Employee Attrition Prediction Dashboard

Introduction

This repository provides a fully interactive Streamlit dashboard for predicting employee attrition risk using machine learning (Random Forest). Users can upload their HR dataset and visualize high-risk employees, potential reasons for leaving, and perform what-if analysis to simulate retention strategies.

Business Importance

Business Importance of This Dashboard:

- Reduce Employee Turnover: Proactively identify employees who are most likely to leave and take preventive action before it's too late.
- Save Recruitment Costs: Hiring and onboarding new employees is expensive. This dashboard enables HR to save significant costs by improving retention.
- Boost Employee Satisfaction: Identify root causes like low satisfaction or lack of training and address them with targeted interventions.
- Empower HR Decision-Making: With analytics and predictive models, HR teams can move from reactive to data-driven strategies.
- What-If Scenario Planning: Simulate policy changes (e.g., increased salary or training) to see how they affect attrition risk.
- Investor Confidence: Businesses with lower churn and stronger retention strategies attract better valuations and trust.

Key Features

Key Features:

- Upload employee CSV file with required columns (EmployeeNumber, Attrition, JobRole, Department)
- Predict attrition probability using RandomForest
- Highlight high-risk employees with reasons (e.g. Overtime, Low Job Satisfaction)

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- Filter by department, job role, risk level, and attrition probability
- Scenario analysis (What-If impact of salary, training, satisfaction)
- Dashboard with charts: risk distribution, key factors, pie & treemaps
- Generate Excel report of filtered data

Technology Stack

Technology Stack:

- Python 3.10+
- Streamlit
- Scikit-learn
- Plotly
- Pandas, NumPy
- XlsxWriter (for reports)

Usage Instructions

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1. Clone the repository
2. Install required libraries (pip install -r requirements.txt)
3. Run the app with: streamlit run app.py
4. Upload your CSV and start analyzing