

# EMPLOYEE ATTRITION PREDICTION



# OVERVIEW

Designing a predictive model to identify employees at risk of leaving the organization



# INTRODUCTION

Losing valuable employees is costly for organizations.

- High costs of recruiting, training, and onboarding.
- Impact on productivity and morale.

## USING MACHINE LEARNING, WE AIM TO

- Predict employee attrition.
- Help HR teams take proactive measures to retain employees.



# PROBLEM STATEMENT

- **Challenge** Traditional methods rely on intuition, not data
- **Solution:** Predict employee attrition using data-driven insights.



# GOALS

## **Predict Employee Attrition**

Build a model to predict employees at risk of leaving.

## **Inform Data-Driven Decision Making**

Provide insights to HR teams for effective retention strategies.

## **Enhance Organizational Performance**

Improve employee satisfaction and reduce turnover.

## **Optimize Resource Allocation**

Improve employee satisfaction and reduce turnover.

## **Key Attrition Drivers Identification**

Pinpoint the root causes of attrition (e.g., job dissatisfaction, recognition issues).



# RELATED WORK

[HTTPS://WWW.RESEARCHGATE.NET/PUBLICATION/326029536\\_EMPLOYEE\\_ATTRITION\\_PREDICTION](https://www.researchgate.net/publication/326029536_EMPLOYEE_ATTRITION_PREDICTION)

[HTTPS://WWW.RESEARCHGATE.NET/PUBLICATION/354703174\\_UNDERSTANDING\\_EMPLOYEE\\_ATTRITION\\_USING\\_MACHINE\\_LEARNING\\_TECHNIQUES](https://www.researchgate.net/publication/354703174_UNDERSTANDING_EMPLOYEE_ATTRITION_USING_MACHINE_LEARNING_TECHNIQUES)

[HTTPS://WWW.RESEARCHGATE.NET/PUBLICATION/308043155\\_PREDICTION\\_OF\\_EMPLOYEE\\_TURNOVER\\_IN\\_ORGANIZATIONS\\_USING\\_MACHINE\\_LEARNING\\_ALGORITHMS](https://www.researchgate.net/publication/308043155_PREDICTION_OF_EMPLOYEE_TURNOVER_IN_ORGANIZATIONS_USING_MACHINE_LEARNING_ALGORITHMS)

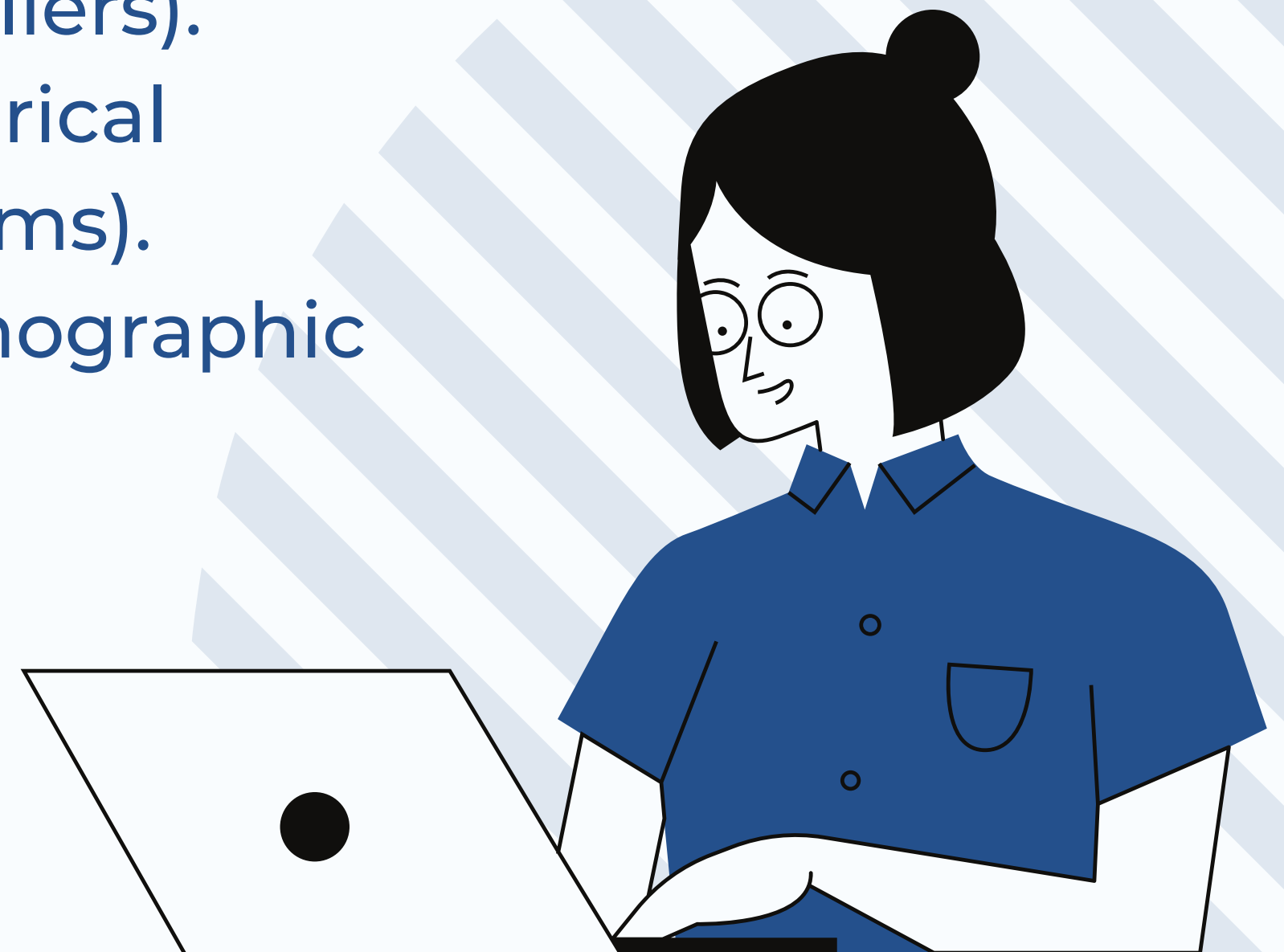
[HTTPS://WWW.MDPI.COM/2076-3417/12/13/6424](https://www.mdpi.com/2076-3417/12/13/6424)

[HTTPS://WWW.SCIENCEDIRECT.COM/SCIENCE/ARTICLE/ABS/PII/S095741742202382X](https://www.sciencedirect.com/science/article/abs/pii/S095741742202382X)



# PROPOSED METHODOLOGY

- Overview of the machine learning workflow:
  - Data preprocessing and cleaning (handling missing values and outliers).
  - Visualizing categorical and numerical features (e.g., pie charts, histograms).
  - Analyzing attrition trends by demographic and job-related factors.
  - Predictive insights.



# RESULTS

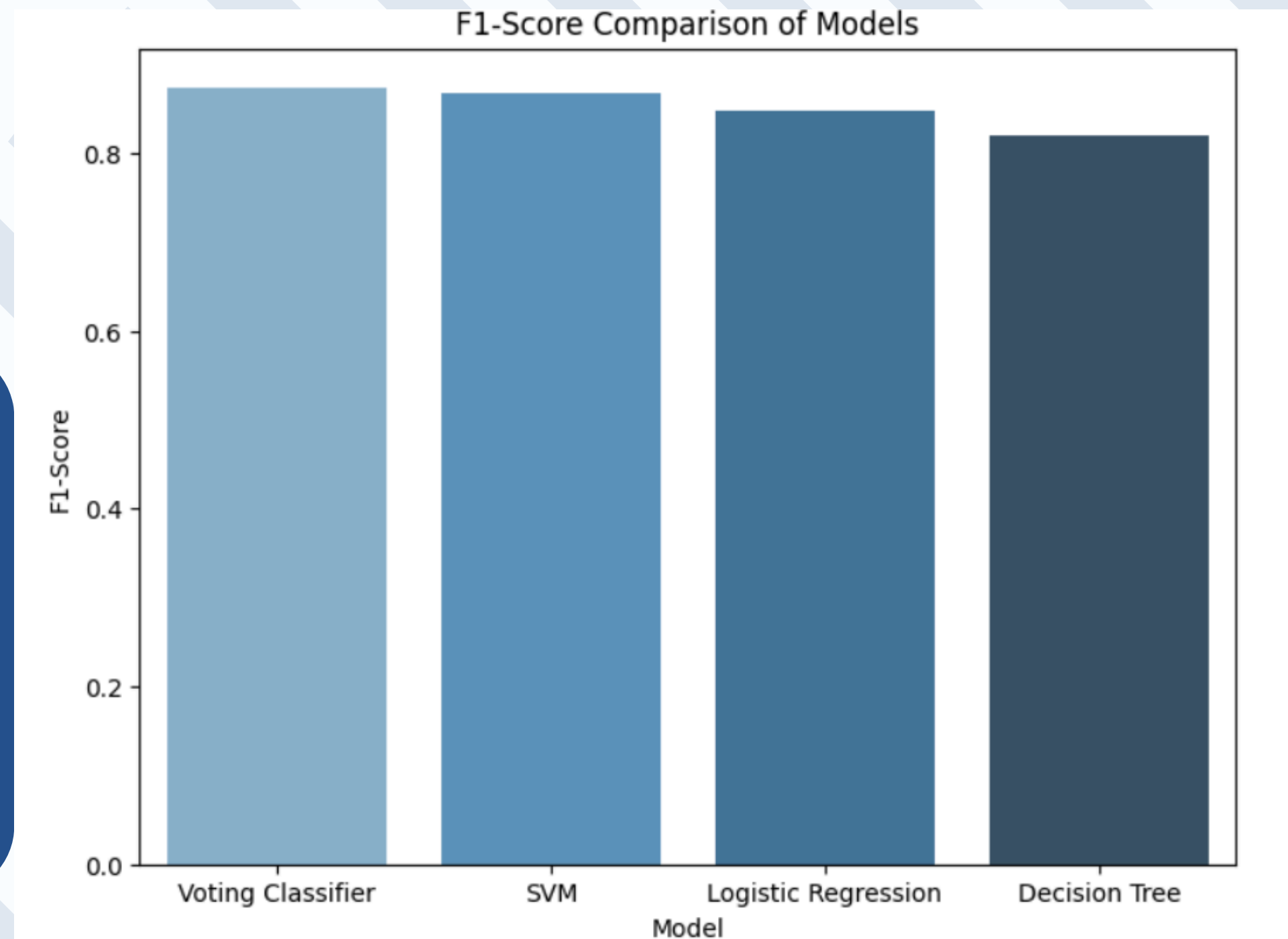
Logistic regression model **0.84**

Decesion Tree **0.81**

SVM **0.86**

voting classifier **0.87**

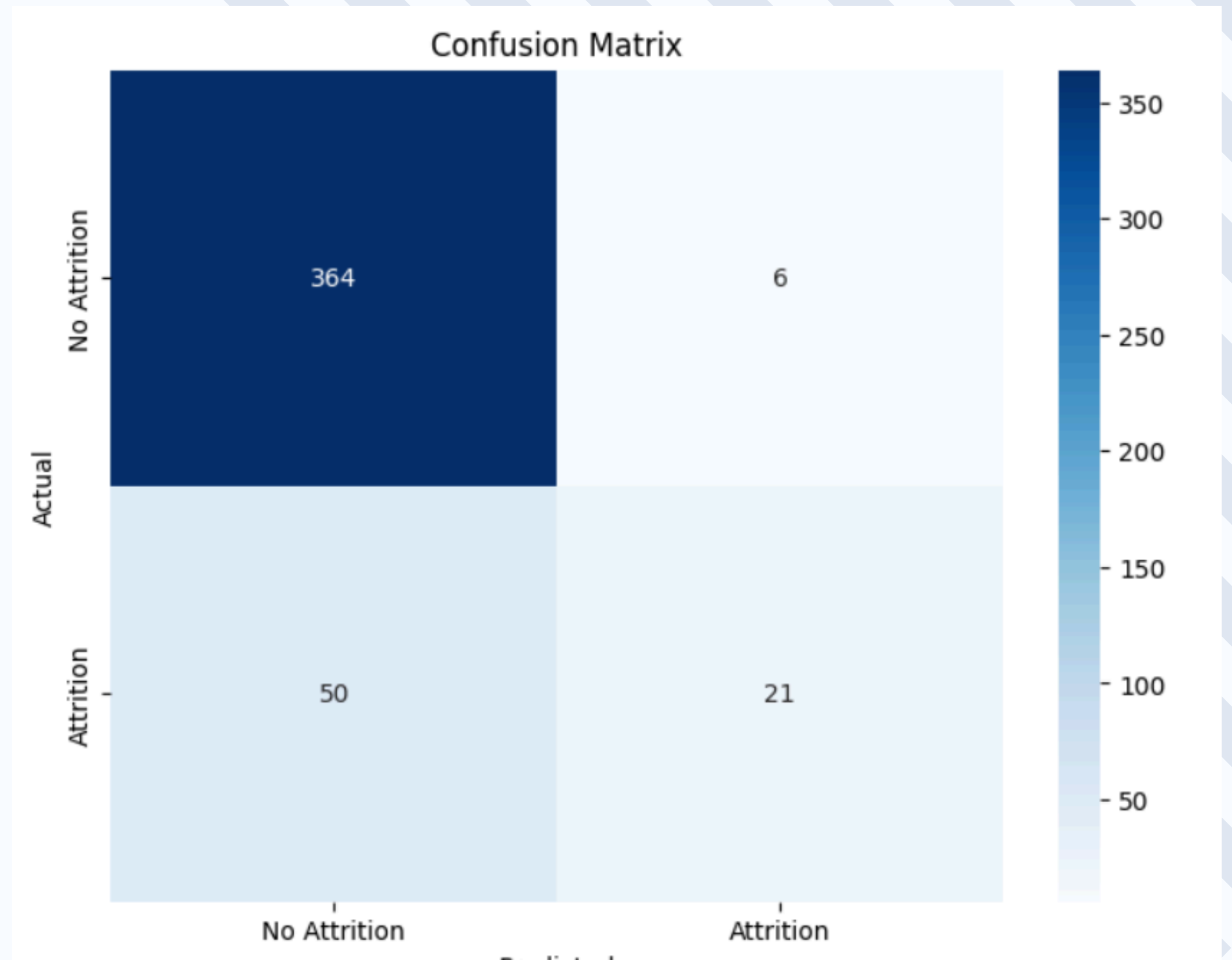
The target variable values are imbalanced so instead of using accuracy metric  
We will be using the **f1\_score**





# CONCLUSION

voting classifier demonstrated  
strong predictive accuracy  
(87%)



# MEET THE TEAM

This project was a collaborative effort by our talented team.

**shrouq osama**

**shahd tarek**

**merna elsayed**

**mawada alsayed**



# THANK YOU

