



Diabetes Prediction Project

Predicting diabetes risk using patient data to support early detection and prevent complications.

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Problem Statement



Global Health Crisis

Diabetes requires early detection
to prevent complications



Resource Efficiency

False positives waste clinical
resources



Precision Focus

Need lean, deployable tool for
accurate prediction

Agile Methodology



Sprint 1

EDA and preprocessing

Sprint 2

Feature engineering and initial model

Sprint 3

Tuning, evaluation, visualization

Sprint 4

App development and UI upgrades



Data Source

1

Pima Indians Dataset



 www.kaggle.com

Pima Indians Diabetes Databa...

Predict the onset of diabetes based on diagnostic measures



768 female patients, 9 columns

2

Key Features

Glucose, BMI, Age, etc.

3

Authenticity

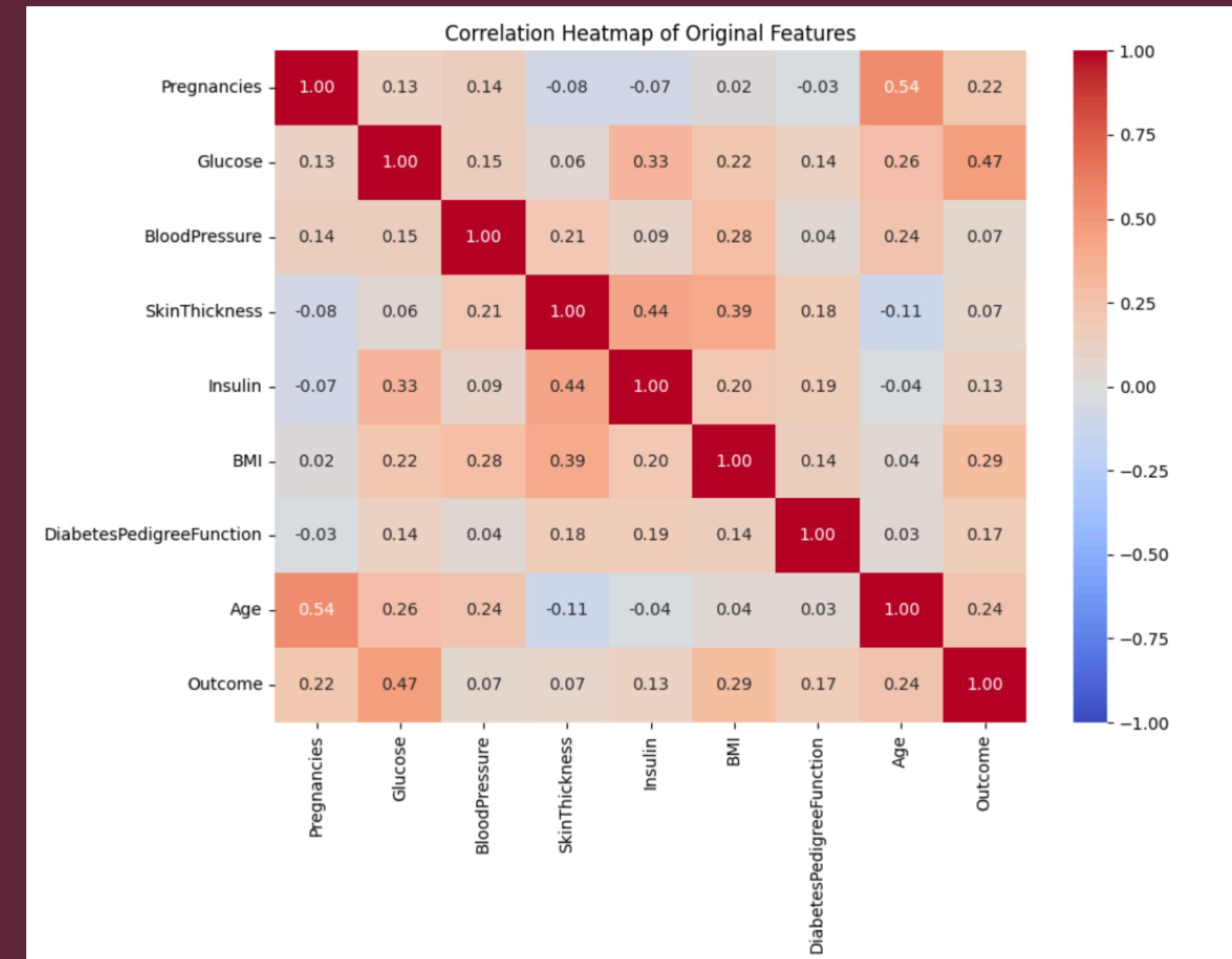
Real clinical data with limitations

EDA

Statistical Analysis

Observation: Zeros found in Glucose, Insulin fields

Insights: Strong correlation between Glucose, BMI and diabetes



Feature Engineering & Model

Add Features

Glucose_BMI, Age_Group

Drop Redundant

Removed correlated variables

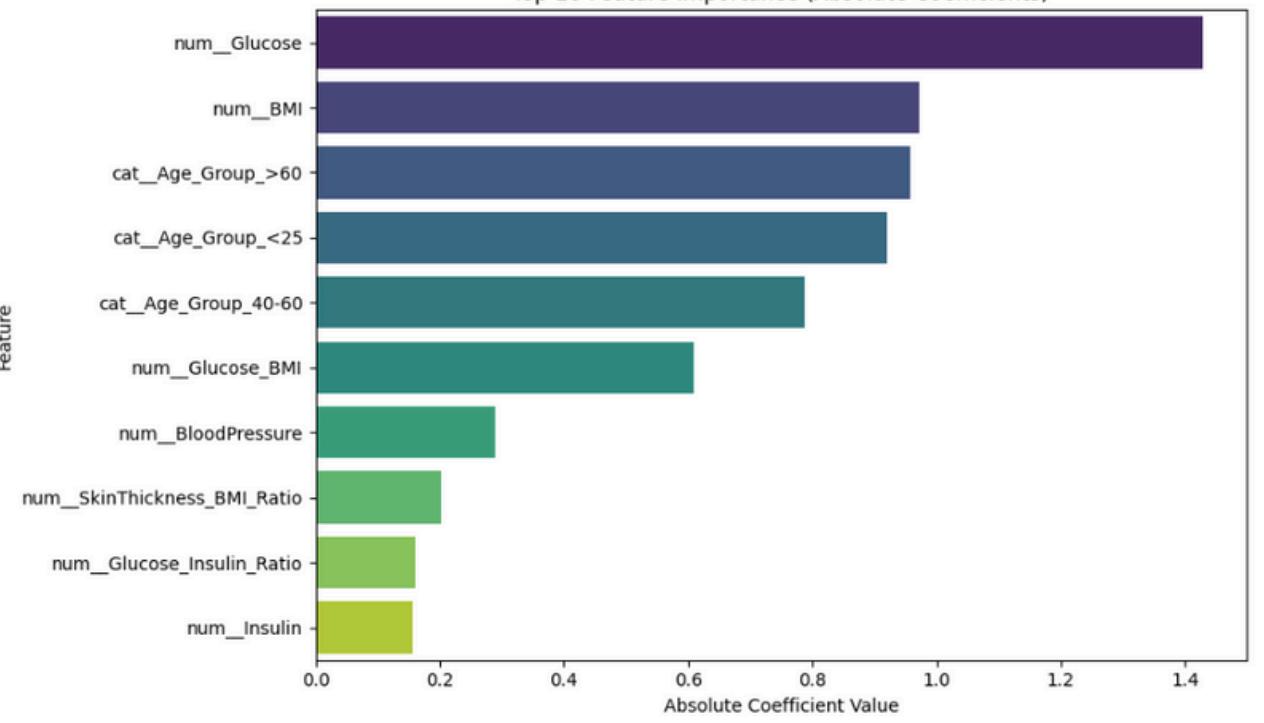
Train Model

Logistic Regression with StandardScaler

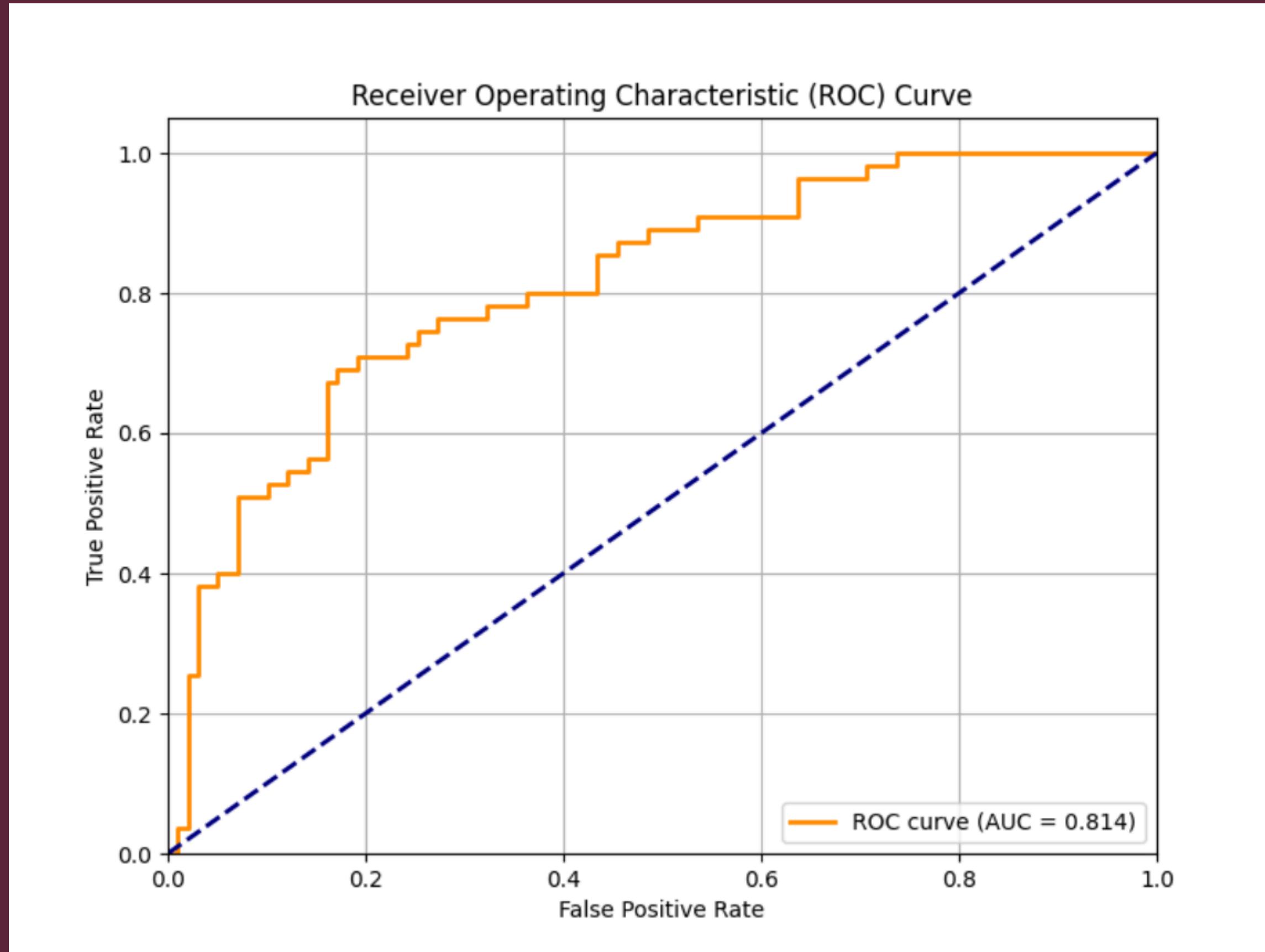
Balance Data

SMOTE for minority class

Top 10 Feature Importance (Absolute Coefficients)



Fine Tuning

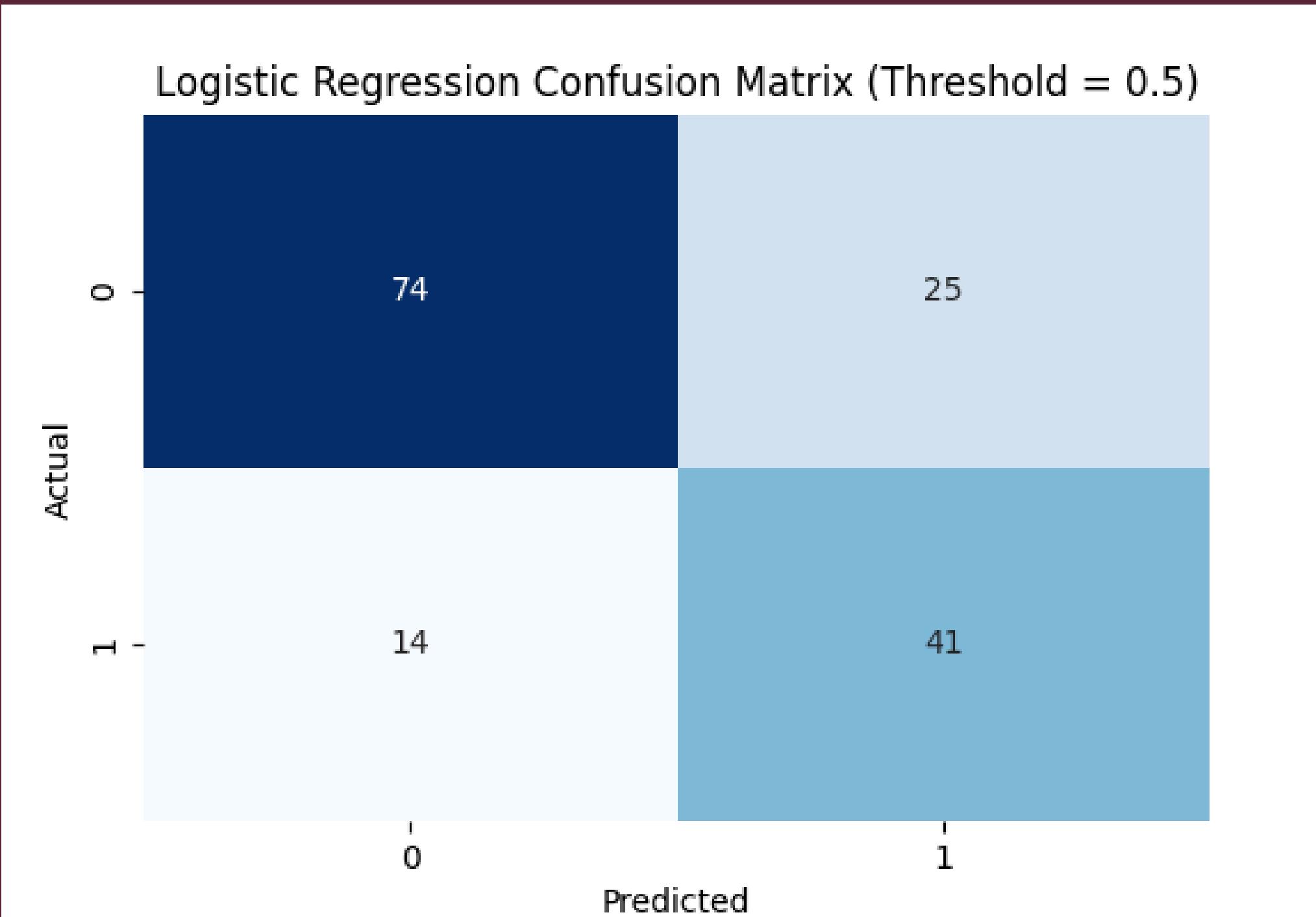


- Tuned C with GridSearchCV (0.001–100)."
- Best: C=1, CV AUC 0.8561.
- Focus: Precision for fewer false positives.

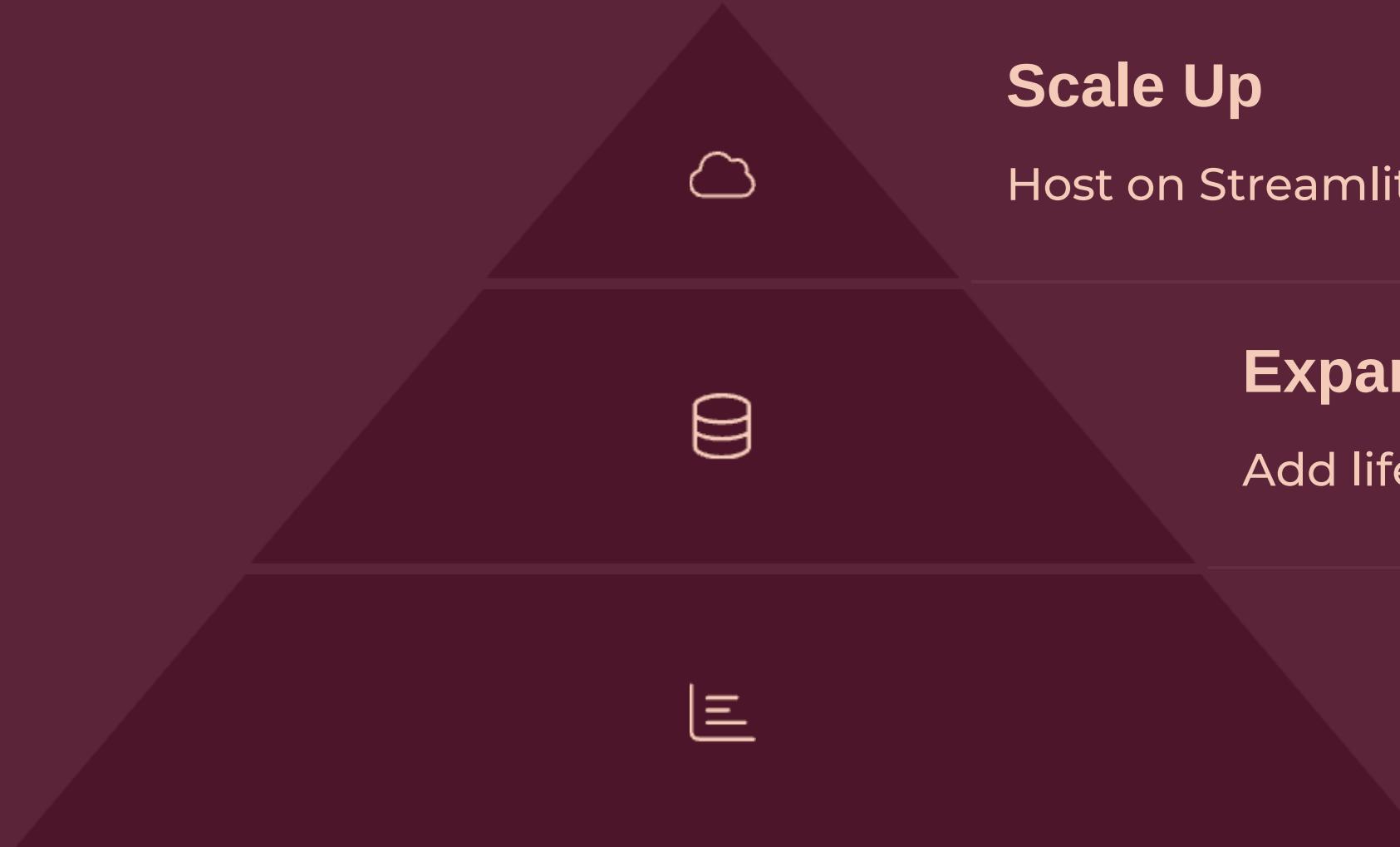
Model Performance

Confusion Matrix Highlights:

- True Positives: 41 (74.55% recall)
- False Positives: 25 (precision 0.6212)
- Fewer false positives vs. recall-heavy model.



Recommendations



Scale Up

Host on Streamlit Cloud

Expand Data

Add lifestyle factors

Test Models

Try XGBoost for higher AUC

Conclusions

- Delivered precise model (Precision 0.6212) & app.
- Impact: Cuts false positives, demo-ready.
- Future: Base for more diseases.



Questions and Answers

Thank You