

# A Data-Driven Approach to Hospital Readmissions in Diabetic Patients

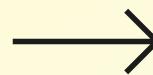
**SET PROJECT – FALL SEMESTER 2023 – 2024**

**SET ID – 222305**



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**GUIDE**  
**Dr BSRV PRASAD**



# Agenda

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**Abstract**

**Introduction**

**Motivation**

**Literature Review**

**Aim of Project**

**Methodology**

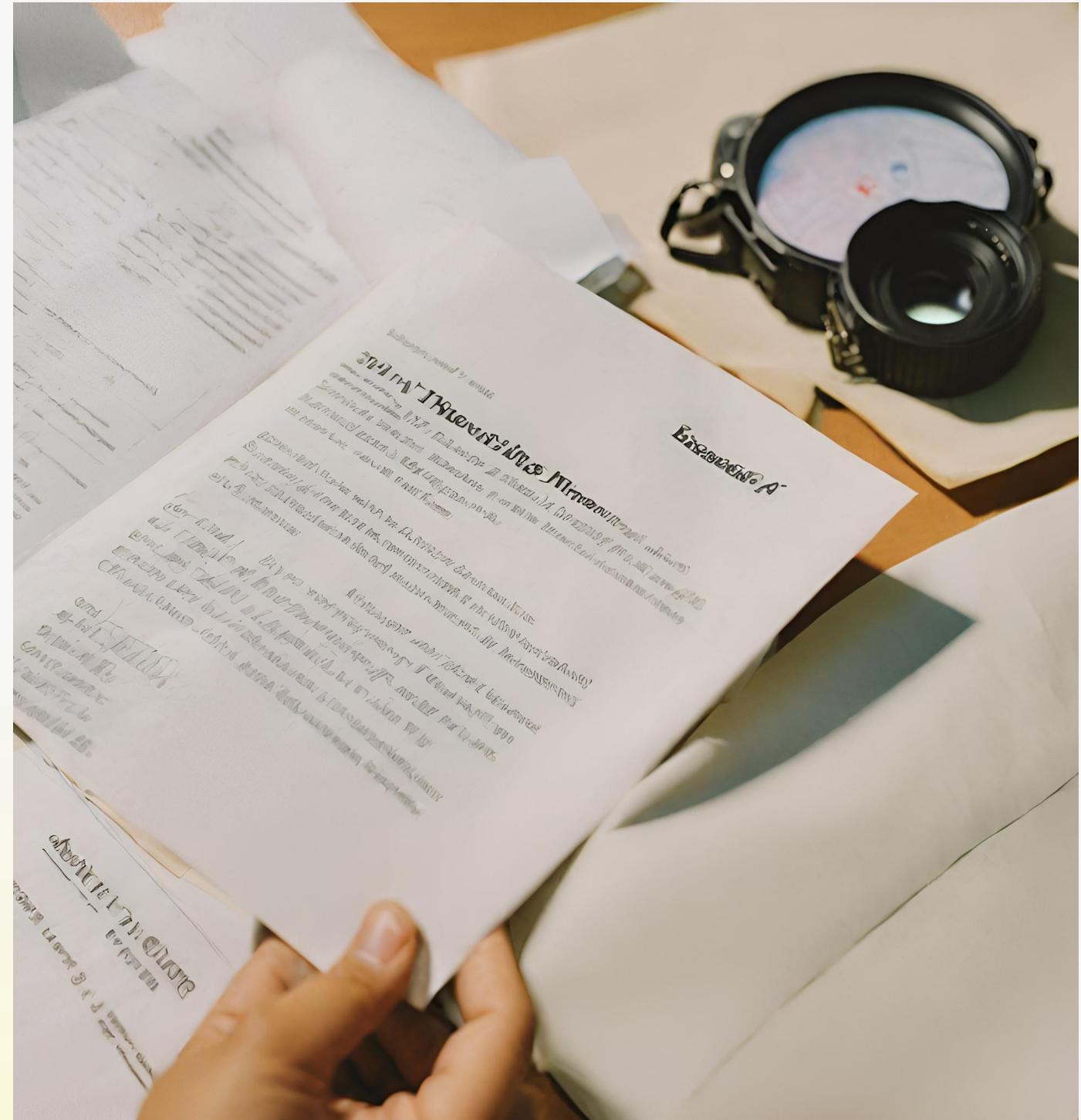
**Results**

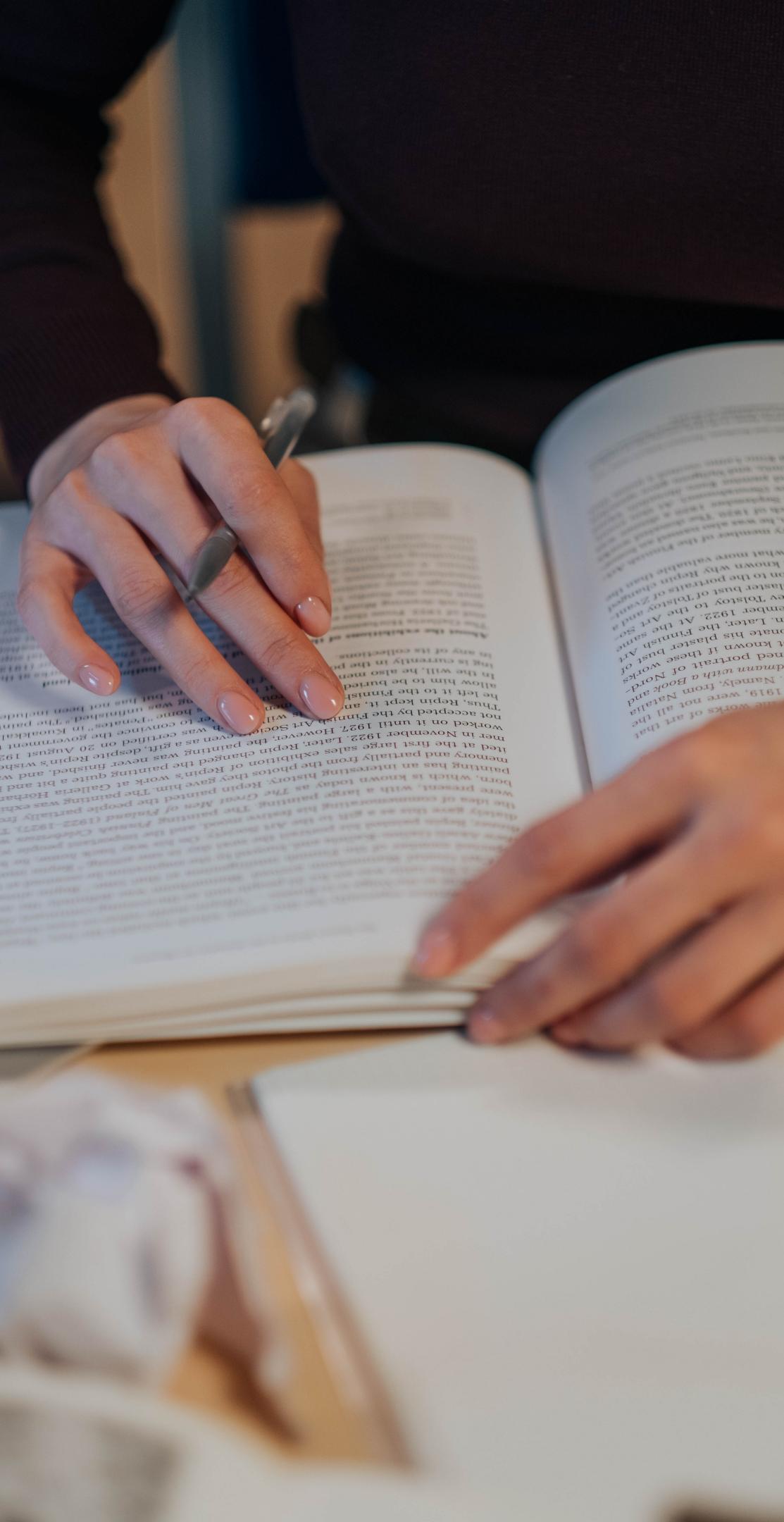
**Conclusion**

# Abstract

- Addressing a Critical Healthcare Challenge
- Innovative Predictive Model
- Comprehensive Patient Care Approach
- Impact on Healthcare Efficiency

**Keywords** - Hospital Readmission, Diabetes, Predictive Modelling, Decision-Making, Machine Learning, Classification Algorithms, Random Forests



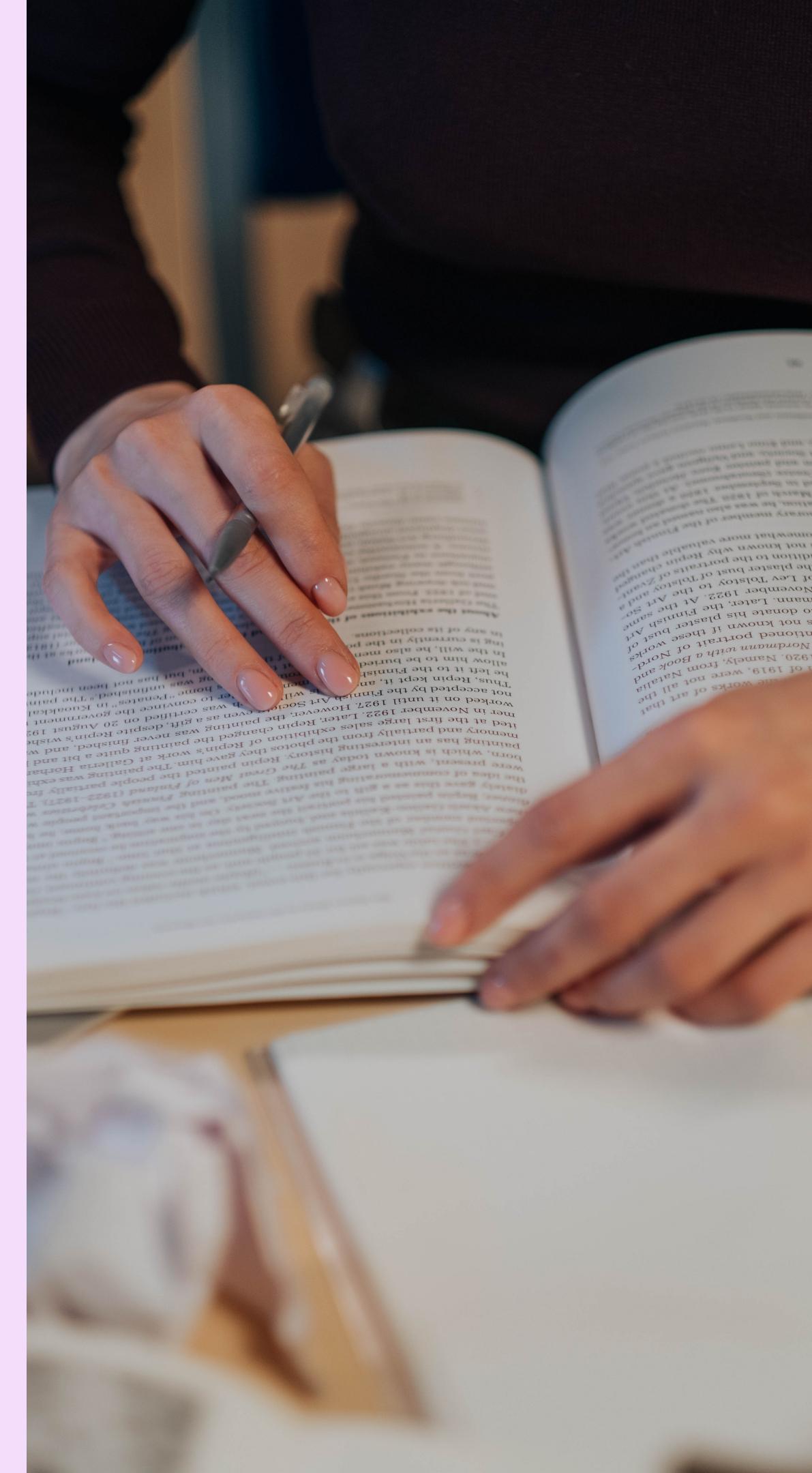


# Introduction

- **Objective:** To predict diabetes patients at risk of hospital readmission, reducing costs and patient disruption.
- **Approach:** Utilizing statistical tools such as Naive Bayes, Decision Trees, and Random Forests.
- **Significance:** Aids healthcare providers in decision-making, cuts down unnecessary readmissions, and improves patient care.

# Motivation

- High Hospital Readmission Rates
- Costs and Disruptions
- Enhancing Patient Outcomes
- Clinical Impact
- Data-Driven Approach





# Literature Review

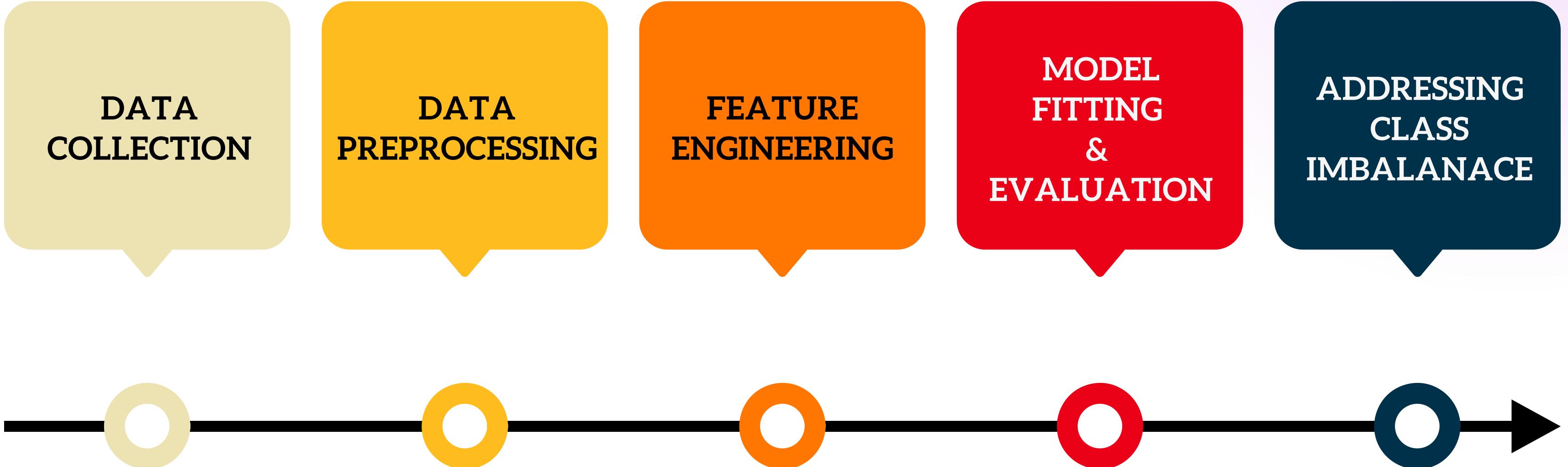
Prior studies have explored various aspects of hospital readmission prediction for diabetic patients, but the Gaps we had found were:

- Limited emphasis on the use of deep learning models in readmission prediction.
- Variability in the identification of factors associated with scheduled and unscheduled readmissions.
- The comparative performance of different Classification Algorithms.

# Aim of the Project

- Reducing Hospital Readmission
- Optimizing Healthcare Practices
- Contribution to Diabetes Care

# Methodology



# The Data Journey

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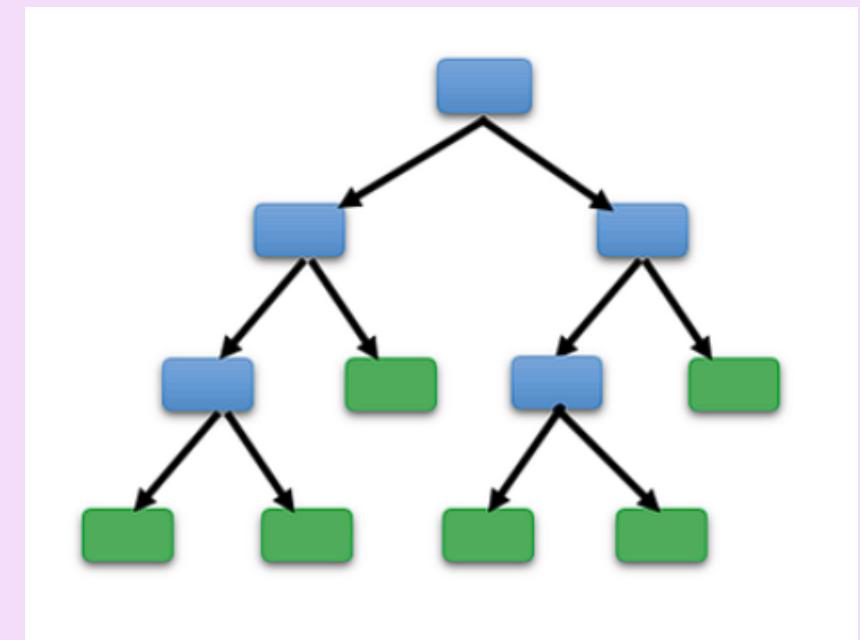
- Comprehensive Dataset Analysis
- Robust Data Handling
- Categorical Variable Encoding
- Feature Engineering



# Model Fitting & Evaluation

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- Model Selection
- Model Evaluation
- Class Imbalance Handling
- Transparent & Ethical Utilization



# Hyperparameter Tuning

- Optimizing Model Constraints
- Advanced Algorithm Application
- Confidentiality Assurance



# Conclusion

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## Innovative Predictive Model

The project introduces a sophisticated predictive model that effectively bridges data-driven insights and clinical practice, providing a forward-thinking solution to the persistent issue of hospital readmissions for diabetic patients.

## Clinically Ethical

The model's transparency and adherence to ethical considerations highlight its responsible deployment in healthcare, ensuring a positive impact on patient care without compromising ethical standards.

## Future Implications

This research marks a substantial advancement in reducing readmissions, enhancing patient outcomes, and optimizing healthcare strategies for diabetes management. Future investigations and practical applications are essential to realizing the full potential of this technology in improving healthcare quality.

# **Thank you!**

**Do you have any questions?**