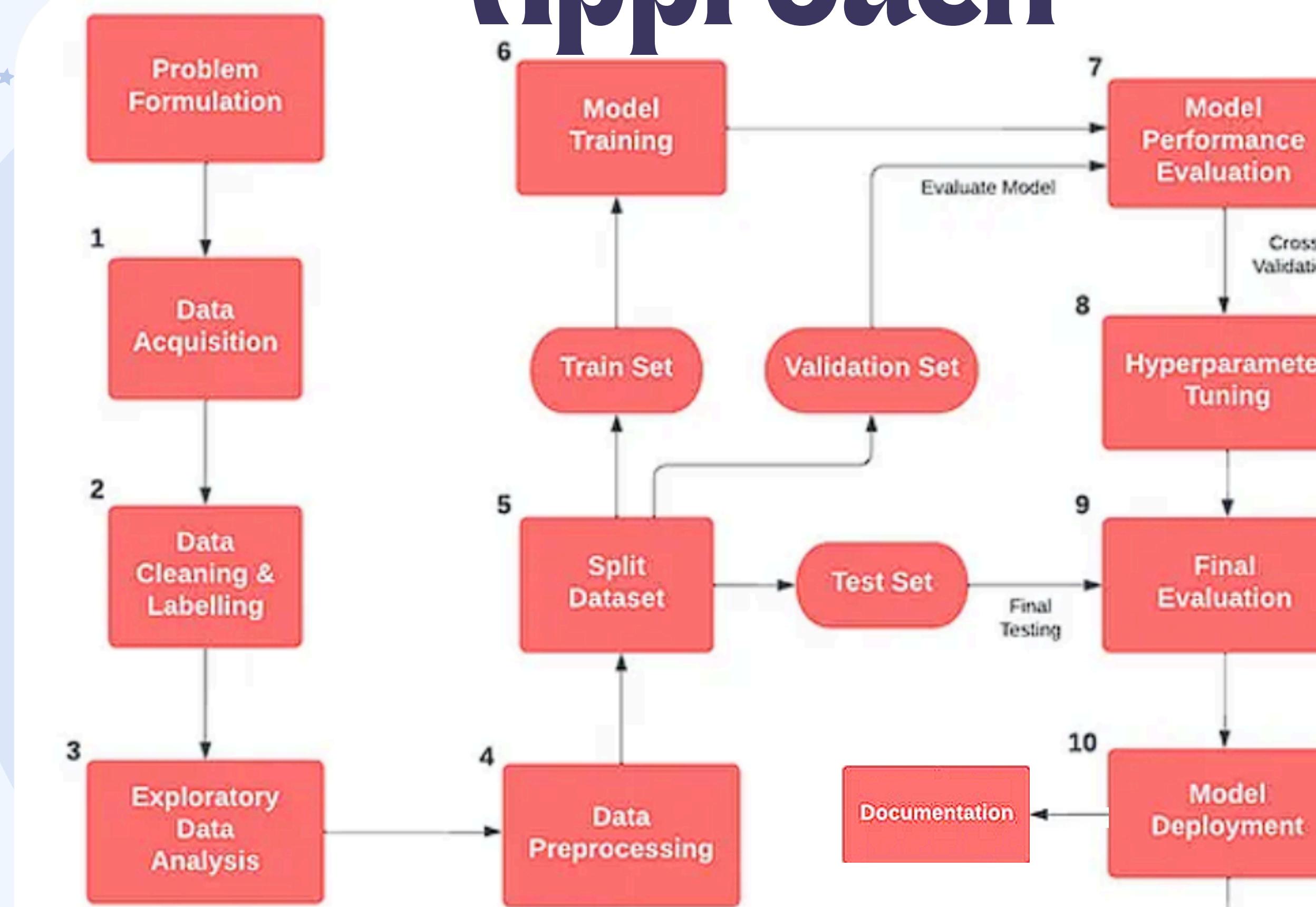
Ensure the model performs well across diverse data quality, distribution, and medical conditions.

Interpretability

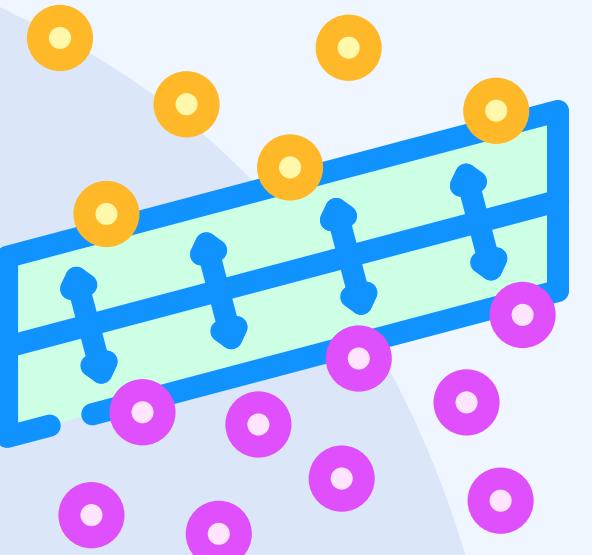
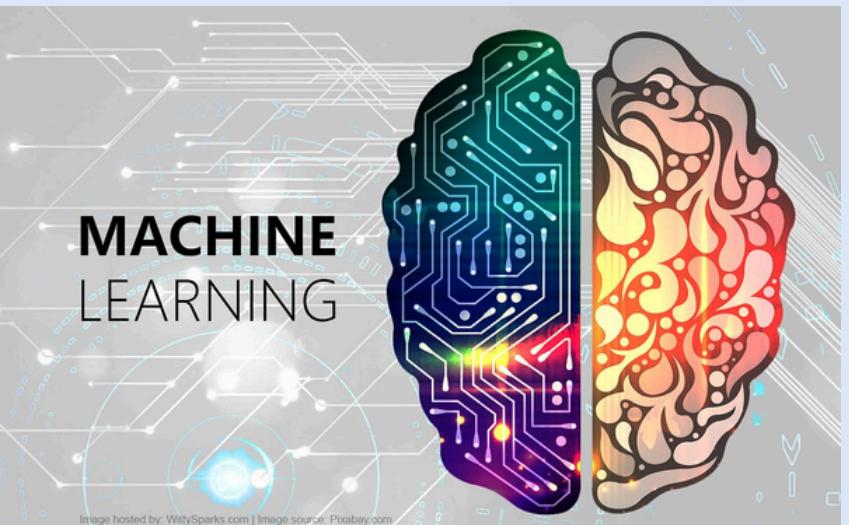
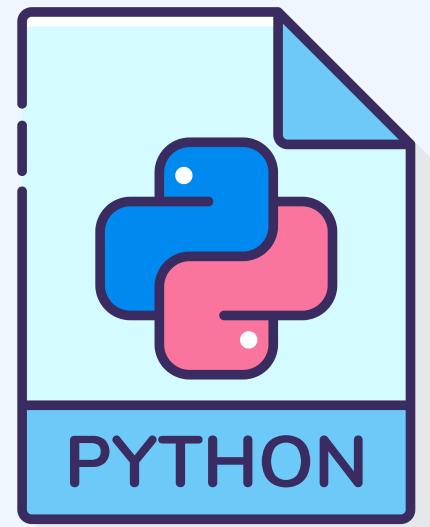
Provide insights into the factors influencing predictions to support medical decision-making.



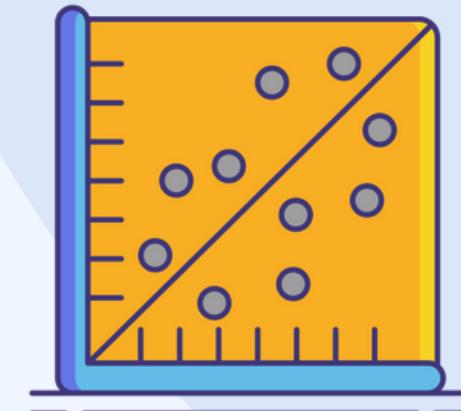
Methodology and Approach



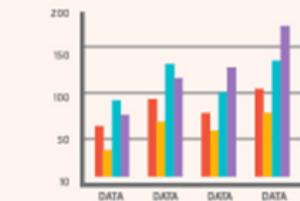
Technologies/Tools Used



Pandas



Streamlit



Diabetes Prediction



Diabetes is a chronic disease that occurs when your body can't produce enough insulin or doesn't use insulin properly. Insulin is a hormone made by your pancreas that helps glucose (sugar) from food get into your cells for energy.

Symptoms - Diabetes can often manifest with a variety of symptoms, including frequent urination, increased thirst, extreme hunger, unexplained weight loss, fatigue, blurred vision, slow-healing sores, and frequent infections.



Early Detection and Prevention

Proactive measures: Identifying individuals at risk allows for early intervention, such as lifestyle changes and preventive medications.

Reduced complications: Early detection can help prevent or delay the onset of serious diabetes-related complications like heart disease, stroke, and kidney failure.

Work Flow for Diabetes Prediction

Work Flow



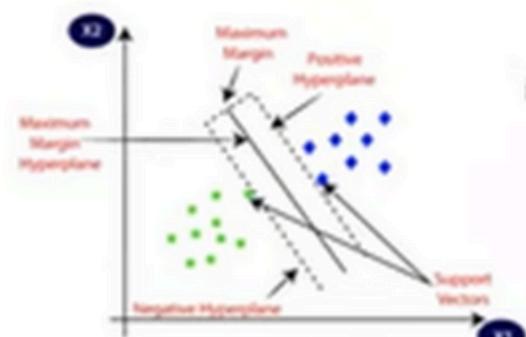
Diabetes Data



Data pre processing



Train Test split

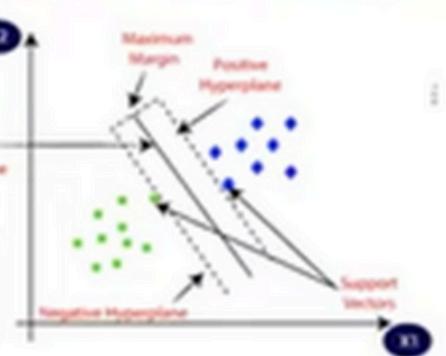


Support Vector Machine Classifier

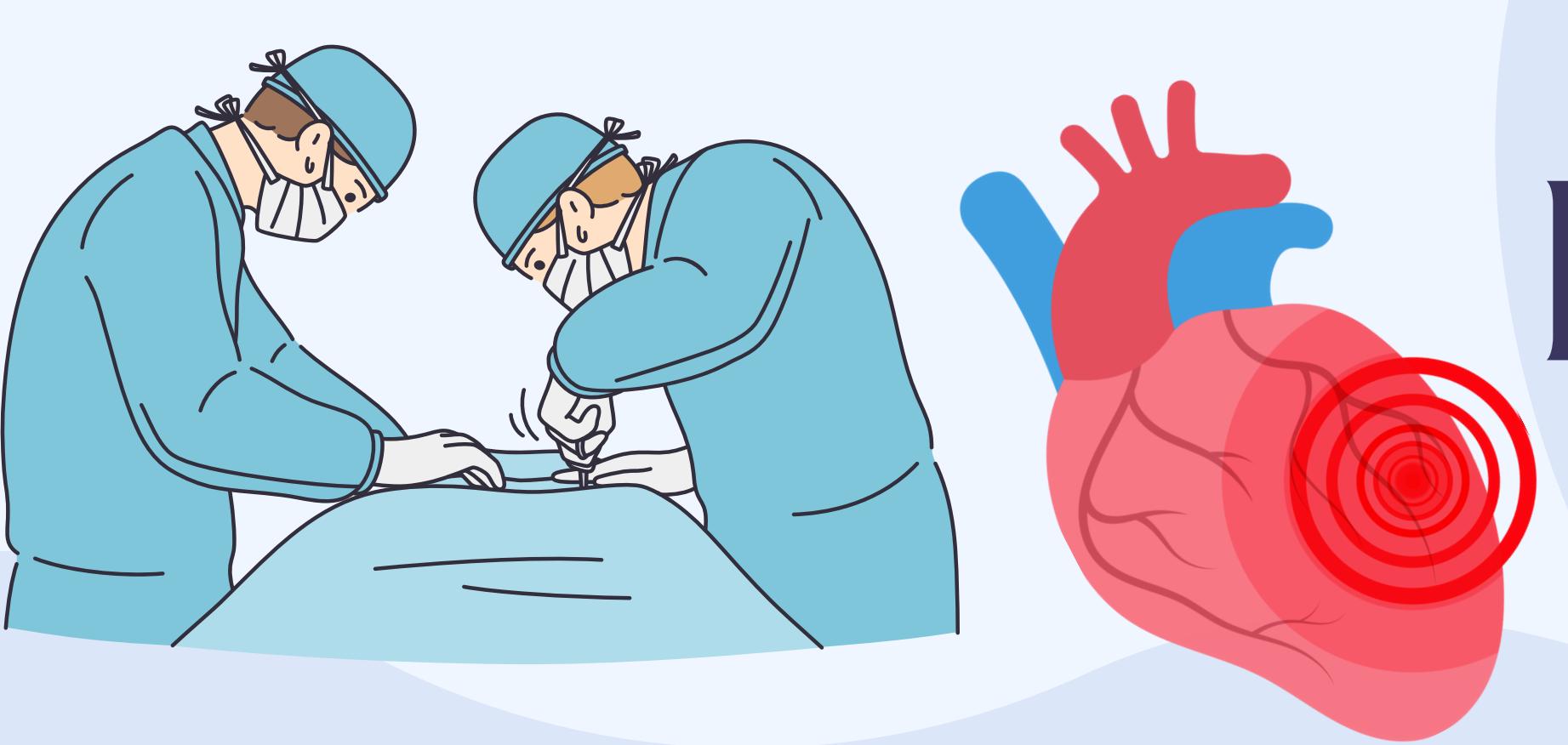


New data

Trained Support Vector Machine Classifier



Diabetic
(or)
Non-Diabetic
Prediction



Heart Disease Prediction

Heart disease is a broad term that encompasses a variety of conditions affecting the heart and blood vessels. It is a leading cause of death worldwide.

Symptoms of heart disease can vary depending on the specific condition, but some common ones include:

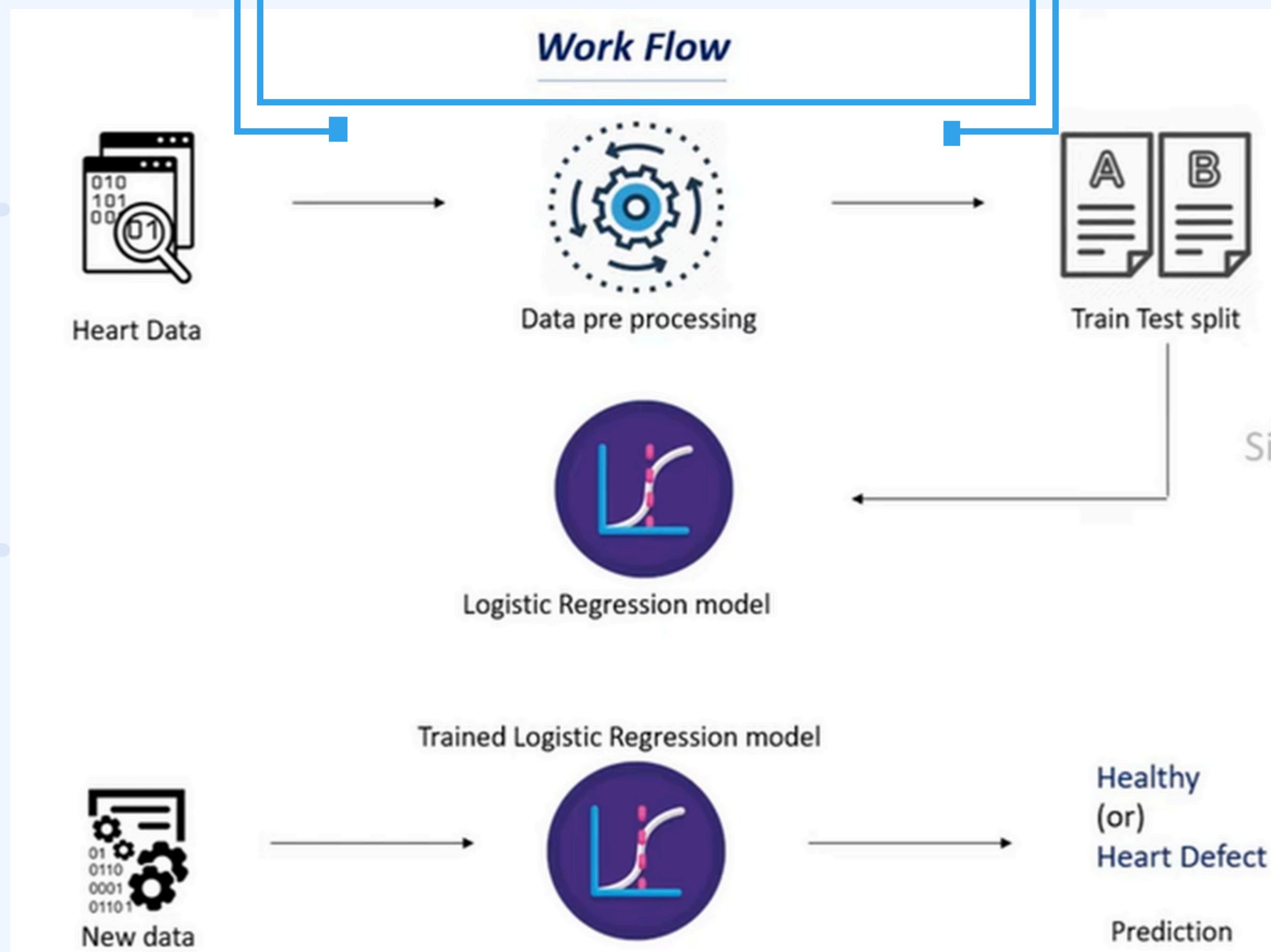
- Chest pain or discomfort, often described as a squeezing or pressure
- Shortness of breath, especially with physical activity , dizziness .
- Pain in the arm, shoulder, neck, jaw, or back ,Cold sweats or nausea

Early Detection and Prevention

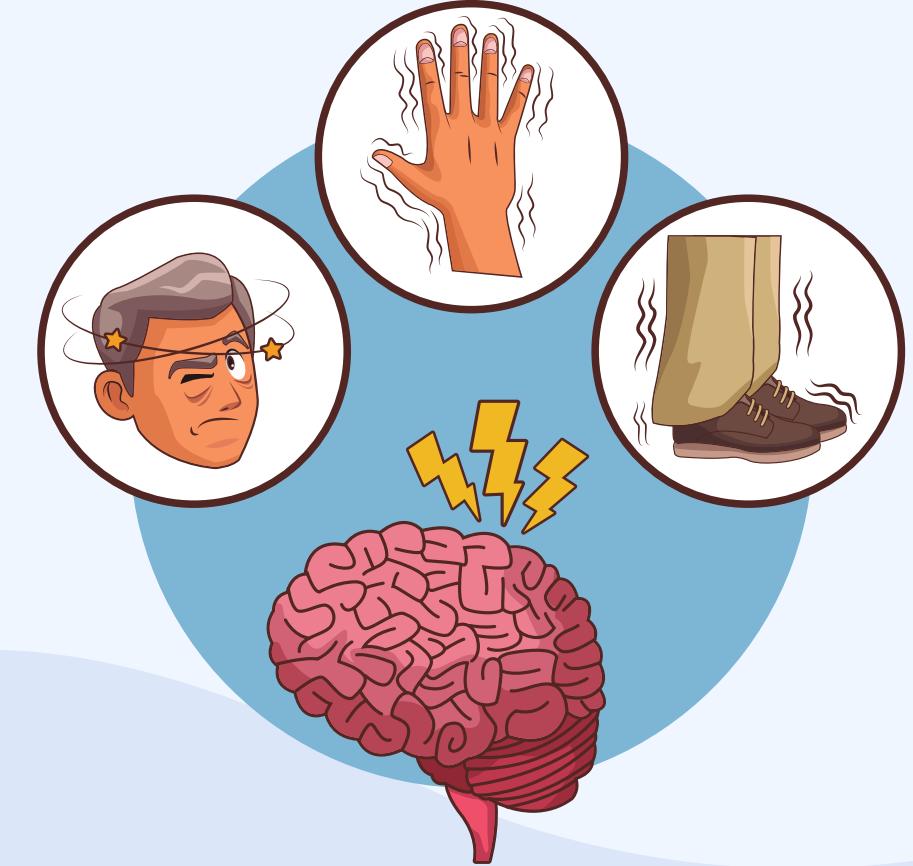
- **Proactive measures:** Identifying individuals at risk allows for early intervention, such as lifestyle changes and preventive medications.
- **Reduced complications:** Early detection can help prevent or delay the onset of serious heart disease-related complications like heart attacks and strokes.

Work Flow for Heart Disease Prediction

Work Flow



Parkinson's Disease



Parkinson's disease is a progressive neurodegenerative disorder that affects the nervous system. It is characterized by the loss of dopamine-producing nerve cells in a part of the brain called the substantia nigra. Dopamine is a chemical messenger that helps control movement.

Symptoms of Parkinson's disease may include:

- **Tremor:** Shaking or trembling of a limb, usually the hand or finger.
- **Rigidity:** Stiffness or resistance to movement in the muscles.
- **Bradykinesia:** Slowness of movement or difficulty initiating movement.

Improved Patient Outcomes

- **Early intervention:** Early diagnosis allows for prompt initiation of treatment, potentially slowing the progression of the disease and improving quality of life.
- **Reduced complications:** Early detection can help prevent or delay the onset of serious complications, such as falls, swallowing difficulties, and cognitive decline.

Work Flow for Parkinson's Prediction

Work Flow



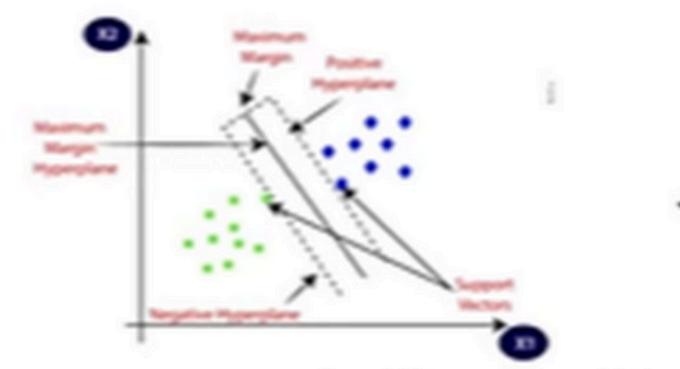
Parkinson's Data



Data pre processing

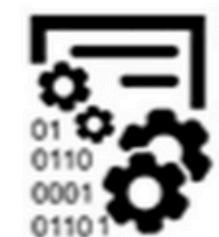


Train Test split

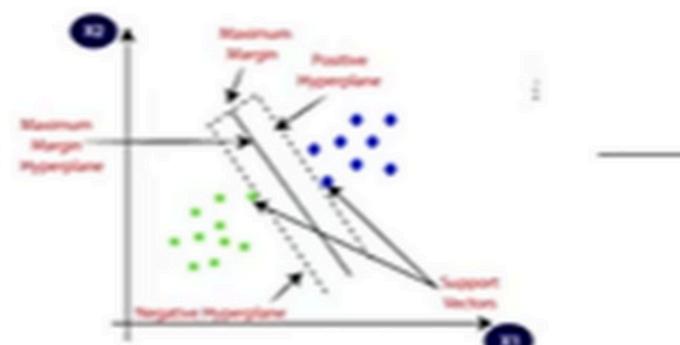


Support Vector Machine Classifier

Trained Support Vector Machine Classifier



New data

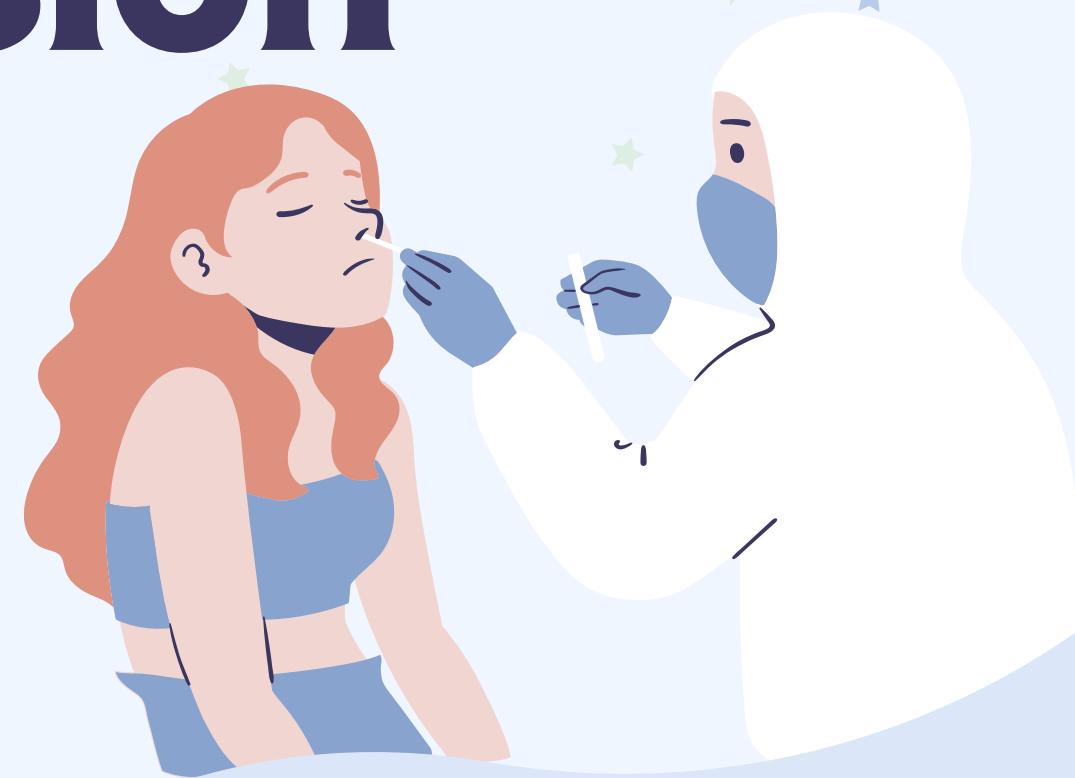


Parkinson's (or) Healthy
Prediction

Conclusion



The machine learning model developed for multiple disease prediction has shown promising results in accurately diagnosing a range of conditions based on patient data. By employing advanced algorithms and sophisticated feature engineering techniques, the model effectively overcame challenges posed by complex medical data, such as missing values, class imbalance, and varied data types. Its ability to predict multiple diseases simultaneously offers healthcare professionals valuable insights, ultimately supporting more informed decision-making and contributing to better patient outcomes.



Looking ahead, future research can explore integrating additional medical data sources, such as genetic information or real-time health monitoring, to further enhance prediction accuracy. There is also a need for developing more interpretable models that can provide deeper understanding into the factors driving predictions, ensuring transparency and trust in AI-based healthcare solutions. Additionally, ethical considerations around the deployment of AI in healthcare, such as privacy concerns and algorithmic bias, will be crucial to address as the field continues to evolve.

Thank you for your attention

