



HR. ANALYTICS - SQL PROJECT

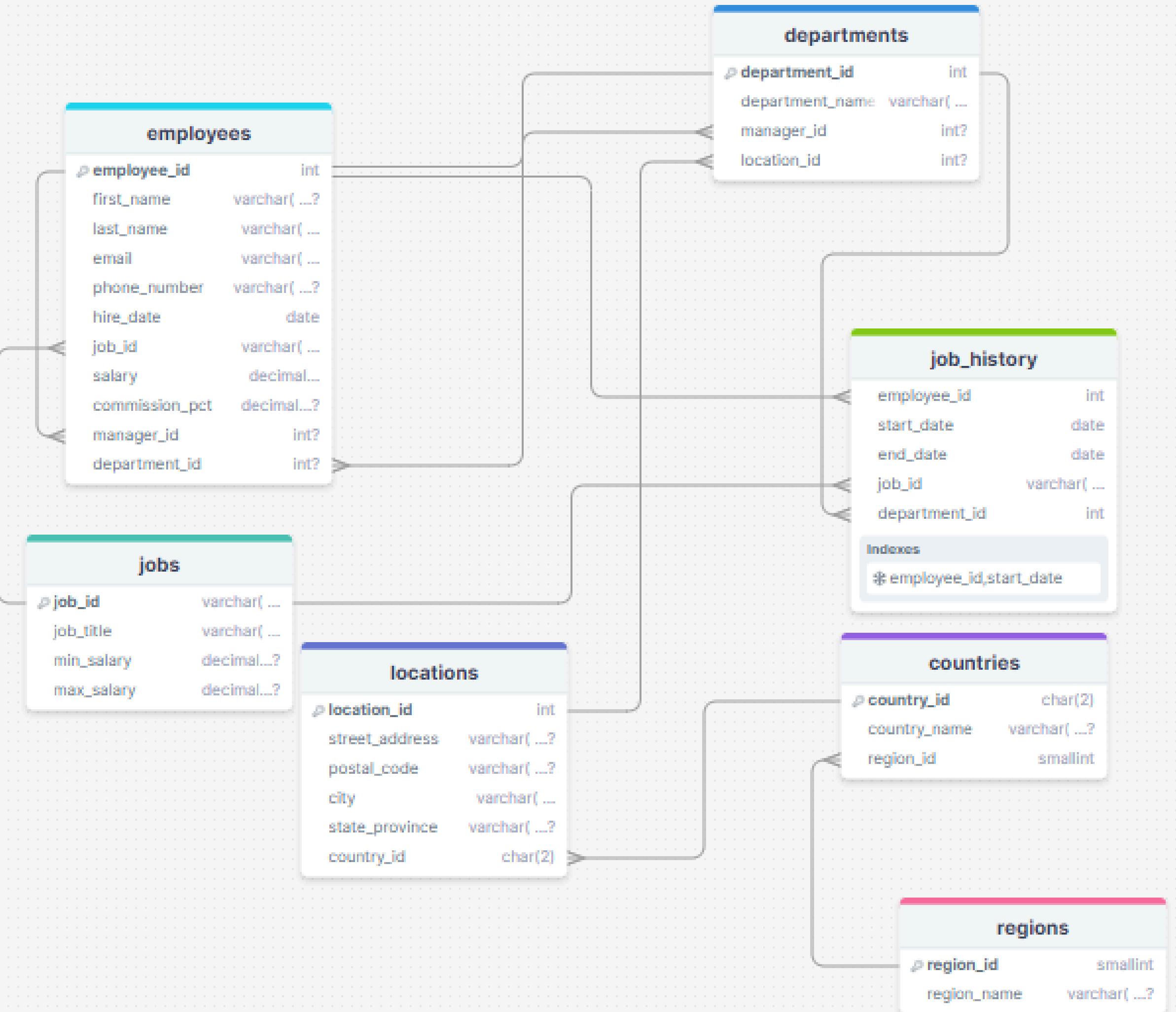


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SCHEMA DIAGRAM

Table Names

- Employees
- Departments
- Jobs
- Job_History
- Locations
- Regions
- Countries



Total number of employees in the company

```
SELECT count(*) AS total_employees  
FROM employees;
```

	total_employees
107	107

Number of employees in each department

```
SELECT e.department_id, d.department_name,  
       count(*) as number_of_employees  
  FROM employees e  
 LEFT JOIN departments d  
    ON e.department_id = d.department_id  
 GROUP BY e.department_id;
```

	department_id	department_name	number_of_employees
	NULL	NULL	1
	10	Administration	1
	20	Marketing	2
	30	Purchasing	6
	40	Human Resources	1
	50	Shipping	45
	60	IT	5
	70	Public Relations	1
	80	Sales	34
	90	Executive	3
	100	Finance	6
	110	Accounting	2

Average salary department wise

```
SELECT
    e.department_id, avg(e.salary) AS avg_salary
FROM
    employees e
LEFT JOIN
    departments d ON e.department_id =
d.department_id
GROUP BY
    e.department_id
ORDER BY
    avg_salary asc;
```

	department_id	avg_salary
	50	3475.555556
	30	4150.000000
	10	4400.000000
	60	5760.000000
	40	6500.000000
	NULL	7000.000000
	100	8600.000000
	80	8955.882353
	20	9500.000000
	70	10000.000000
	110	10150.000000
	90	19333.333333

Number of employees in each country

```
SELECT c.country_name,  
       COUNT(e.employee_id) AS number_of_employees  
  FROM  
    employees e  
 JOIN  
    departments d ON e.department_id = d.department_id  
 JOIN  
    locations l ON d.location_id = d.location_id  
 JOIN  
    countries c  ON l.country_id = c.country_id  
 GROUP BY  
    c.country_name;
```

	country_name	number_of_employees
	Australia	106
	Brazil	106
	Canada	212
	Switzerland	212
	China	106
	Germany	106
	India	106
	Italy	212
	Japan	212
	Mexico	106
	Netherlands	106
	Singapore	106
	United Kingdom	318
	United States...	424

-- List all job titles along with the number of employees holding each title.

```
SELECT j.job_title, COUNT(e.employee_id) AS  
employee_count  
FROM employees e  
JOIN jobs j ON j.job_id = e.job_id  
GROUP BY job_title  
ORDER BY employee_count DESC;
```

job_title	employee_count
Sales Representative	30
Shipping Clerk	20
Stock Clerk	20
Accountant	5
Programmer	5
Purchasing Clerk	5
Sales Manager	5
Stock Manager	5
Administration Vice President	2
Public Accountant	1
Accounting Manager	1
Administration Assistant	1
President	1
Finance Manager	1
Human Resources Represen...	1
Marketing Manager	1
Marketing Representative	1
Public Relations Representa...	1
Purchasing Manager	1

-- Identify the departments with the highest and lowest average salaries.

-- department with hisghest salary

```
(SELECT d.department_name, round(avg(e.salary),2)
AS avg_salary
FROM employees e
JOIN departments d
ON e.department_id = d.department_id
GROUP BY d.department_name
ORDER BY avg_salary desc
LIMIT 1)
```

UNION

-- department with lowest salary

```
(SELECT d.department_name, round(avg(e.salary),2)
as avg_salary
FROM employees e
JOIN departments d ON e.department_id =
d.department_id
GROUP BY d.department_name
ORDER BY avg_salary asc
LIMIT );
```

	department_name	avg_salary
▶	Executive	19333.33
	Shipping	3475.56

-- Calculate the tenure (in years) of each employee based on their hire date.

```
SELECT CONCAT(e.first_name," ",e.last_name) AS full_name,  
       ROUND(CASE  
             WHEN MAX(jh.end_date) IS NOT NULL THEN  
                 DATEDIFF(MAX (jh.end_date),e.hire_date)/365  
             ELSE datediff(curdate() ,e.hire_date)/365  
           END, 2) AS tenure  
  FROM employees e  
 LEFT JOIN job_history jh  
    ON e.employee_id = jh.employee_id AND e.job_id = jh.job_id  
 GROUP BY e.employee_id, full_name, e.hire_date  
 ORDER BY tenure desc;
```

	full_name	tenure
▶	Steven King	37.10
	Neena Kochhar	34.83
	Alexander Hunold	34.55
	Bruce Ernst	33.17
	Lex De Haan	31.52
	Susan Mavris	30.12
	Hermann Baer	30.12
	Shelley Higgins	30.12
	William Gietz	30.12
	Nancy Greenberg	29.93
	Daniel Faviet	29.93
	Den Raphaely	29.62
	Payam Kaufling	29.22
	Alexander Khoo	29.18
	Renske Ladwig	29.02
	Trenna Rajs	28.76
	Nandita Sarchand	28.48
	Janette King	28.47
	Sarah Bell	28.46

	full_name	tenure
	Kevin Mourgos	24.67
	Oliver Tuvault	24.65
	Luis Popp	24.62
	Ki Gee	24.60
	Randall Perkins	24.58
	Charles Johnson	24.54
	Douglas Grant	24.52
	Mattea Marvins	24.48
	Eleni Zlotkey	24.47
	Girard Geoni	24.46
	Hazel Philtanker	24.45
	David Lee	24.40
	Steven Markle	24.36
	Sundar Ande	24.32
	Amit Banda	24.24
	Sundita Kumar	24.24
	Jennifer Whalen	5.75
	Jonathon Taylor	0.77

-- Create a report showing the distribution of salaries within each job title.

```
SELECT j.job_title,  
       COUNT(e.employee_id) AS  
employee_count,  
       MIN(e.salary) AS min_salary,  
       MAX(e.salary) AS max_salary,  
       FLOOR(AVG(e.salary)) AS avg_salary,  
       ROUND(STDDEV(e.salary),2) AS  
std_deviation_slary  
FROM employees e  
LEFT JOIN jobs j  
ON e.job_id = j.job_id  
GROUP BY j.job_title  
ORDER BY avg_salary desc;
```

job_title	employee_count	min_salary	max_salary	avg_salary	std_deviation_slary
President	1	24000.00	24000.00	24000	0
Administration Vice President	2	17000.00	17000.00	17000	0
Marketing Manager	1	13000.00	13000.00	13000	0
Sales Manager	5	10500.00	14000.00	12200	1363.82
Finance Manager	1	12000.00	12000.00	12000	0
Accounting Manager	1	12000.00	12000.00	12000	0
Purchasing Manager	1	11000.00	11000.00	11000	0
Public Relations Representative	1	10000.00	10000.00	10000	0
Sales Representative	30	6100.00	11500.00	8350	1498.61
Public Accountant	1	8300.00	8300.00	8300	0
Accountant	5	6900.00	9000.00	7920	685.27
Stock Manager	5	5800.00	8200.00	7280	953.73
Human Resources Representa...	1	6500.00	6500.00	6500	0
Marketing Representative	1	6000.00	6000.00	6000	0
Programmer	5	4200.00	9000.00	5760	1722.32
Administration Assistant	1	4400.00	4400.00	4400	0
Shipping Clerk	20	2500.00	4200.00	3215	534.11
Stock Clerk	20	2100.00	3600.00	2785	441.9
Purchasing Clerk	5	2500.00	3100.00	2780	213.54

-- List all employees who do not have a manager.

```
SELECT employee_id, first_name, last_name, manager_id, department_id  
FROM employees  
WHERE manager_id IS NULL;
```

	employee_id	first_name	last_name	manager_id	department_id
▶	100	Steven	King	NULL	90
●	NULL	NULL	NULL	NULL	NULL

-- Find the department(s) that have the most number of locations associated with them.

```
WITH location_counts AS(
    SELECT d.department_id, d.department_name,
        COUNT(distinct d.location_id) as location_count
    FROM departments d
    JOIN locations l
    ON d.location_id = l.location_id
    GROUP BY d.department_id
)
SELECT department_name, location_count
FROM location_counts
WHERE location_count = (select max(location_count) FROM
location_counts);
```

	department_name	location_count
▶	Administration	1
	Marketing	1
	Purchasing	1
	Human Resources	1
	Shipping	1
	IT	1
	Public Relations	1
	Sales	1
	Executive	1
	Finance	1
	Accounting	1
	Treasury	1
	Corporate Tax	1
	Control And Credit	1
	Shareholder Servi...	1
	Benefits	1
	Manufacturing	1
	Construction	1
	Contracting	1

	department_name	location_count
	Finance	1
	Accounting	1
	Treasury	1
	Corporate Tax	1
	Control And Credit	1
	Shareholder Servi...	1
	Benefits	1
	Manufacturing	1
	Construction	1
	Contracting	1
	Operations	1
	IT Support	1
	NOC	1
	IT Helpdesk	1
	Government Sales	1

-- Determine which country has the highest number of employees.

```
SELECT c.country_name,  
       COUNT (e.employee_id) AS num_employees  
  FROM employees e  
 JOIN departments d ON e.department_id = d.department_id  
 JOIN locations l ON d.location_id = d.location_id  
 JOIN countries c ON l.country_id = c.country_id  
 GROUP BY c.country_name  
 ORDER BY num_employees  
 LIMIT 1;
```

	country_name	num_employees
	Singapore	106

-- Compare average salaries for the same job title across different regions and countries. Identify any significant disparities.

```
-- using common table expression
WITH SalaryData as (
    SELECT e.job_id, j.job_title, r.region_name,
c.country_name, e.salary
    FROM employees e
    JOIN departments d ON e.department_id =
d.department_id
    JOIN locations l ON d.location_id = l.location_id
    JOIN countries c ON l.country_id = c.country_id
    JOIN regions r ON c.region_id = r.region_id
    JOIN jobs j ON e.job_id = j.job_id
)
SELECT job_title, region_name, country_name,
AVG(salary) AS avg_salary
FROM SalaryData
GROUP BY job_title, region_name, country_name
ORDER BY job_title, region_name, avg_salary DESC;
```

job_title	region_name	country_name	avg_salary
Accountant	Americas	United States of America	7920.000000
Accounting Manager	Americas	United States of America	12000.000000
Administration Assistant	Americas	United States of America	4400.000000
Administration Vice President	Americas	United States of America	17000.000000
Finance Manager	Americas	United States of America	12000.000000
Human Resources Representative	Europe	United Kingdom	6500.000000
Marketing Manager	Americas	Canada	13000.000000
Marketing Representative	Americas	Canada	6000.000000
President	Americas	United States of America	24000.000000
Programmer	Americas	United States of America	5760.000000
Public Accountant	Americas	United States of America	8300.000000
Public Relations Representative	Europe	Germany	10000.000000
Purchasing Clerk	Americas	United States of America	2780.000000
Purchasing Manager	Americas	United States of America	11000.000000
Sales Manager	Europe	United Kingdom	12200.000000
Sales Representative	Europe	United Kingdom	8396.551724
Shipping Clerk	Americas	United States of America	3215.000000
Stock Clerk	Americas	United States of America	2785.000000
Stock Manager	Americas	United States of America	7280.000000

-- /*Analyze historical job history data to understand employee turnover patterns.*/ --

```
-- average turnover rate
WITH AnnualDepartures AS (
    SELECT year(jh.end_date) AS year_of_departure,
           COUNT(DISTINCT jh.employee_id) AS num_departures
      FROM job_history jh
     WHERE jh.end_date IS NOT NULL
       GROUP BY jh.end_date
)
-- Annual employees each year
, AnnualAvgEmployees AS(
    SELECT YEAR(hire_date) AS year_of_hire_date,
           COUNT(DISTINCT employee_id) AS num_hired
      FROM employees
     GROUP BY year_of_hire_date
)
```

year_of_departure	num_departures	num_hired	turnover_rate
1993	1	1	100.00
1993	1	1	100.00
1997	1	28	3.57
1998	1	23	4.35
1998	2	23	8.70
1999	1	18	5.56
1999	3	18	16.67

```
-- combine ctes to calculate turnover rate
```

```
SELECT a.year_of_departure, a.num_departures,  
COALESCE(b.num_hired, 0) AS num_hired,  
    ROUND(a.num_departures/nullif(b.num_hired,0) *100,2) AS  
turnover_rate  
FROM AnnualDepartures a  
LEFT JOIN AnnualAvgEmployees b ON a.year_of_departure =  
b.year_of_hire_date  
ORDER BY a.year_of_departure;
```

	year_of_departure	num_departures	num_hired	turnover_rate
▶	1993	1	1	100.00
	1993	1	1	100.00
	1997	1	28	3.57
	1998	1	23	4.35
	1998	2	23	8.70
	1999	1	18	5.56
	1999	3	18	16.67

```
-- step-2 average tenure of departed employees
```

```
SELECT  
ROUND(AVG(DATEDIFF(jh.end_date, e.hire_date) / 365.25), 2) AS avg_tenure  
FROM employees e  
JOIN job_history jh ON e.employee_id = jh.employee_id  
WHERE jh.end_date IS NOT NULL;
```

avg_tenure
5.03

-- step 3 - turnover by department and job title

-- turnover by department

WITH DepartmentTurnover AS(

```
SELECT d.department_id, d.department_name,  
COUNT (distinct jh.employee_id) AS num_departures  
FROM job_history jh  
JOIN employees e ON jh.employee_id = e.employee_id  
JOIN departments d ON e.department_id = d.department_id  
WHERE jh.end_date IS NOT NULL  
GROUP BY d.department_id , d.department_name
```

),

DepartmentSize AS (

```
SELECT d.department_id,  
COUNT (distinct e.employee_id) AS num_employees  
FROM departments d  
JOIN employees e ON e.department_id = d.department_id  
GROUP BY d.department_id
```

)

-- combine two ctes to calculate turnover rate

```
SELECT dt.department_name, dt.num_departures, ds.num_employees,  
ROUND(dt.num_departures / nullif(ds.num_employees, 0) *100, 2) AS  
turnover_rate  
FROM DepartmentTurnover dt  
JOIN DepartmentSize ds ON dt.department_id = ds.department_id  
ORDER BY turnover_rate DESC;
```

	department_name	num_departures	num_employees	turnover_rate
▶	Administration	1	1	100.00
	Executive	2	3	66.67
	Marketing	1	2	50.00
	Purchasing	1	6	16.67
	Sales	1	34	2.94
	Shipping	1	45	2.22



```
-- turnover by job title
WITH JobTitleTurnover AS(
    SELECT j.job_id, j.job_title,
        COUNT(DISTINCT jh.employee_id) AS num_departures
    FROM job_history jh
    JOIN employees e ON jh.employee_id = e.employee_id
    JOIN jobs j ON j.job_id = e.job_id
    WHERE jh.end_date IS NOT NULL
    GROUP BY j.job_id, j.job_title
),

JobTitleSize AS(
    SELECT j.job_id,
        COUNT(DISTINCT e.employee_id) AS num_employees
    FROM jobs j
    JOIN employees e ON j.job_id = e.job_id
    GROUP BY j.job_id
)

-- combine two ctes to calculate turnover rate
SELECT
    jt.job_title, jt.num_departures, js.num_employees,
    ROUND(jt.num_departures / NULLIF(js.num_employees, 0) * 100, 2) AS turnover_rate
FROM
    JobTitleTurnover jt
JOIN
    JobTitleSize js ON jt.job_id = js.job_id
ORDER BY
    turnover_rate DESC;
```

job_title	num_departures	num_employees	turnover_rate
Administration Assistant	1	1	100.00
Administration Vice President	2	2	100.00
Marketing Manager	1	1	100.00
Purchasing Manager	1	1	100.00
Stock Manager	1	5	20.00
Sales Representative	1	30	3.33



THANK YOU.