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By

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### Database and Table Check

SELECT \* FROM employees;  
SELECT \* FROM departments;  
SELECT \* FROM projects;  
SELECT \* FROM attendance;  
SELECT \* FROM salary\_history;

### List all employees who joined after 1st Jan 2021

SELECT emp\_name  
FROM employees  
WHERE hire\_date > '2021-01-01';

### Show employee names with their department names (JOIN)

SELECT e.emp\_name, d.dept\_name  
FROM employees AS e  
JOIN departments AS d  
ON e.dept\_id = d.dept\_id;

### Find the highest salary in each department

SELECT MAX(e.salary) AS highest\_salary, d.dept\_name  
FROM employees AS e  
JOIN departments AS d ON e.dept\_id = d.dept\_id  
GROUP BY d.dept\_name;

### Count how many employees were hired in each year

SELECT YEAR(e.hire\_date) AS hired\_year, COUNT(e.emp\_name) AS total\_emp  
FROM employees AS e  
GROUP BY hired\_year  
ORDER BY hired\_year DESC;

### Show employee name, salary, and their manager’s name

SELECT e.emp\_name AS employee\_name, e.salary, m.emp\_name AS manager\_name  
FROM employees AS e  
LEFT JOIN employees AS m  
ON e.manager\_id = m.emp\_id;

### Rank employees by salary in each department (highest salary = rank 1)

SELECT \*  
FROM (  
 SELECT e.emp\_name, e.salary, d.dept\_name,  
 RANK() OVER(PARTITION BY d.dept\_name ORDER BY e.salary DESC) AS rnk  
 FROM employees AS e  
 JOIN departments AS d ON e.dept\_id = d.dept\_id  
) t  
WHERE rnk = 1;

### Find the second highest salary in the company

-- Simple approach  
SELECT emp\_name, salary  
FROM employees  
ORDER BY salary DESC  
LIMIT 1 OFFSET 1;  
  
-- Window function approach (handles ties)  
SELECT emp\_name, salary  
FROM (  
 SELECT emp\_name, salary, RANK() OVER(ORDER BY salary DESC) AS rnk  
 FROM employees  
) t  
WHERE rnk = 2;

### Show running total of salaries ordered by hire date

SELECT emp\_name, hire\_date, salary,  
 SUM(salary) OVER(ORDER BY hire\_date) AS running\_total  
FROM employees  
ORDER BY hire\_date;

### Find the average salary per department and show employees earning above that average

SELECT emp\_name, salary, dept\_name, avg\_salary  
FROM (  
 SELECT e.emp\_name, e.salary, d.dept\_name,  
 ROUND(AVG(e.salary) OVER(PARTITION BY d.dept\_name), 0) AS avg\_salary  
 FROM employees AS e  
 JOIN departments AS d ON e.dept\_id = d.dept\_id  
) t  
WHERE salary > avg\_salary  
ORDER BY dept\_name, salary DESC;

### Find how many employees were hired in each month of each year

SELECT YEAR(hire\_date) AS hire\_year, MONTHNAME(hire\_date) AS hire\_month,  
 COUNT(emp\_name) AS total\_emp  
FROM employees  
GROUP BY YEAR(hire\_date), MONTHNAME(hire\_date)  
ORDER BY hire\_year, MONTH(hire\_date);

### Find the department-wise highest-paid employee

SELECT emp\_name, salary\_rank, dept\_name  
FROM (  
 SELECT e.emp\_name, e.salary, d.dept\_name,  
 DENSE\_RANK() OVER(PARTITION BY d.dept\_name ORDER BY e.salary DESC) AS salary\_rank  
 FROM employees AS e  
 JOIN departments AS d ON e.dept\_id = d.dept\_id  
) t  
WHERE salary\_rank = 1  
ORDER BY dept\_name DESC;