# HR Analytics – Employee Attrition Prediction

## 1. Introduction

Employee attrition is a critical challenge for organizations. This project focuses on analyzing the key factors contributing to attrition using data analysis and machine learning techniques. The aim is to support HR teams in identifying and preventing employee turnover.

## 2. Abstract

This project leverages Python and Power BI to analyze employee attrition trends and predict future resignations. Using the IBM HR Analytics dataset, we performed exploratory data analysis, built classification models, and developed an interactive Power BI dashboard. Insights derived help in strategizing employee retention.

## 3. Tools Used

- Python (Pandas, Seaborn, scikit-learn)  
- Power BI (Data Visualization)  
- DAX (KPI Calculations)  
- Jupyter Notebook  
- Microsoft Excel  
- GitHub (Project Hosting)

## 4. Steps Involved in Building the Project

1. Loaded and cleaned the IBM HR dataset.  
2. Performed Exploratory Data Analysis (EDA) to understand attrition patterns across job roles, income, tenure, and overtime.  
3. Built classification models using Logistic Regression and Decision Tree.  
4. Evaluated model performance using accuracy, precision, recall, and confusion matrix.  
5. Created interactive visuals in Power BI to highlight attrition trends.  
6. Shared insights and suggestions through an engaging dashboard and this report.

## 5. Conclusion

The analysis revealed that employees with high overtime, lower salary, and short tenure are more likely to leave. Job satisfaction and role type also strongly influence attrition. The final Power BI dashboard visually communicates these insights, helping HR make data-driven retention decisions.