**Employee Performance & Attrition Analysis 🚀**

**📌 Overview**

Analyzing key factors affecting employee performance and attrition at IBM using Python. This project uncovers insights that help organizations make data-driven HR decisions.

### **Key Features:**

* **Employee Demographics**: Age, Gender, Job Role
* **Work Factors**: Salary, Overtime, Commuting Distance, Career Growth
* **Performance Metrics**: Training Hours, Performance Rating, Attrition

**🛠 Tools & Libraries**

* **Python**
* pandas – Data Cleaning & Analysis
* numpy – Numerical Computations
* seaborn – Data Visualization
* matplotlib – Graphical Representation

## 📊 Key Insights & Findings

### 🔹 1. **Low Salary Increases Attrition**

* Employees with lower salaries tend to leave for better opportunities.
* **Solution:** Offer competitive pay to retain talent.

### 🔹 2. **Long Commuting Distance Leads to Resignations**

* Employees with long commutes report higher dissatisfaction.
* **Solution:** Implement remote/hybrid work options.

### 🔹 3. **Excessive Overtime Causes Burnout**

* Employees working long hours experience fatigue & lower productivity.
* **Solution:** Limit excessive overtime and encourage work-life balance.

### 🔹 4. **Lack of Career Growth Pushes Employees Away**

* Employees without clear growth opportunities seek jobs elsewhere.
* **Solution:** Provide mentorship and promotion pathways.

### 🔹 5. **Poor Work-Life Balance Increases Attrition**

* Employees struggling with work-life balance are more likely to resign.
* **Solution:** Offer flexible schedules and wellness programs.

### 🔹 6. **New Employees Have a Higher Attrition Rate**

* Adjustment issues lead to early resignations.
* **Solution:** Strengthen onboarding and engagement programs.

### 🔹 7. **High-Performers Receive External Offers**

* Top employees often get attractive offers from competitors.
* **Solution:** Offer retention bonuses and career development plans.

**📈 Visualizations**

* Heatmaps to show correlations between attrition and key factors.
* Bar charts comparing salary levels and attrition rates.
* Box plots illustrating training hours vs. performance rating.

## 🎯 Business Impact

✅ Helps HR teams **predict & reduce attrition** by addressing key concerns.

✅ Supports **data-driven decision-making** for better retention strategies.

✅ Improves **employee satisfaction & workforce stability**.

**🔮 Future Improvements**

* Implement **Machine Learning** models for attrition prediction.
* Integrate **Tableau/Power BI** for interactive dashboards.
* Use **SQL** for advanced workforce analytics.