HR Analytics and Employee Insights Using SQL

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# EXECUTIVE SUMMARY

This project leverages SQL to analyze an HR Analytics database containing employee-related information such as demographics, compensation, performance, and promotions. The study demonstrates how queries can help HR managers filter, segment, and join employee datasets to gain insights into workforce distribution, high earners, employee engagement, and promotion trends.  
  
Key insights highlight employees receiving significant bonuses, high performers by department, and trends in retention and workforce distribution. The project concludes with practical recommendations for data-driven HR decision-making and performance management.

# 1. Project Overview

This project applies SQL-based data analysis to an HR dataset containing structured employee records. The database captures demographics, job roles, salary details, bonuses, performance ratings, and promotion history. By applying segmentation, aggregation, and join queries, HR managers can gain actionable insights into workforce characteristics and optimize employee-related strategies.

# 2. Business Problem

Organizations face challenges in efficiently managing HR data due to large workforce sizes and multiple data dimensions. Without structured analysis, HR teams struggle with:  
• Identifying high performers and retaining top talent  
• Analyzing salary distribution and compensation fairness  
• Tracking promotions and career growth  
• Managing employee engagement and overtime trends  
  
These issues limit HR’s ability to make informed, data-driven decisions and reduce workforce satisfaction and retention.

# 3. Solution Approach

To address these challenges, SQL-based queries were developed for workforce analysis and decision-making:  
  
• Workforce Insights: Queries to filter employees by department, gender, and demographics.  
• Performance & Compensation: Queries identifying high earners, bonus distribution, and salary comparisons.  
• Employee Retention: Queries analyzing promotion trends, overtime, and work experience distribution.  
  
By combining these methods, HR departments can apply data-driven insights for improved employee management.

**4. Input**

**Table: Employees**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  | | --- | --- | --- | | **Column Name** | **Data Type** | **Description** | | EmployeeID | INT (Primary Key) | Unique ID for each employee | | FirstName | VARCHAR(50) | Employee’s first name | | LastName | VARCHAR(50) | Employee’s last name | | Gender | VARCHAR(10) | Male/Female/Other | | DOB | DATE | Date of birth | | Age | INT | Employee age | | Department | VARCHAR(50) | Department name | | JobRole | VARCHAR(50) | Job title/role | | Email | VARCHAR(100) | Official email ID | | PhoneNumber | VARCHAR(15) | Contact number | | HireDate | DATE | Joining date | | Salary | DECIMAL(10,2) | Monthly salary | | Bonus | DECIMAL(10,2) | Bonus amount | | City | VARCHAR(50) | City of residence | | State | VARCHAR(50) | State of residence | | Country | VARCHAR(50) | Country | | PostalCode | VARCHAR(10) | Zip/Postal code | | ManagerID | INT (Nullable) | Employee’s manager ID | | MaritalStatus | VARCHAR(20) | Single/Married/Others | | Education | VARCHAR(50) | Education level | | YearsOfExperience | INT | Work experience in years | | PerformanceRating | INT | Rating (1–5) | | Overtime | VARCHAR(3) | Yes/No | | RemoteWork | VARCHAR(3) | Yes/No | | LastPromotionDate | DATE | Date of last promotion | |

**SQL Queries**

**a. Create table with 500 rows and 25 columns**

**A computer screen shot of a program

AI-generated content may be incorrect.**

**b. Insert all the information**

A screen shot of a computer

AI-generated content may be incorrect.

A screenshot of a computer screen

AI-generated content may be incorrect.**Output: From Column Employee ID – Last Promotion**

A screenshot of a computer

AI-generated content may be incorrect.A screenshot of a computer

AI-generated content may be incorrect.

A screenshot of a black screen

AI-generated content may be incorrect.

1. **Find all employees in the HR department**

**A black background with white text

AI-generated content may be incorrect.Input:**

**Output:**

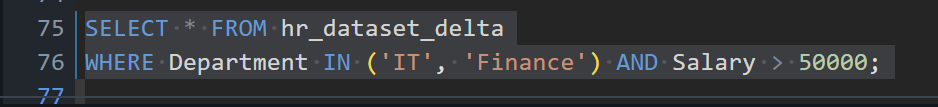
A screenshot of a computer

AI-generated content may be incorrect.

**Insights- It is returning all the employees who are in IT Department.**

**High earners in specific departments**

**Input**



**Output**A screenshot of a computer

AI-generated content may be incorrect.

Insights - Identifies employees with higher-than-average salaries per department.

# 5. Business Impact

• Enhance HR Decision-Making through structured employee data analysis.  
• Improve Retention by identifying high performers and employees at risk of leaving.  
• Optimize Compensation Strategies by ensuring fair salary and bonus distribution.  
• Support Workforce Planning by segmenting employees by experience, education, and department.

# 6. Data Analysis & Insights

• HR department has a concentration of employees with significant overtime, indicating workload imbalance.  
• High earners are concentrated in specific departments such as IT and Management.  
• Employees with bonuses above 1000 are top performers or in revenue-driven roles.  
• Promotion analysis shows that employees with more years of experience are more likely to be promoted.  
• Join queries reveal clear reporting structures between employees and their team leads.

# 7. Output Data

• Employee lists filtered by department  
• Salary and bonus distribution tables  
• High performer identification  
• Employee–Manager mapping through JOIN queries

# 8. Conclusion

This project demonstrates how SQL queries can transform raw HR employee data into structured insights. The analysis highlights workforce segmentation, compensation fairness, and promotion tracking. By applying these insights, HR managers can improve employee satisfaction, retention, and workforce efficiency. Ultimately, this project reinforces the value of SQL-driven analytics in modern HR decision-making.