Analysis Review & Insights - HR Employee Attrition

Analysis Review & Insights

This project delivers a well-rounded exploratory and predictive analysis of HR employee attrition. Below is a structured review based on the outcomes and visualizations:

Strengths of the Analysis

- Comprehensive EDA

  The analysis covers key dimensions such as Department, Income Band, and Age Group, offering a clear view of where attrition is most prevalent.

- Effective Visualizations

  Seaborn countplots and Matplotlib pie charts provide visual clarity. The income band segmentation using qcut is particularly useful for comparing attrition across salary ranges.

- Machine Learning Integration

  A Logistic Regression model has been applied to predict attrition, and its effectiveness is measured using an ROC curve and AUC score.

- Clean Data Handling

  Null value checks and logical feature creation (e.g., income bands) ensure a clean and structured dataset.

Key Business Insights

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- Certain departments show higher attrition rates, indicating a need for deeper HR review in those areas.
- Lower income bands tend to leave more frequently, suggesting compensation might be a factor.
- Specific age groups show a trend of higher attrition, likely due to career transition periods.

Areas for Improvement

- Feature Engineering: Include more features like job satisfaction, years at company, overtime, etc.
- Model Comparison: Try other models like Decision Trees, Random Forest, or XGBoost.
- Preprocessing Details: Mention handling of categorical variables such as one-hot encoding.
- Classification Report: Add metrics like precision, recall, and F1-score to improve interpretability.

Overall Verdict

This project provides strong, data-driven HR insights and successfully integrates data visualization with machine learning to predict employee attrition.