

Employee Attrition Prediction Project

Project Overview

This project focuses on predicting employee attrition using a Random Forest Classifier trained on the IBM HR Analytics dataset. It incorporates both Python for machine learning and Power BI for visual storytelling.

Machine Learning Model (Python)

- Cleaned and preprocessed HR data, including encoding categorical variables
- Used Random Forest Classifier with class weights to handle imbalanced target
- Applied GridSearchCV to optimize hyperparameters (depth, splits, estimators)
- Achieved improved performance using cross-validation and F1-score optimization
- Generated a feature importance chart to identify key attrition drivers

Power BI Visuals

- Created matrix heatmaps and bar charts to visualize attrition by department, role, and satisfaction
- Designed KPI cards for overall attrition rate, income, and average tenure
- Enabled filters and slicers for department, gender, overtime, and job role
- Supported data storytelling by aligning visual and model insights

Included Files

- Python Script: attrition_model_tuned.py
- Feature Importance Plot: attrition_gridsearch_feature_importances.png
- Power BI Dashboard: Attrition_Insights.pbix