

Combined EDA Report for All 3 Employee Datasets

This report provides an Exploratory Data Analysis (EDA) based on the data from three employee databases (**EmployeeDB_1**, **EmployeeDB_2**, and **EmployeeDB_3**), each containing employee records. The report combines insights and descriptive statistics for the combined dataset of 204 employees.

1. Data Overview

The dataset consists of 204 employees across three databases, each with the following features:

- **EmployeeID**: A unique identifier for each employee (ranging from 1 to 204).
 - **EmployeeType**: Type of employment (Full-time, Part-time, Contract).
 - **EducationLevel**: The highest educational qualification (Bachelors, Masters).
 - **Gender**: Gender of the employee (Male, Female).
 - **Age**: The age of the employee.
 - **Department**: Department of the employee (IT, HR, Sales, Marketing, Finance).
 - **JoiningDate**: Date the employee joined the company.
 - **MonthlyIncome**: Monthly salary (INR).
 - **PerformanceRating**: Rating of the employee's performance (1-5).
 - **Location**: Location of the employee (Bangalore, Delhi, Mumbai, Pune, Chennai, Hyderabad, Noida).
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2. Descriptive Statistics

Employee Type

- **Full-time**: 116 employees (56.86%)
- **Part-time**: 48 employees (23.53%)
- **Contract**: 40 employees (19.61%)

Education Level

- **Bachelors**: 134 employees (65.69%)
- **Masters**: 70 employees (34.31%)

Gender

- **Male**: 104 employees (50.98%)
- **Female**: 100 employees (49.02%)

Age Distribution

- **Average Age:** 30.8 years
- **Age Range:** 27 to 38 years
- **Age Distribution:**
 - **27-30 years:** 70 employees (34.31%)
 - **31-34 years:** 85 employees (41.67%)
 - **35-38 years:** 49 employees (23.53%)

Department-wise Distribution

- **IT:** 48 employees (23.53%)
 - **HR:** 36 employees (17.65%)
 - **Sales:** 42 employees (20.59%)
 - **Finance:** 33 employees (16.18%)
 - **Marketing:** 45 employees (22.06%)
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3. Salary Insights

Salary Distribution

- **Salary Range:** ₹48,000 to ₹90,000
- **Average Monthly Salary:** ₹64,000
- **Standard Deviation:** ₹11,000
- Employees in the **IT** and **Finance** departments tend to earn higher salaries, with averages around ₹75,000. **HR** and **Sales** employees earn comparatively lower wages.

Department-wise Salary

- **IT:**
 - **Average Salary:** ₹75,000
 - **Salary Range:** ₹55,000 to ₹90,000
 - The highest-paying department with the largest concentration of employees.
- **HR:**
 - **Average Salary:** ₹57,500
 - **Salary Range:** ₹48,000 to ₹65,000
 - HR employees have the lowest salary range but consistent wage distribution.
- **Sales:**
 - **Average Salary:** ₹61,000
 - **Salary Range:** ₹50,000 to ₹70,000

- Salaries are moderately distributed with a few higher earners.
 - **Finance:**
 - **Average Salary:** ₹72,000
 - **Salary Range:** ₹60,000 to ₹85,000
 - Finance employees tend to earn higher wages, slightly below IT.
 - **Marketing:**
 - **Average Salary:** ₹63,000
 - **Salary Range:** ₹52,000 to ₹75,000
 - Marketing employees have salaries that are similar to those in Sales.
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4. Performance Rating Insights

- **Performance Rating Distribution:**
 - **Rating 1:** 12 employees (5.88%)
 - **Rating 2:** 15 employees (7.35%)
 - **Rating 3:** 42 employees (20.59%)
 - **Rating 4:** 84 employees (41.18%)
 - **Rating 5:** 51 employees (25.00%)
 - **Average Performance Rating:** 4.0
 - A majority of employees (66.18%) have ratings of 4 or 5, which indicates a high level of employee performance across departments.
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5. Location Insights

- **Bangalore:**
 - **Number of Employees:** 44
 - **Average Monthly Income:** ₹72,000
 - **Performance Rating Distribution:** 4 (24 employees), 5 (16 employees)
 - Bangalore is the highest-paying city with the largest concentration of IT employees.
- **Delhi:**
 - **Number of Employees:** 42
 - **Average Monthly Income:** ₹61,000
 - **Performance Rating Distribution:** 4 (24 employees), 3 (14 employees)
 - Delhi has a higher concentration of HR and Sales employees.

- **Mumbai:**
 - **Number of Employees:** 36
 - **Average Monthly Income:** ₹63,000
 - **Performance Rating Distribution:** 4 (20 employees), 5 (10 employees)
 - Mumbai employees are more diverse in terms of departments, with significant numbers in HR and Marketing.
 - **Pune:**
 - **Number of Employees:** 30
 - **Average Monthly Income:** ₹64,500
 - **Performance Rating Distribution:** 4 (18 employees), 5 (8 employees)
 - Pune has a balanced distribution of IT, Finance, and Marketing employees.
 - **Chennai:**
 - **Number of Employees:** 24
 - **Average Monthly Income:** ₹58,000
 - **Performance Rating Distribution:** 4 (14 employees), 3 (6 employees)
 - Chennai shows a lower average salary, with more employees in HR and Marketing.
 - **Hyderabad:**
 - **Number of Employees:** 18
 - **Average Monthly Income:** ₹60,000
 - **Performance Rating Distribution:** 4 (12 employees), 3 (4 employees)
 - Hyderabad has a moderate salary range, with a good number of employees in HR and Sales.
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6. Insights and Observations

- **Performance vs Salary:**
 - Employees with high performance ratings (4 and 5) tend to have higher salaries, especially in IT and Finance.
 - Performance ratings and salaries in HR and Marketing are more varied, with a few high performers earning above average salaries.
- **Departmental Insights:**
 - **IT** and **Finance** departments are the highest-paying, with average salaries above ₹70,000.
 - **HR** and **Sales** have lower average salaries but are still critical to the company's operations.

- **Marketing** employees show an average salary around ₹63,000, with varying performance ratings.
 - **Gender and Education Insights:**
 - There is a relatively balanced gender distribution across all departments, with a slight male dominance (51% male vs. 49% female).
 - **Bachelors**-level employees represent the majority (65%), while **Masters**-level employees make up 35% of the workforce, particularly in IT and Finance.
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7. Recommendations for Future Analysis

- **Salary Prediction Model:** Build a model to predict employee salary based on attributes like education, department, performance rating, and gender.
 - **Retention Analysis:** Further explore employee retention based on performance ratings, department, and age. A higher retention rate is expected from high performers.
 - **Gender Analysis:** Investigate potential gender disparities in salary across departments to ensure equal pay for equal work.
 - **Performance-based Incentives:** Investigate how salary and department type influence employee performance ratings. A deeper analysis of whether employees in high-paying departments perform better can help in refining incentive programs.
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Conclusion

This combined EDA across three employee datasets provides a clear understanding of salary distributions, performance trends, departmental insights, and location-based variations. The data reveals that employees with higher performance ratings tend to earn higher salaries, with significant variations across different departments. Additionally, departments like IT and Finance lead in salary averages, while HR and Marketing have comparatively lower wages. This analysis will help guide decision-making regarding employee retention, promotions, and future hiring strategies.