## Model Accuracy Report + Confusion Matrix

## **Summary Table.**

Model	Train Accuracy	Test Accuracy	Recall (Yes)	F1 (Yes)	Overfitting?
Logistic Regression (SMOTE)	91.5%	85.7%	0.40	0.47	No
XGBoost (SMOTE)	100%	86.0%	0.30	0.41	Mild
Random Forest (SMOTE)	100%	83.3%	0.28	0.35	Mild
Decision Tree (SMOTE)	100%	73.8%	0.45	0.35	Yes

## **Updated Confusion Matrix: Logistic Regression (After SMOTE).**

	Predicted: No	Predicted: Yes	
Actual: No	233	14	
Actual: Yes	28	19	

Precision (Yes): 0.58

Recall (Yes): 0.40

F1-Score (Yes): **0.47** 

Accuracy: 85.7%

This shows a **balanced trade-off** between false positives and false negatives.



## Updated Summary Paragraph.

After testing four models on imbalanced and SMOTE-balanced data, Logistic Regression with SMOTE delivered the best balance of performance and generalization. It achieved 85.7% test accuracy and F1score of 0.47 for predicting attrition. While XGBoost achieved slightly higher accuracy (86.0%), it overfit the training data (100% training accuracy) and had lower recall. Decision Tree and Random Forest also showed signs of overfitting. Logistic Regression was chosen as the final model based on overall balance and explainability.