**📘 Day 43 – SQL Challenge (Intermediate–Advanced)**

**Dataset: Employee Performance & Projects**

**Table: Employees**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **EmpID** | **Name** | **Department** | **JoinDate** | **Salary** | **ManagerID** |
| 1 | Alice | IT | 2019-01-15 | 75000 | NULL |
| 2 | Bob | IT | 2020-03-10 | 60000 | 1 |
| 3 | Charlie | HR | 2018-06-05 | 50000 | NULL |
| 4 | Diana | HR | 2021-02-20 | 45000 | 3 |
| 5 | Ethan | Finance | 2017-11-12 | 85000 | NULL |
| 6 | Fiona | Finance | 2020-08-01 | 55000 | 5 |
| 7 | George | IT | 2021-05-10 | 58000 | 2 |
| 8 | Hannah | HR | 2019-09-25 | 52000 | 3 |
| 9 | Ian | Finance | 2022-01-12 | 48000 | 6 |
| 10 | Jack | IT | 2019-11-11 | 62000 | 1 |

**Table: Projects**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ProjectID** | **ProjectName** | **Department** | **Budget** | **StartDate** | **EndDate** |
| 101 | Payroll System | HR | 200000 | 2020-01-01 | 2020-12-31 |
| 102 | Fraud Detection | Finance | 300000 | 2020-06-15 | 2021-06-15 |
| 103 | Cloud Upgrade | IT | 250000 | 2021-01-01 | 2021-12-31 |
| 104 | HR Portal | HR | 150000 | 2021-07-01 | 2022-06-30 |
| 105 | Trading System | Finance | 400000 | 2021-09-01 | 2022-08-31 |
| 106 | AI Chatbot | IT | 350000 | 2022-01-01 | 2022-12-31 |

**Table: EmployeeProjects**

|  |  |  |  |
| --- | --- | --- | --- |
| **EmpID** | **ProjectID** | **HoursWorked** | **Rating** |
| 2 | 103 | 1600 | 4.5 |
| 7 | 103 | 1200 | 4.2 |
| 10 | 103 | 1400 | 4.8 |
| 4 | 101 | 1000 | 4.1 |
| 8 | 101 | 800 | 3.9 |
| 4 | 104 | 1200 | 4.3 |
| 8 | 104 | 900 | 4.0 |
| 6 | 102 | 1800 | 4.6 |
| 9 | 105 | 1000 | 4.2 |
| 6 | 105 | 1600 | 4.5 |
| 2 | 106 | 1500 | 4.7 |
| 7 | 106 | 1400 | 4.4 |

**❓ Day 43 Questions (Intermediate–Advanced)**

1. Find the **average salary per department** and rank departments by salary using a window function.
2. List employees who are **managers** (i.e., have subordinates).
3. Identify the **employee with the highest total hours worked across all projects**.
4. For each project, find the **top-rated employee (highest rating)** using ROW\_NUMBER().
5. Write a query to calculate the **total budget handled by each department** and rank them.
6. Find employees who have **worked on more than 1 project**.
7. Calculate the **employee-wise weighted average rating** (weighted by HoursWorked).
8. Retrieve employees who **earn above their departmental average salary**.
9. Using a **recursive CTE**, list the **hierarchy of employees under manager Alice (EmpID=1)**.
10. **Bonus Challenge 🎯**: Find the **top 3 employees across the company** who contributed the **most hours** to projects in 2021 only.