HR ATTRITION ANALYTICS PROJECT REPORT

Abstract:

This project analyzes employee attrition using data-driven techniques to identify the major factors influencing resignations. A machine learning classification model is built to predict high risk employees, and insights are visualized in Power BI for decision-making.

Introduction :

Employee attrition is a major challenge for organizations and impacts productivity, hiring costs, and institutional knowledge. Using analytics, it becomes possible to uncover hidden trends and proactively reduce turnover. This project demonstrates a complete attrition prediction pipeline using Python and Power BI.

Tools Used:

• Python (Pandas, Seaborn, ScikitLearn)

• Jupyter Notebook

• Power BI Desktop

• SHAP (model explainability)

Steps Involved in Building the Project:

- 1. Data Collection & Cleaning: Loaded HR dataset, handled missing values, encoded categories, and prepared numerical features.

- 2. Exploratory Data Analysis: Identified key patterns like department wise attrition, salary bands, promotion delays, and workload impact.

- 3. Model Building: Implemented Logistic Regression with a preprocessing pipeline. Model performance evaluated using accuracy and confusion matrix.

- 4. Explainability: Used SHAP values to understand feature importance such as job role, years at company, and monthly income.

- 5. Power BI Dashboard: Built interactive visuals showing attrition trends, high risk employees, and key drivers.

- 6. Recommendations: Provided insights for reducing attrition including promotion reviews, workload balancing, and employee engagement Initiatives.

Conclusion:

This project demonstrates how analytics can help organizations proactively manage employee attrition. By combining machine learning, explainable AI, and interactive dashboards, HR teams can identify high risk employees early and implement targeted interventions to improve retention.