

SQL Queries to mastering Windows Functions

Query 1: Ranking Employee Salaries Within Each Department

- Business Question: "How does each employee's monthly income rank within their respective department? Show the difference between `ROW_NUMBER`, `RANK`, and `DENSE_RANK`."
- Window Function(s) Used: `ROW_NUMBER()`, `RANK()`, `DENSE_RANK()`

Query 2: Comparing Individual Income to the Department Average

- Business Question: "For each employee, show their monthly income alongside the average monthly income for their department, and calculate the difference."
- Window Function(s) Used: `AVG()`

Query 3: Identifying the Top 3 Employees by Salary Hike per Department

- Business Question: "Who are the three employees who received the highest percentage salary hike in each department?"
- Window Function(s) Used: `RANK()`, Common Table Expression (CTE)

Query 4: Assigning Employees to Salary Quartiles

- Business Question: "Divide employees within each job level into four salary quartiles to understand income distribution."
- Window Function(s) Used: `NTILE(4)`

Query 5: Displaying Department Headcount on Each Employee Row

- Business Question: "For each employee, show the total number of people who work in their department."
- Window Function(s) Used: `COUNT()`

Query 6: Calculating the Salary Gap to the Next Highest-Paid Colleague

- Business Question: "Within each department, what is the salary difference between each employee and the person who is paid just above them?"
- Window Function(s) Used: `LAG()`

Query 7: Comparing an Employee's Salary to the Department's Highest Earner

- Business Question: "For every employee, show their salary next to the absolute highest salary in their department."
- Window Function(s) Used: `FIRST_VALUE()`

Query 8: Calculating a 3-Person Moving Average of Job Satisfaction by Tenure

- Business Question: "To smooth out fluctuations, what is the 3-person moving average of job satisfaction scores, ordered by tenure (`YearsAtCompany`), within each job role?"
- Window Function(s) Used: `AVG()` with a framing clause

Query 9: Identifying Employees Earning Less Than the Previous Hire in Their Role

- Business Question: "Are there instances where a new hire in a specific job role is earning less than the person hired just before them? (Assuming `EmployeeNumber` approximates hiring order)."
- Window Function(s) Used: `LAG()`

Query 10: Calculating Each Employee's Contribution to Departmental Salary

- Business Question: "What percentage of the total departmental salary budget does each employee's monthly income represent?"
- Window Function(s) Used: `SUM()`

Query 11: Finding the Most Recently Promoted Employee in Each Department

- Business Question: "For each department, who is the employee with the fewest years since their last promotion?"
- Window Function(s) Used: `FIRST_VALUE()`

Query 12: Ranking Departments by Their Highest Individual Salary Hike

- Business Question: "Which department gave the single largest percentage salary hike to an individual employee, and what was that percentage?"
- Window Function(s) Used: `MAX()`, `DENSE_RANK()`

Query 13: Identifying Junior Employees Earning More Than Senior Averages

- Business Question: "Find all employees at Job Level 1 whose monthly income is higher than the average monthly income of all employees at Job Level 2."
- Window Function(s) Used: `AVG()` combined with a subquery

Query 14: Calculating the Cumulative Distribution of Job Satisfaction

- Business Question: "What is the cumulative distribution of employees based on their job satisfaction score? In other words, what percentage of employees have a satisfaction score less than or equal to the current employee's score?"
- Window Function(s) Used: `CUME_DIST()`

Query 15: Finding the Salary Difference from the Lowest-Paid Person in the Role

- Business Question: "For each employee, how much more do they earn than the lowest-paid person who shares their same job role?"
- Window Function(s) Used: `FIRST_VALUE()`