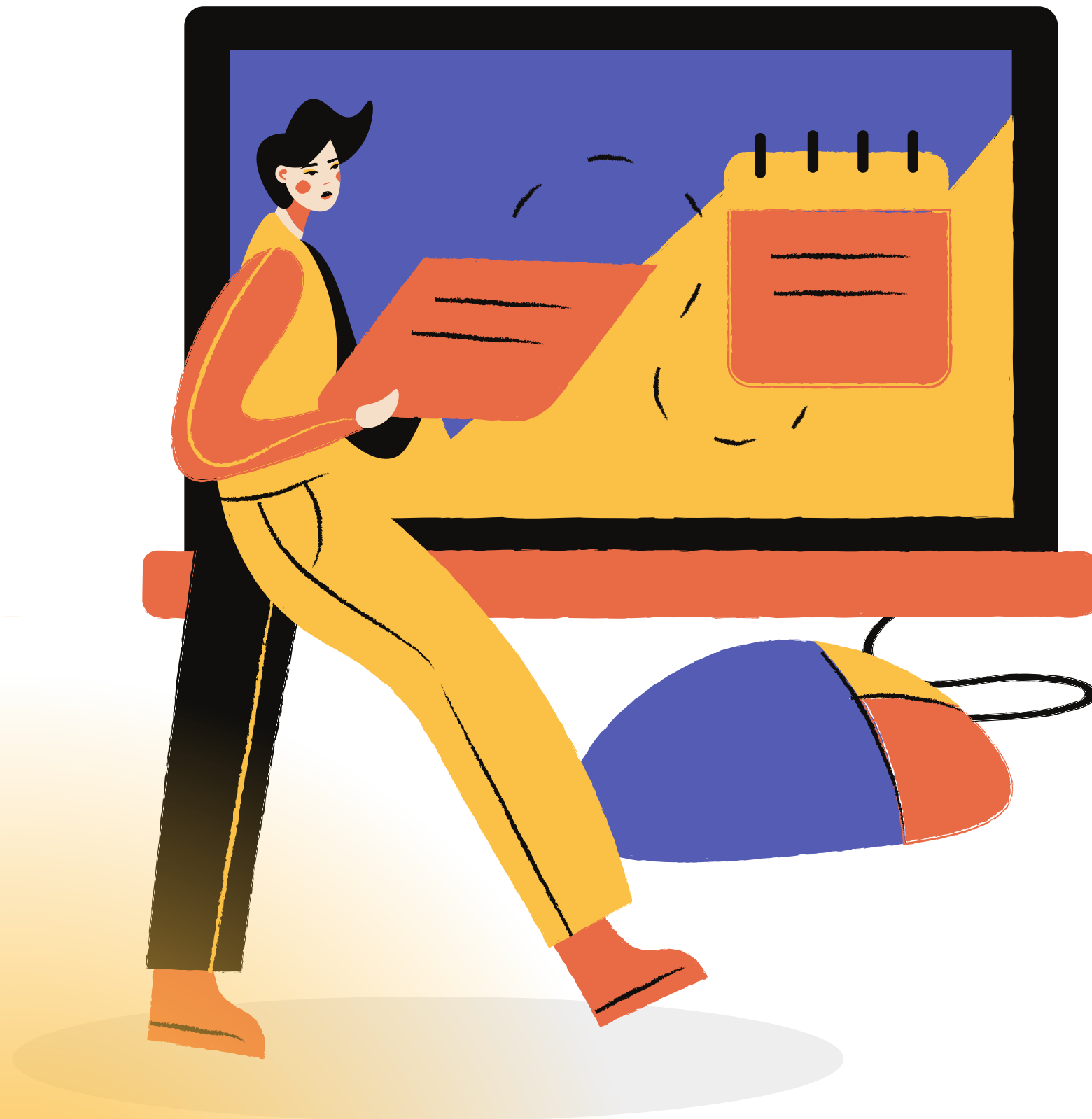


EMPLOYEE ATTRITION PREDICTION

Leveraging Logistic Regression for
Employee Attrition Prediction





Goals & Objective

Develop a predictive model to identify employee attrition accurately, minimizing false positives and maximizing precision. Balance precision and recall to ensure effective identification of potential attrition cases. Evaluate model performance using the **F1-score** to achieve a balanced predictive outcome.





Best Performing Classifier

Among all the tested classifiers, **Logistic Regression** demonstrated the best performance in predicting Attrition:

- 🏆 Accuracy = 90.89%
- 🏆 F1-score (Class 1) = 90.57%
- 🏆 Precision (Class 1) = 93.91%
- 🏆 Recall (Class 1) = 87.45%
- 🏆 AUC (Class 1) = 96.12%

F1-score for class '1'

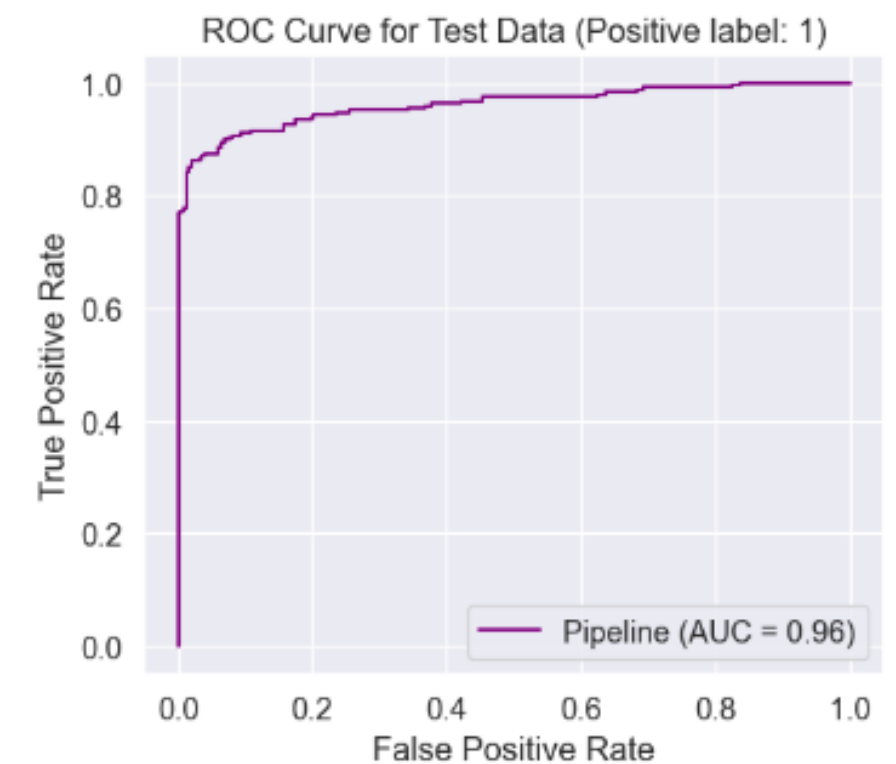
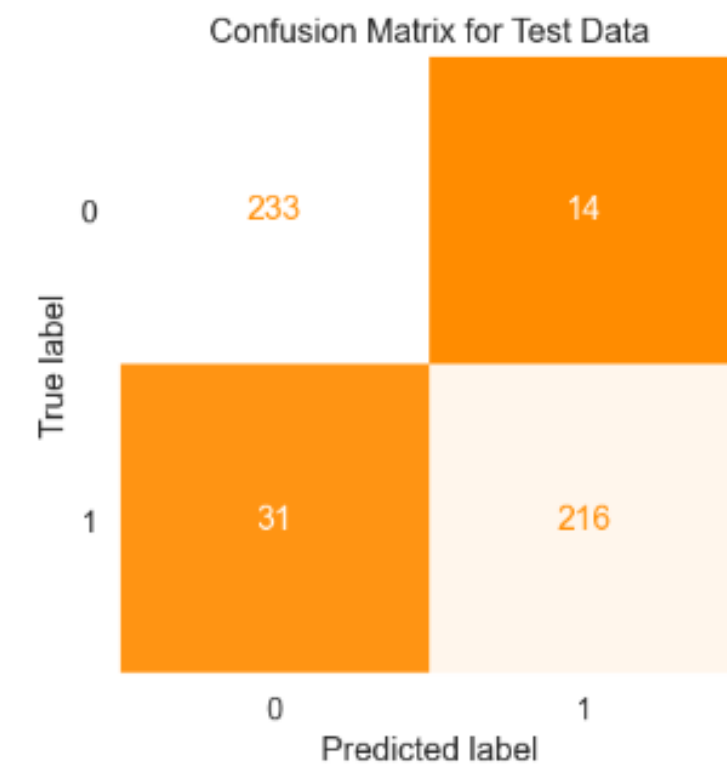


Logistic Regression Model Evaluation Insights

The model achieves an **Accuracy** of 90.89%, with **Precision** for class 1 at 93.91% and **Recall** at 87.45%. The **F1-score** for class 1 stands at 90.57%, while the **AUC** is 96%, showcasing strong discriminative power. Though some False Positives and Negatives exist, the model effectively minimizes them. Furthermore, it shows good generalization to unseen data, indicating no overfitting.

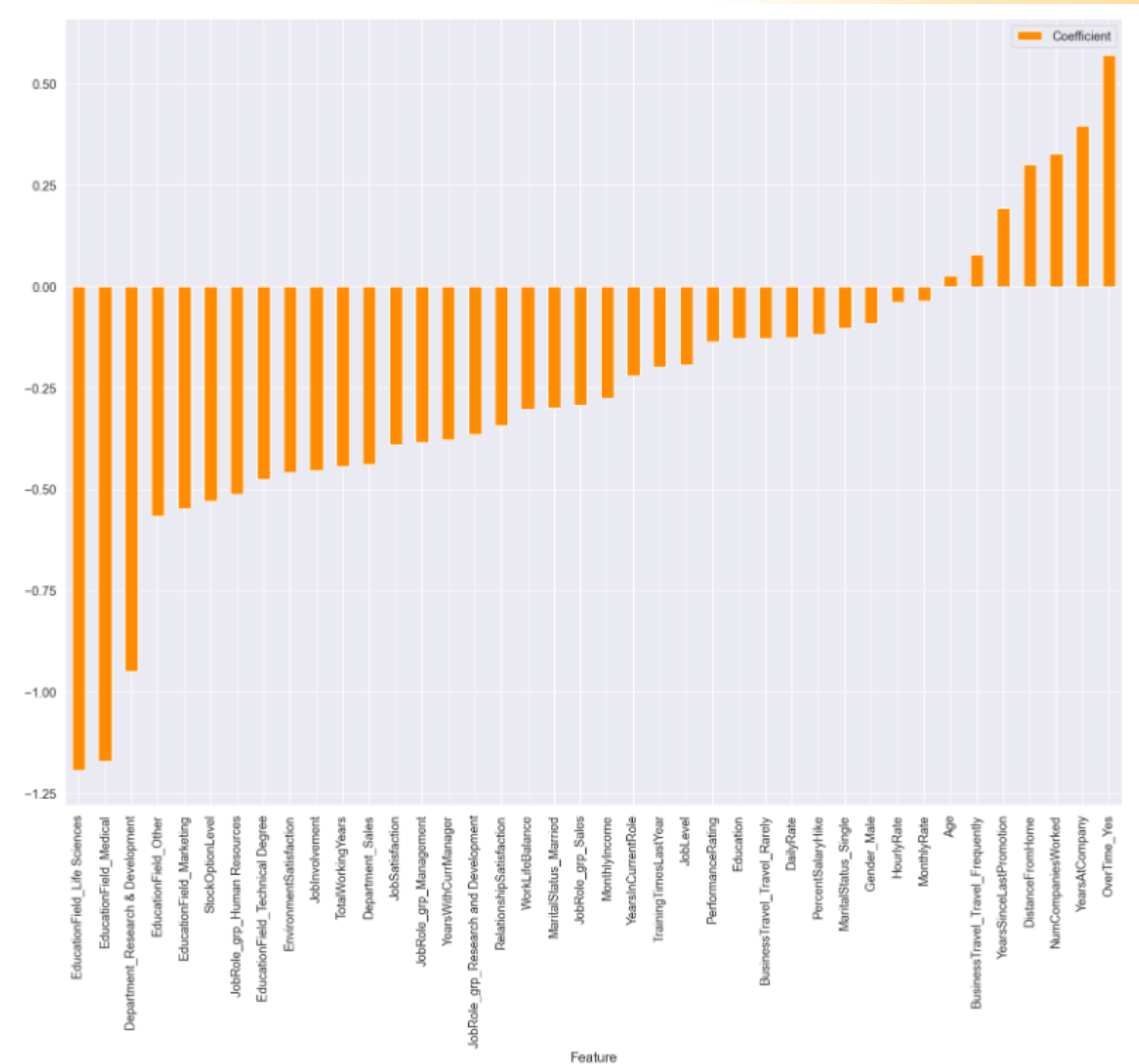
Classification report for training set				
	precision	recall	f1-score	support
0	0.89	0.94	0.91	986
1	0.94	0.88	0.91	986
accuracy			0.91	1972
macro avg	0.91	0.91	0.91	1972
weighted avg	0.91	0.91	0.91	1972

Classification report for test set				
	precision	recall	f1-score	support
0	0.88	0.94	0.91	247
1	0.94	0.87	0.91	247
accuracy			0.91	494
macro avg	0.91	0.91	0.91	494
weighted avg	0.91	0.91	0.91	494



Feature Importance Insights

- **OverTime_Yes:** Working overtime increases attrition.
- **YearsAtCompany:** Longer tenure doesn't ensure retention.
- **NumCompaniesWorked:** Multiple past jobs suggest a propensity to leave.
- **DistanceFromHome:** Farther commutes correlate with higher attrition.
- **YearsSinceLastPromotion:** Lack of recent promotions indicates dissatisfaction.
- These factors with positive coefficients imply higher attrition likelihood.





Conclusion



1. Logistic Regression excels in predicting Attrition, offering reliable insights.
2. Key Factors: Overtime work, tenure, job history, commute distance, and promotion intervals significantly impact attrition.
3. Action Plan:
 - Tailored Retention: Target interventions addressing work-life balance, career advancement, and employee satisfaction.
 - Support Programs: Implement initiatives aiding long-tenured employees and addressing commute challenges.





Thank You