

# HR Analytics - Predict Employee Attrition

## Introduction

The HR Analytics project focuses on predicting employee attrition using historical work force data. Attrition is a critical concern for organizations as it directly affects productivity, operational efficiency, and overall costs. The project leverages data analytics and machine learning models to identify key factors that influence employee attrition and provides actionable insights through an interactive dashboard built in Power BI.

## Abstract

This project involves analyzing employee data to build a predictive model that determines the likelihood of employee attrition. The machine learning model was trained on various features such as job role, monthly income, job satisfaction, years at the company, and work-life balance. The insights derived from the model were visualized through Power BI dashboards, enabling HR departments to make data-driven decisions for employee retention strategies.

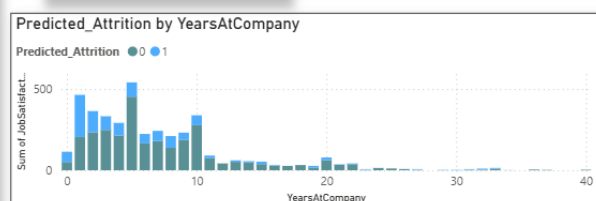
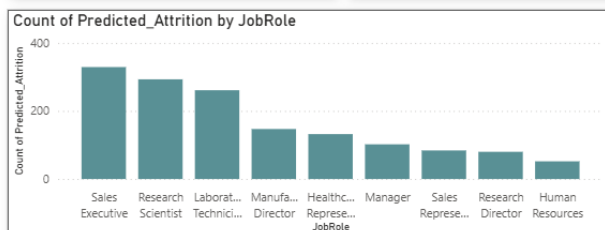
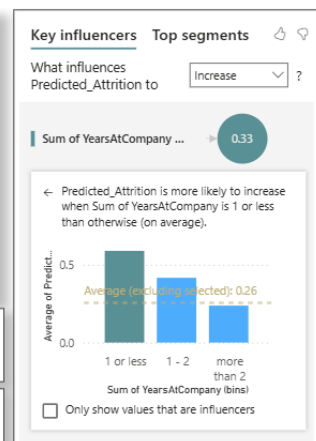
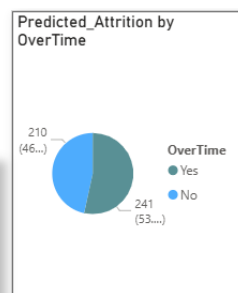
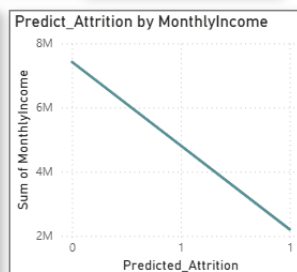
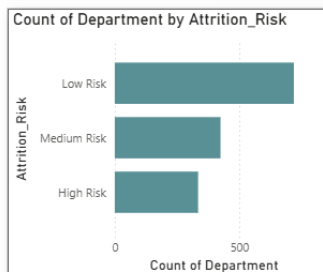
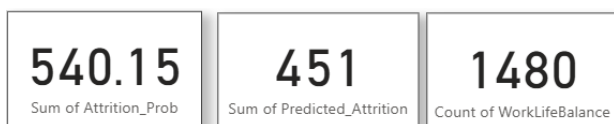
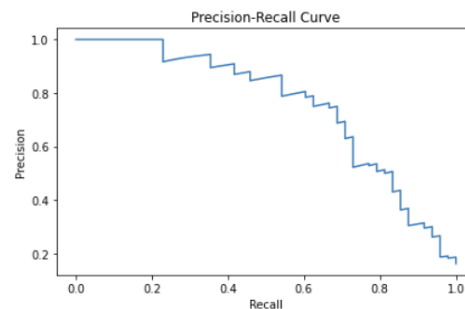
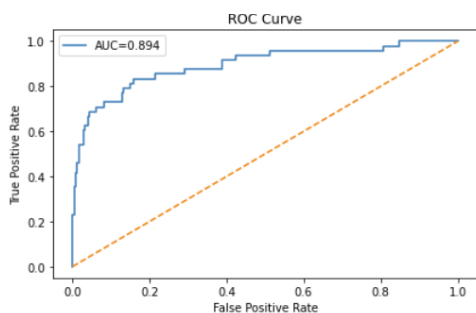
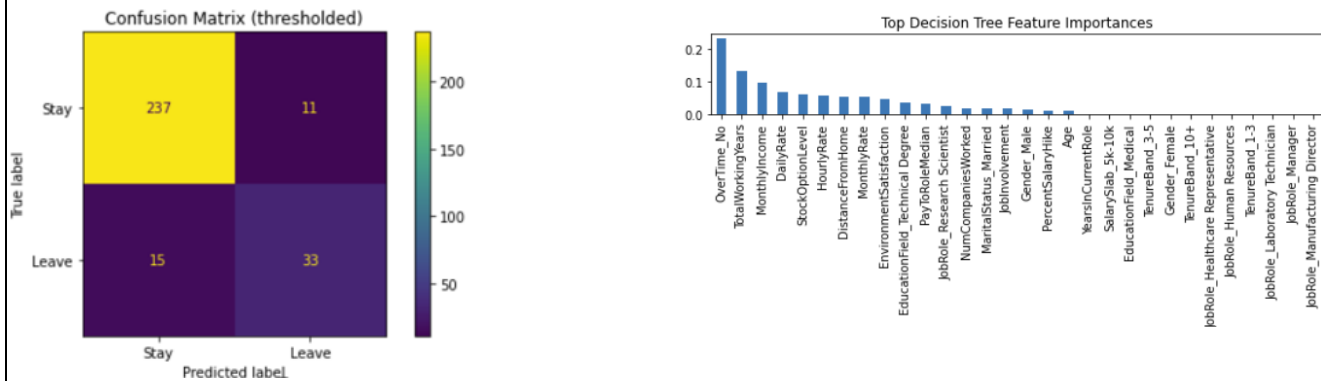
## Tools Used

1. Python (Pandas, NumPy, Scikit-learn, Matplotlib, Seaborn) – for data preprocessing, analysis, and model building.
2. Jupyter Notebook – for development and experimentation.
3. Power BI – for creating an interactive dashboard to visualize attrition predictions and key insights.

## Steps Involved in Building the Project

1. **Data Collection** – Used the employee dataset containing demographic, work-related, and performance attributes.
2. **Data Preprocessing** – Handled missing values, encoded categorical variables, and normalized features.
3. **Exploratory Data Analysis (EDA)** – Identified key trends and patterns related to attrition factors.
4. **Model Building** – Implemented machine learning models such as Logistic Regression and Random Forest for attrition prediction.
5. **Model Evaluation** – Evaluated models using accuracy, precision, recall, and ROC-AUC score.
6. **Dashboard Creation** – Built an interactive dashboard in Power BI to present predictions and insights visually.

## Diagrams & Dashboards



## Conclusion

The HR Analytics project successfully demonstrated how data-driven approaches can help organizations predict employee attrition and design effective retention strategies. The interactive Power BI dashboard enables HR managers to identify high-risk employees, analyze influencing factors such as income and job satisfaction, and take proactive measures to improve employee engagement and reduce attrition.