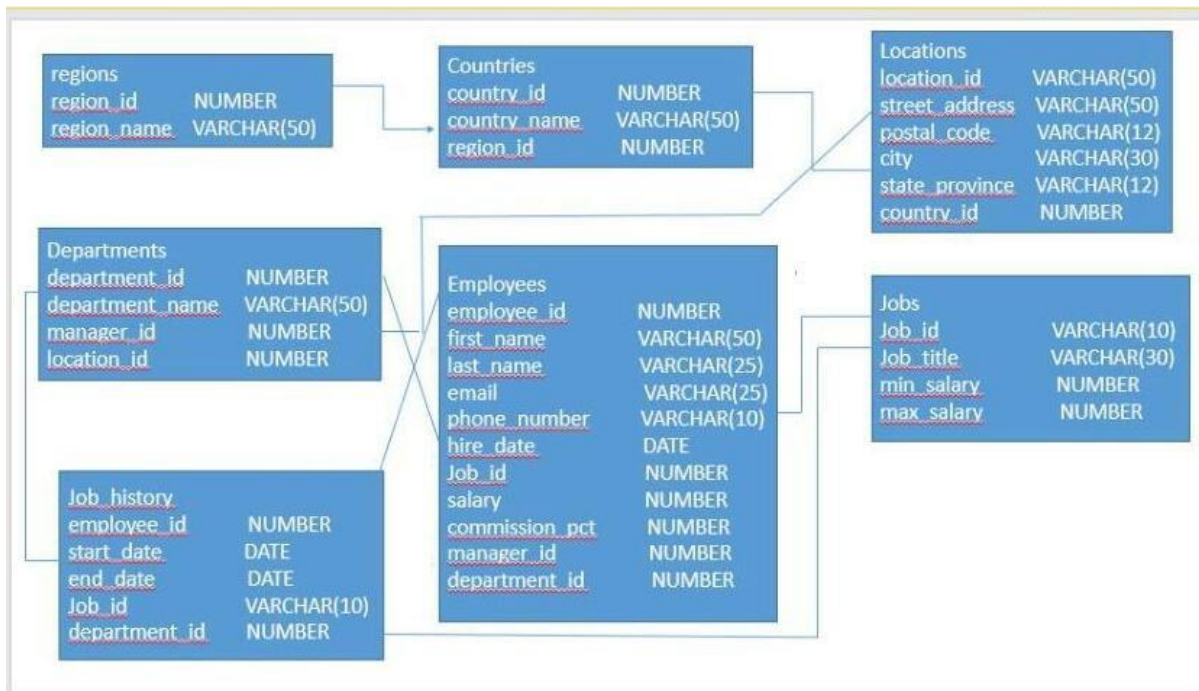


# ASSIGNMENT OF POSTGRESQL

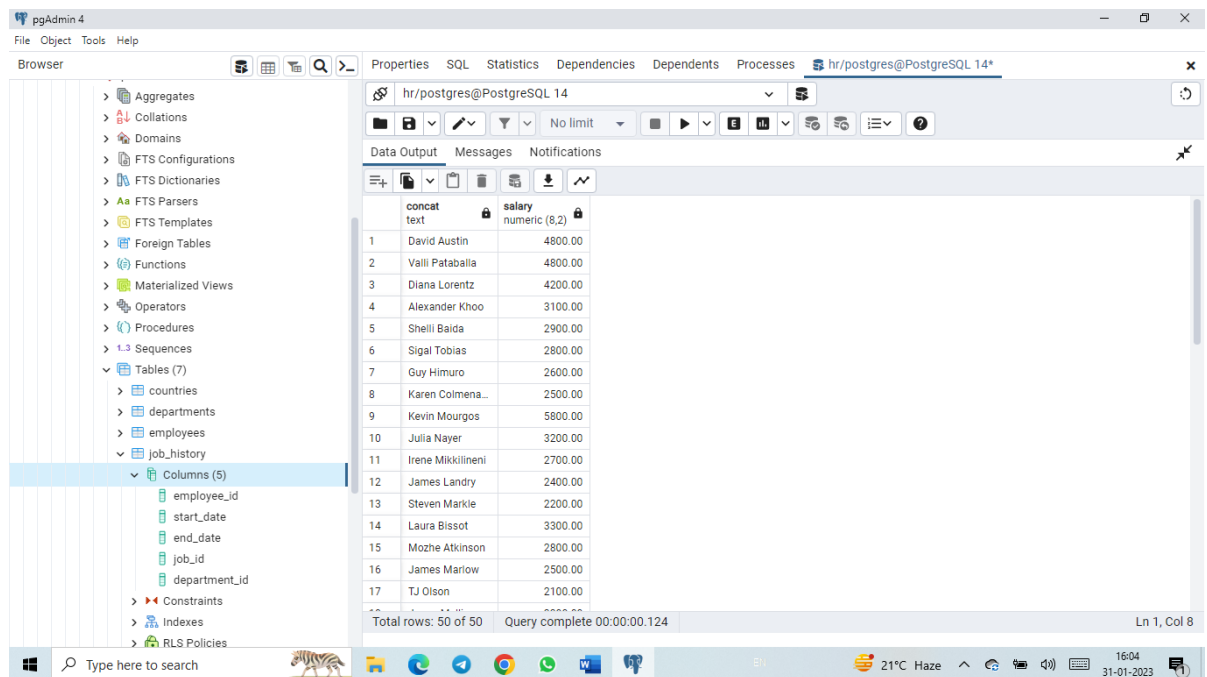
## ER DIAGRAM



# QUERIES

- a. write a SQL query to find those employees whose salaries are less than 6000. Return full name (first and last name), and salary.

Solution - `SELECT CONCAT(first_name,' ',last_name),salary FROM employees WHERE salary<6000;`

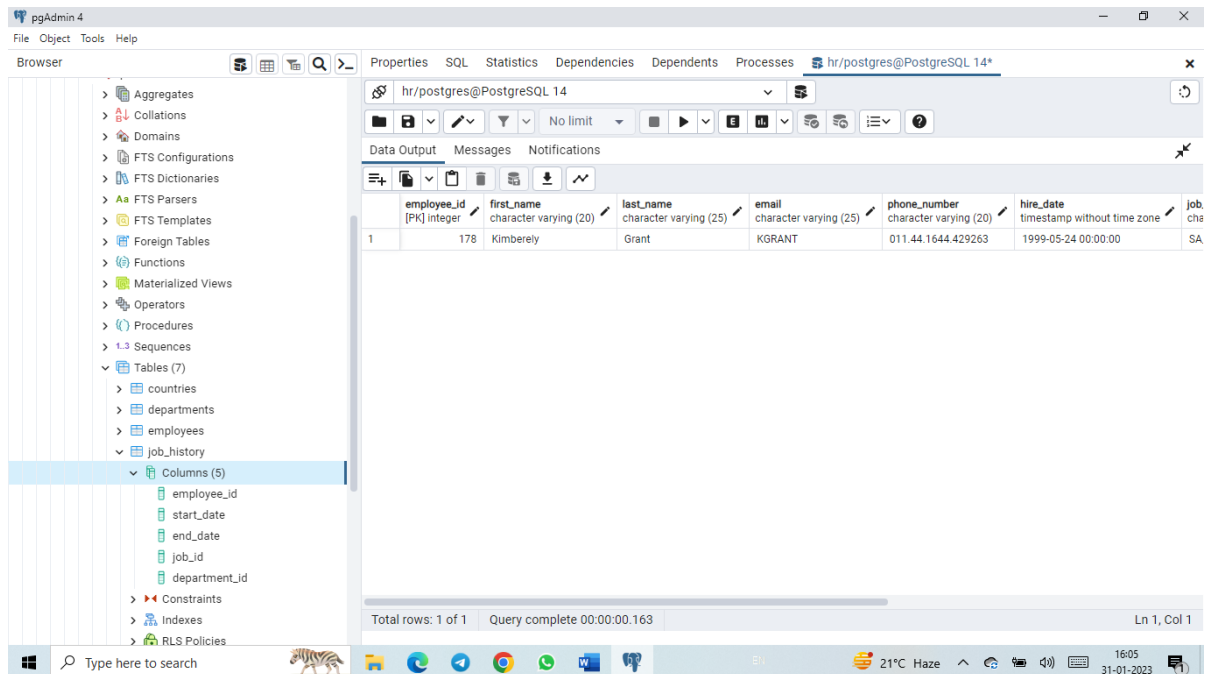


	concat text	salary numeric (8,2)
1	David Austin	4800.00
2	Valli Pataballa	4800.00
3	Diana Lorentz	4200.00
4	Alexander Khoo	3100.00
5	Shelli Baida	2900.00
6	Sigal Tobias	2800.00
7	Guy Himuro	2600.00
8	Karen Colmena...	2500.00
9	Kevin Mourgos	5800.00
10	Julia Nayer	3200.00
11	Irene Mikkilineni	2700.00
12	James Landry	2400.00
13	Steven Markie	2200.00
14	Laura Bissot	3300.00
15	Mozhe Atkinson	2800.00
16	James Mariow	2500.00
17	TJ Olson	2100.00

Total rows: 50 of 50    Query complete 00:00:00.124    Ln 1, Col 8

- b. write a SQL query to identify employees who do not have a department number. Return employee\_id, first\_name, last\_name, email, phone\_number, hire\_date, job\_id, salary, commission\_pct, manager\_id and department\_id

solution - SELECT \* FROM employees WHERE department\_id IS NULL;

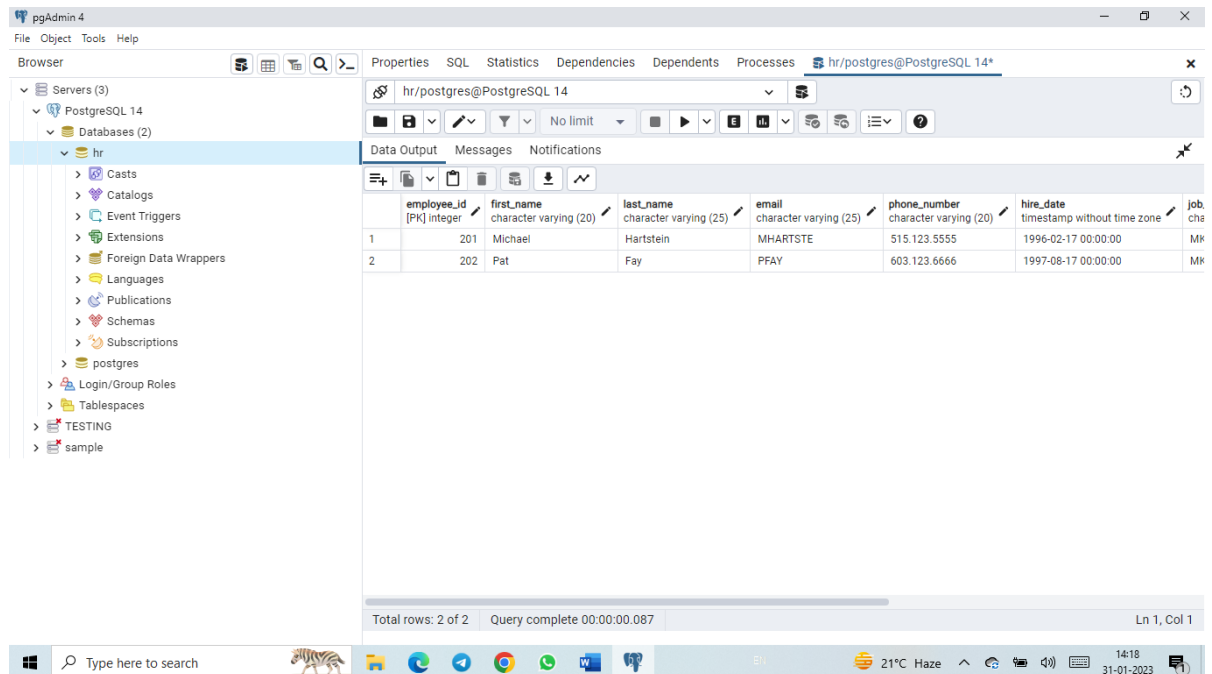


The screenshot shows the pgAdmin 4 interface. On the left, the 'Browser' pane displays the database structure, with 'Tables (7)' expanded to show 'employees'. The 'Columns (5)' for 'employees' are listed: employee\_id, first\_name, last\_name, email, and phone\_number. The main pane shows the 'Data Output' tab with a single row of data for the employee with employee\_id 178. The status bar at the bottom indicates 'Total rows: 1 of 1' and 'Query complete 00:00:00.163'.

employee_id	first_name	last_name	email	phone_number	hire_date	job_id
178	Kimberely	Grant	KGRANT	011.44.1644.429263	1999-05-24 00:00:00	SA

- c. write a SQL query to find the details of 'Marketing' department. Return all fields

solution - `SELECT * FROM employees WHERE department_id IN (SELECT department_id FROM departments WHERE department_name = 'Marketing');`



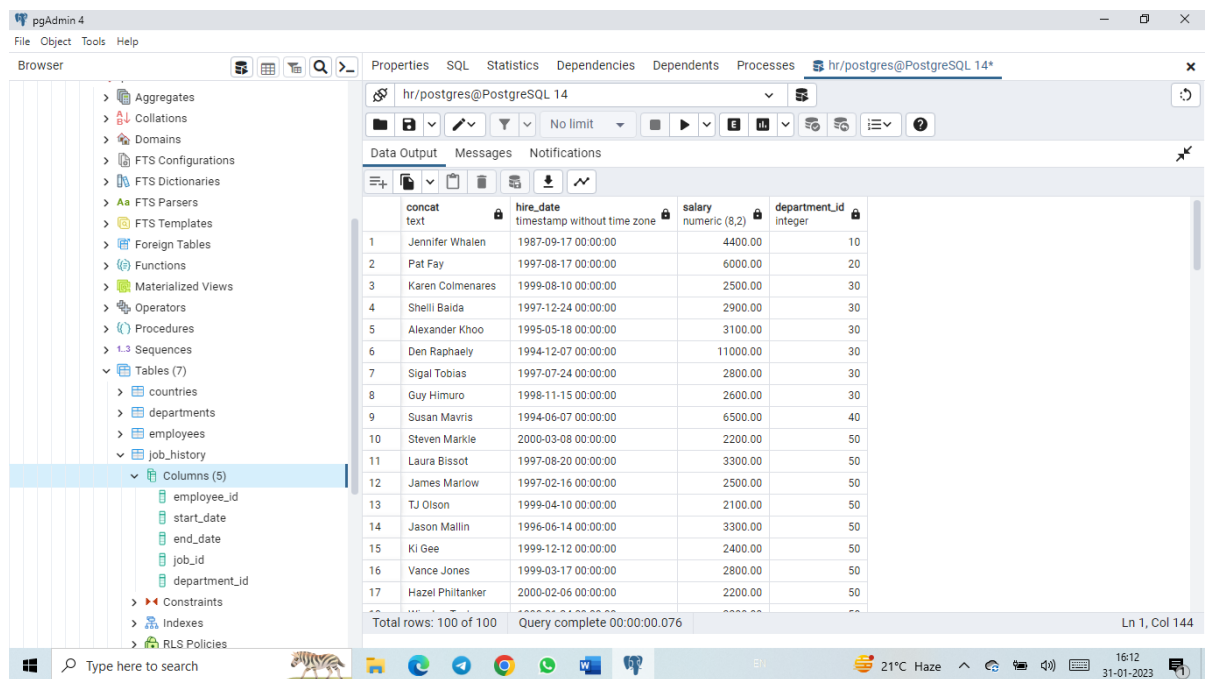
The screenshot shows the pgAdmin 4 interface. The left sidebar displays the database structure, with the 'hr' database selected. The main pane shows the 'Data Output' tab for a query executed on the 'hr/postgres@PostgreSQL 14\*' connection. The query result is displayed as a table with 7 columns: employee\_id, first\_name, last\_name, email, phone\_number, hire\_date, and job\_id. Two rows of data are shown, representing employees in the Marketing department.

	employee_id	first_name	last_name	email	phone_number	hire_date	job_id
1	201	Michael	Hartstein	MHARTSTE	515.123.5555	1996-02-17 00:00:00	MR
2	202	Pat	Fay	PFAY	603.123.6666	1997-08-17 00:00:00	MR

Total rows: 2 of 2    Query complete 00:00:00.087    Ln 1, Col 1

- d. write a SQL query to find those employees whose first name does not contain the letter 'M'. Sort the result-set in ascending order by department ID. Return full name (first and last name together), hire\_date, salary and department\_id

solution - SELECT CONCAT(first\_name,' ', last\_name) , hire\_date , salary , department\_id FROM employees WHERE first\_name NOT LIKE '%M%' ORDER BY department\_id;



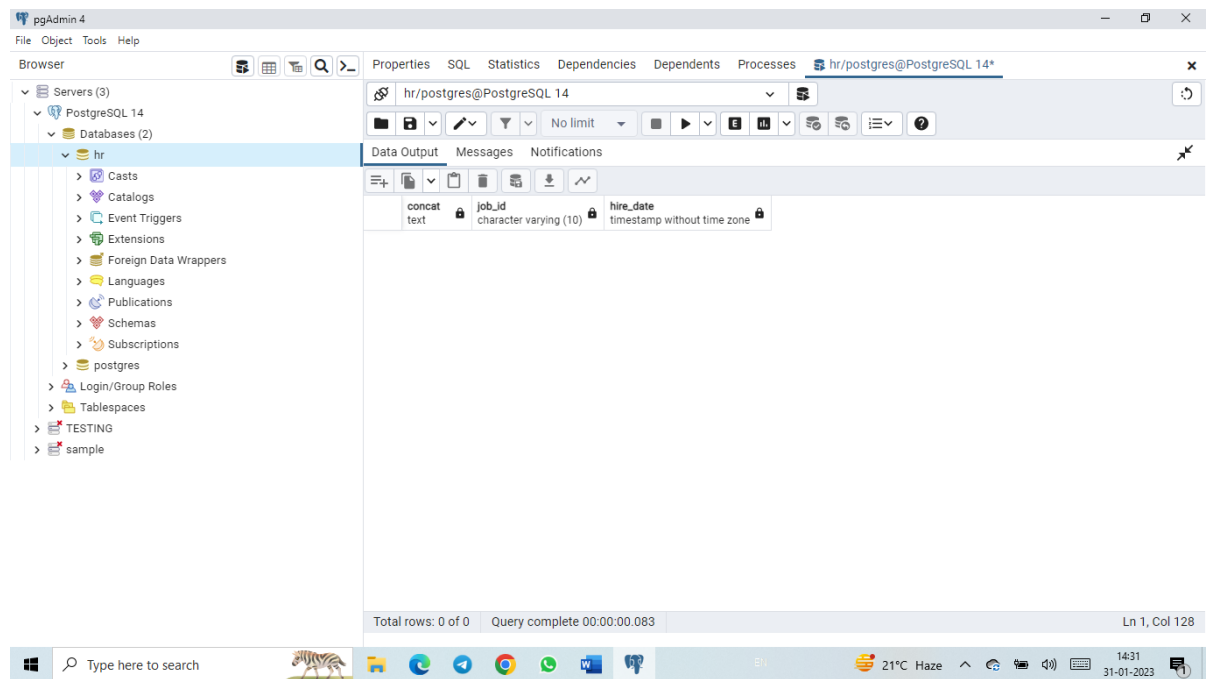
The screenshot shows the pgAdmin 4 interface with a SQL query executed. The query is: `SELECT CONCAT(first_name,' ', last_name) , hire_date , salary , department_id FROM employees WHERE first_name NOT LIKE '%M%' ORDER BY department_id;` The result set displays 17 rows of employee data, sorted by department\_id. The columns are: concat (text), hire\_date (timestamp without time zone), salary (numeric (8,2)), and department\_id (integer).

	concat	hire_date	salary	department_id
1	Jennifer Whalen	1987-09-17 00:00:00	4400.00	10
2	Pat Fay	1997-08-17 00:00:00	6000.00	20
3	Karen Colmenares	1999-08-10 00:00:00	2500.00	30
4	Shelli Baida	1997-12-24 00:00:00	2900.00	30
5	Alexander Khoo	1995-05-18 00:00:00	3100.00	30
6	Den Raphaely	1994-12-07 00:00:00	11000.00	30
7	Sigal Tobias	1997-07-24 00:00:00	2800.00	30
8	Guy Himuro	1998-11-15 00:00:00	2600.00	30
9	Susan Mavris	1994-06-07 00:00:00	6500.00	40
10	Steven Markle	2000-03-08 00:00:00	2200.00	50
11	Laura Bissot	1997-08-20 00:00:00	3300.00	50
12	James Marlow	1997-02-16 00:00:00	2500.00	50
13	TJ Olson	1999-04-10 00:00:00	2100.00	50
14	Jason Mallin	1996-06-14 00:00:00	3300.00	50
15	Ki Gee	1999-12-12 00:00:00	2400.00	50
16	Vance Jones	1999-03-17 00:00:00	2800.00	50
17	Hazel Phitanker	2000-02-06 00:00:00	2200.00	50

Total rows: 100 of 100 Query complete 00:00:00.076 Ln 1, Col 144

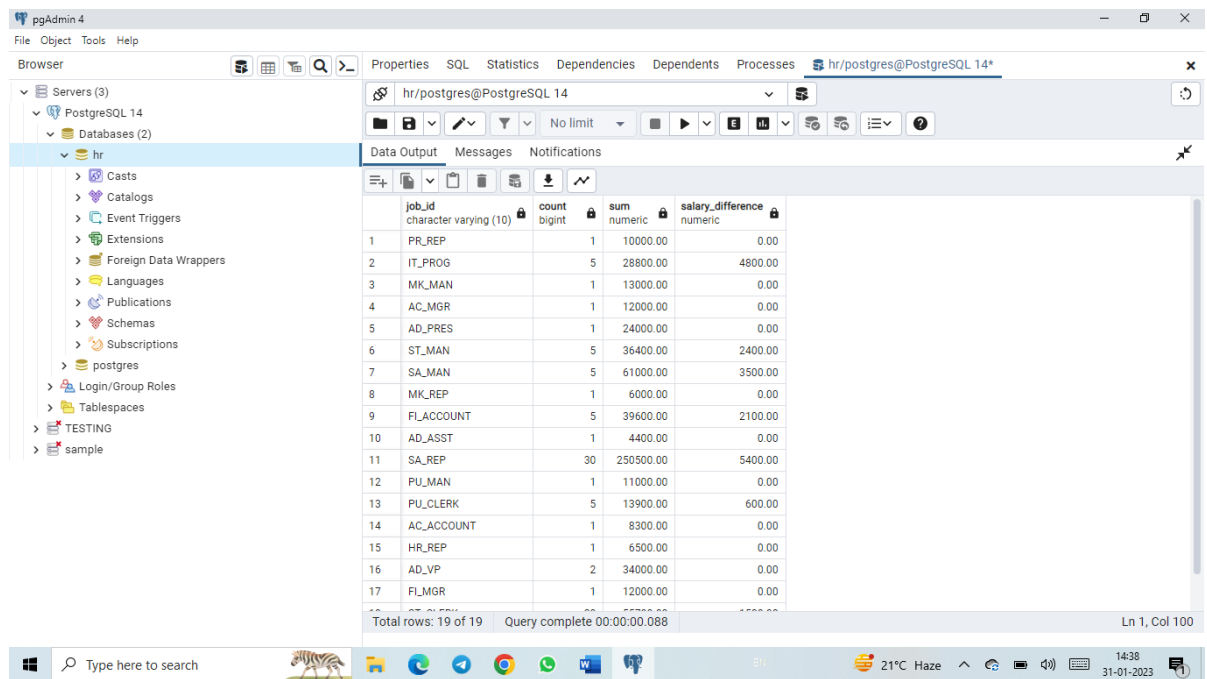
- e. write a SQL query to find those employees who were hired between November 5th, 2007 and July 5th, 2009. Return full name (first and last), job id and hire date

solution - `SELECT CONCAT(first_name,' ',last_name),job_id,hire_date FROM employees WHERE hire_date BETWEEN DATE '2007-11-05'AND DATE '2009-07-05';`



- f. write a SQL query to count the number of employees, the sum of all salary, and difference between the highest salary and lowest salaries by each job id. Return job\_id, count, sum, salary\_difference.

Solution – SELECT DISTINCT (job\_id) , COUNT (employee\_id) , SUM(salary) , MAX(salary)-MIN(salary) AS salary\_difference FROM employees GROUP BY job\_id;

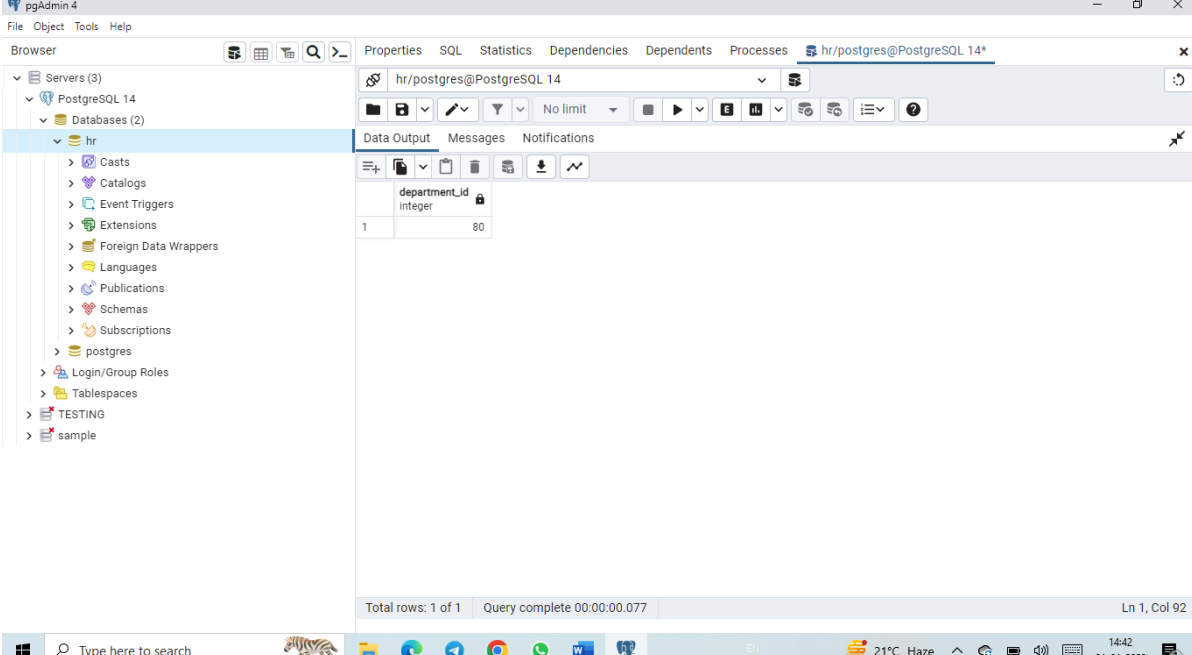


	job_id	count	sum	salary_difference
	character varying (10)	bigint	numeric	numeric
1	PR_REP	1	10000.00	0.00
2	IT_PROG	5	28800.00	4800.00
3	MK_MAN	1	13000.00	0.00
4	AC_MGR	1	12000.00	0.00
5	AD_PRES	1	24000.00	0.00
6	ST_MAN	5	36400.00	2400.00
7	SA_MAN	5	61000.00	3500.00
8	MK_REP	1	6000.00	0.00
9	FL_ACCOUNT	5	39600.00	2100.00
10	AD_ASST	1	4400.00	0.00
11	SA_REP	30	250500.00	5400.00
12	PU_MAN	1	11000.00	0.00
13	PU_CLERK	5	13900.00	600.00
14	AC_ACCOUNT	1	8300.00	0.00
15	HR_REP	1	6500.00	0.00
16	AD_VP	2	34000.00	0.00
17	FL_MGR	1	12000.00	0.00

Total rows: 19 of 19    Query complete 00:00:00.088    Ln 1, Col 100

- g. write a SQL query to find the departments where more than ten employees receive commissions. Return department id

solution - SELECT department\_id FROM employees GROUP BY department\_id HAVING COUNT(commission\_pct)>10;



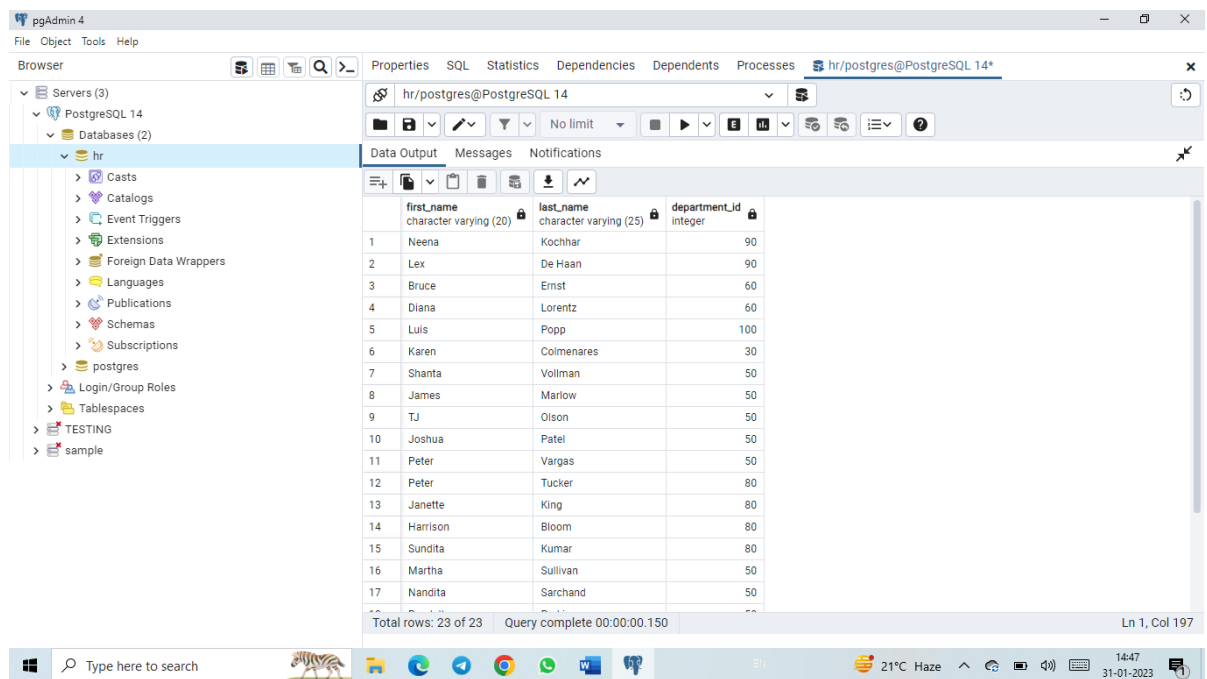
The screenshot shows the pgAdmin 4 interface. On the left, the 'Browser' pane displays a tree view of the database structure, with 'hr' selected under 'Databases (2)'. The main pane shows the 'Data Output' tab for the query 'hr/postgres@PostgreSQL 14'. The query result is displayed as a table with one column, 'department\_id', and one row with the value '80'. The status bar at the bottom indicates 'Total rows: 1 of 1' and 'Query complete 00:00:00.077'.

department_id
80



- h. write a SQL query to find those employees whose salary matches the lowest salary of any of the departments. Return first name, last name and department ID

solution - SELECT first\_name,last\_name,department\_id FROM employees WHERE salary in (SELECT MIN(e.salary) FROM employees AS e JOIN departments AS d ON d.department\_id=e.department\_id GROUP BY department\_name);

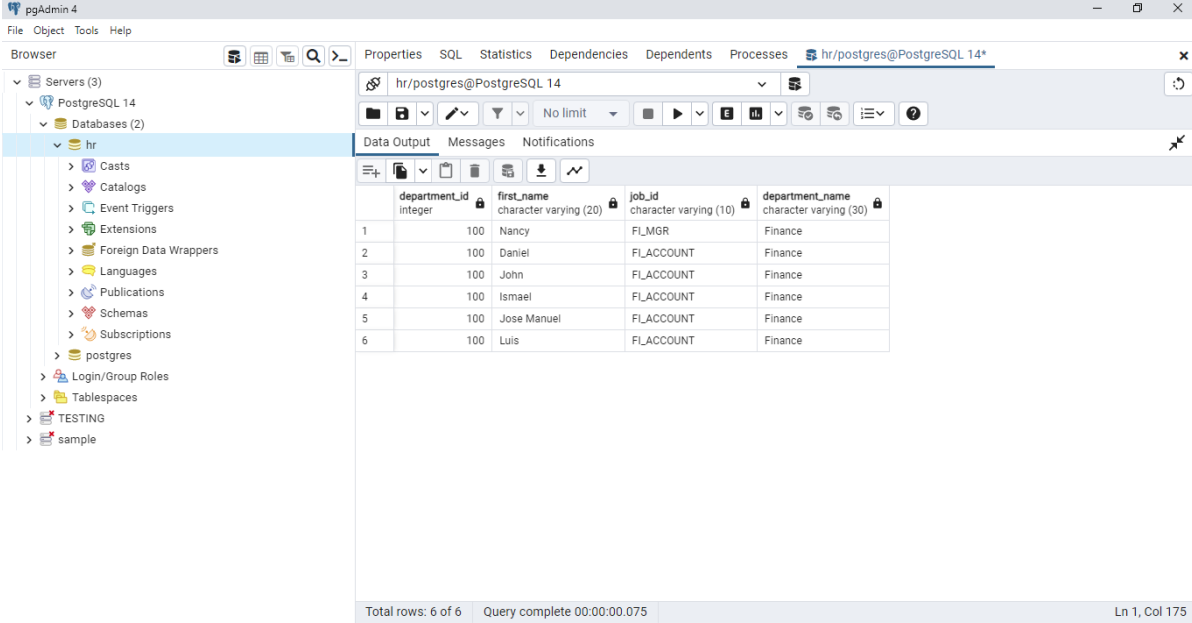


	first_name character varying (20)	last_name character varying (25)	department_id integer
1	Neena	Kochhar	90
2	Lex	De Haan	90
3	Bruce	Ernst	60
4	Diana	Lorentz	60
5	Luis	Popp	100
6	Karen	Colmenares	30
7	Shanta	Vollman	50
8	James	Marlow	50
9	TJ	Olson	50
10	Joshua	Patel	50
11	Peter	Vargas	50
12	Peter	Tucker	80
13	Janette	King	80
14	Harrison	Bloom	80
15	Sundita	Kumar	80
16	Martha	Sullivan	50
17	Nandita	Sarchand	50

Total rows: 23 of 23    Query complete 00:00:00.150    Ln 1, Col 197

- i. write a SQL query to find all those employees who work in the Finance department. Return department ID, name (first), job ID and department name

solution – SELECT e.department\_id , e.first\_name , e.job\_id ,  
d.department\_name FROM employees AS e JOIN departments AS d ON  
e.department\_id=d.department\_id WHERE d.department\_name='Finance';



The screenshot shows the pgAdmin 4 interface. On the left, the 'Servers' tree is expanded to show the 'hr' database. The main pane displays the 'Data Output' tab for a query executed on the 'hr/postgres@PostgreSQL 14' connection. The query result is a table with 6 rows and 4 columns: department\_id, first\_name, job\_id, and department\_name. The data shows employees Nancy, Daniel, John, Ismael, Jose Manuel, and Luis, all working in the Finance department. The status bar at the bottom indicates 'Total rows: 6 of 6' and 'Query complete 00:00:00.075'.

	department_id	first_name	job_id	department_name
1	100	Nancy	FI_MGR	Finance
2	100	Daniel	FI_ACCOUNT	Finance
3	100	John	FI_ACCOUNT	Finance
4	100	Ismael	FI_ACCOUNT	Finance
5	100	Jose Manuel	FI_ACCOUNT	Finance
6	100	Luis	FI_ACCOUNT	Finance

- j. write a SQL query to find those employees who get second-highest salary. Return all the fields of the employees

solution - `SELECT * FROM employees WHERE salary=(SELECT DISTINCT(salary) FROM employees ORDER BY salary DESC OFFSET 1 LIMIT 1);`

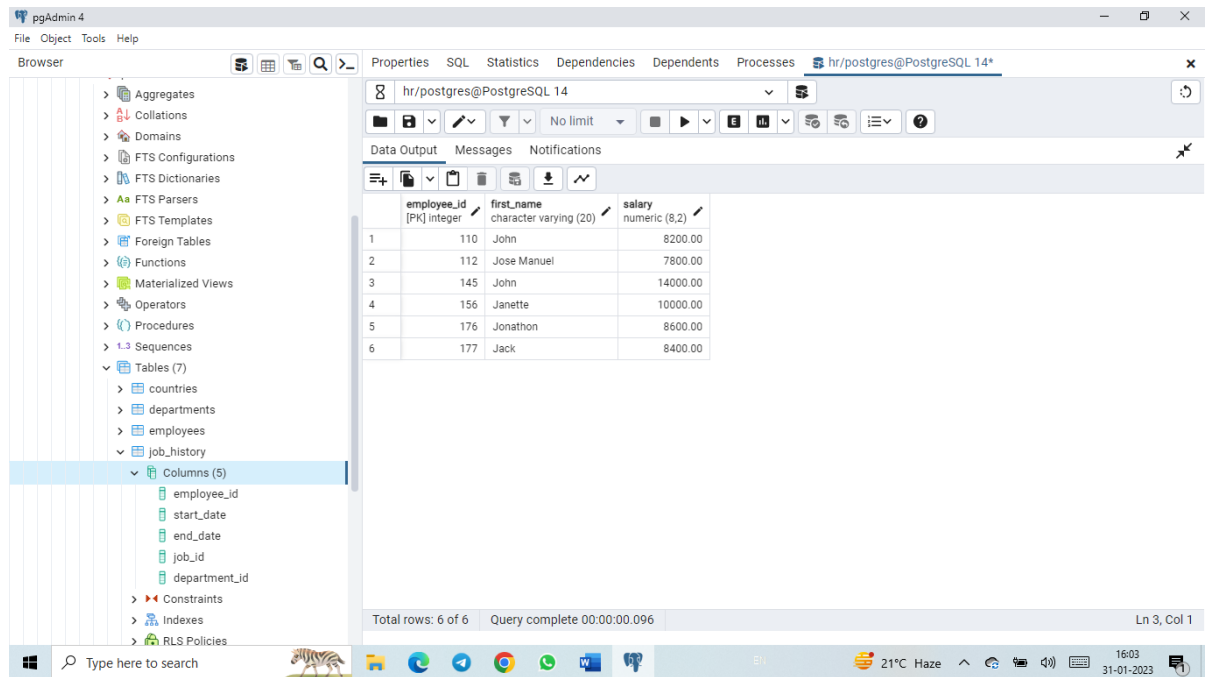
The screenshot shows the pgAdmin 4 interface. On the left, the 'hr' database is selected under 'PostgreSQL 14'. The 'Data Output' tab is active, displaying the following table:

	employee_id	first_name	last_name	email	phone_number	hire_date	job
1	101	Neena	Kochhar	NKOCHHAR	515.123.4568	1989-09-21 00:00:00	AD
2	102	Lex	De Haan	LDEHAAN	515.123.4569	1993-01-13 00:00:00	AD

At the bottom, the status bar indicates 'Total rows: 2 of 2' and 'Query complete 00:00:00.091'. The system tray at the very bottom shows the date and time as '15:00 31-01-2023'.

- k. write a SQL query to find those employees who earn more than the average salary and work in the same department as an employee whose first name contains the letter 'J'. Return employee ID, first name and salary

solution - `SELECT employee_id,first_name,salary FROM employees WHERE salary>(SELECT AVG(salary) FROM employees) AND department_id IN (SELECT department_id FROM departments GROUP BY department_id) AND first_name LIKE '%J%';`

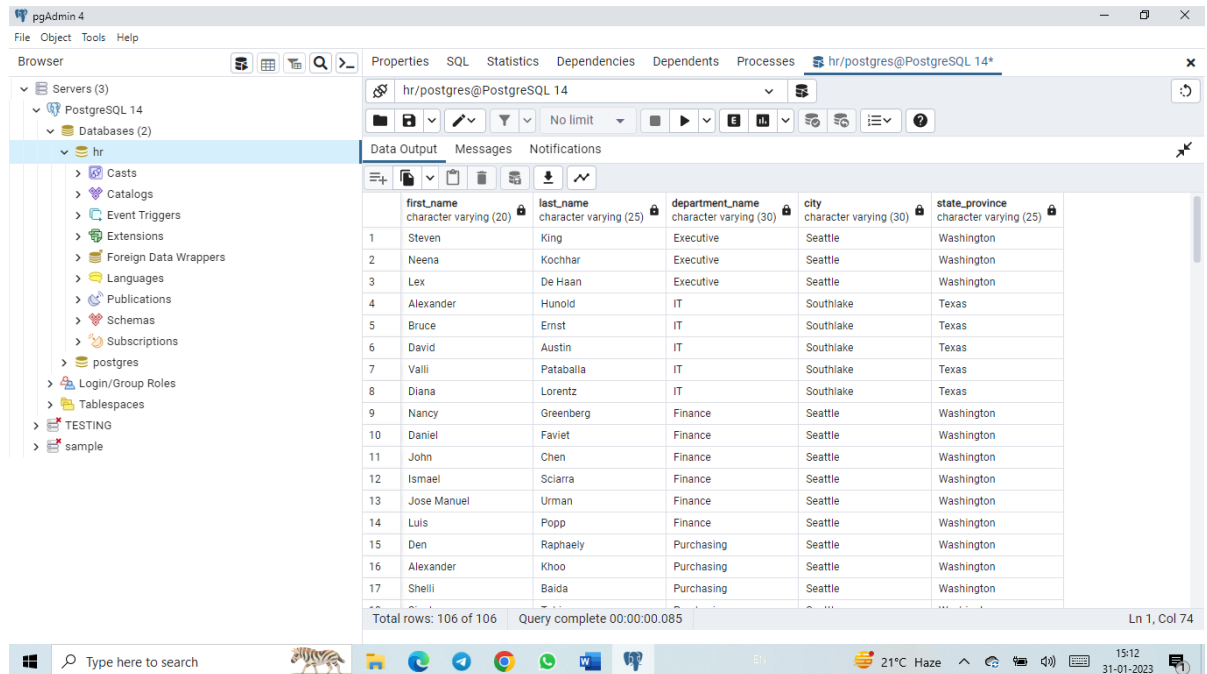


The screenshot shows the pgAdmin 4 interface. On the left, the 'Browser' pane displays the database structure, with 'Tables (7)' expanded and 'employees' selected. The 'Columns (5)' for the 'employees' table are listed: employee\_id, start\_date, end\_date, job\_id, and department\_id. The main pane shows the 'Data Output' tab with the results of a SQL query. The query is: `SELECT employee_id,first_name,salary FROM employees WHERE salary>(SELECT AVG(salary) FROM employees) AND department_id IN (SELECT department_id FROM departments GROUP BY department_id) AND first_name LIKE '%J%';` The results are displayed in a table with 6 rows and 3 columns: employee\_id, first\_name, and salary. The status bar at the bottom indicates 'Total rows: 6 of 6' and 'Query complete 00:00:00.096'.

employee_id	first_name	salary
1	John	8200.00
2	Jose Manuel	7800.00
3	John	14000.00
4	Janette	10000.00
5	Jonathon	8600.00
6	Jack	8400.00

- I. write a SQL query to find the first name, last name, department, city, and state province for each employee

solution - SELECT e.first\_name , e.last\_name , d.department\_name , l.city , l.state\_province FROM employees AS e JOIN departments AS d ON e.department\_id = d.department\_id JOIN locations as l ON l.location\_id = d.location\_id;



pgAdmin 4

File Object Tools Help

Browser

PostgreSQL 14

Databases (2)

hr

postgres

TESTING

sample

hr/postgres@PostgreSQL 14\*

hr/postgres@PostgreSQL 14

No limit

Data Output Messages Notifications

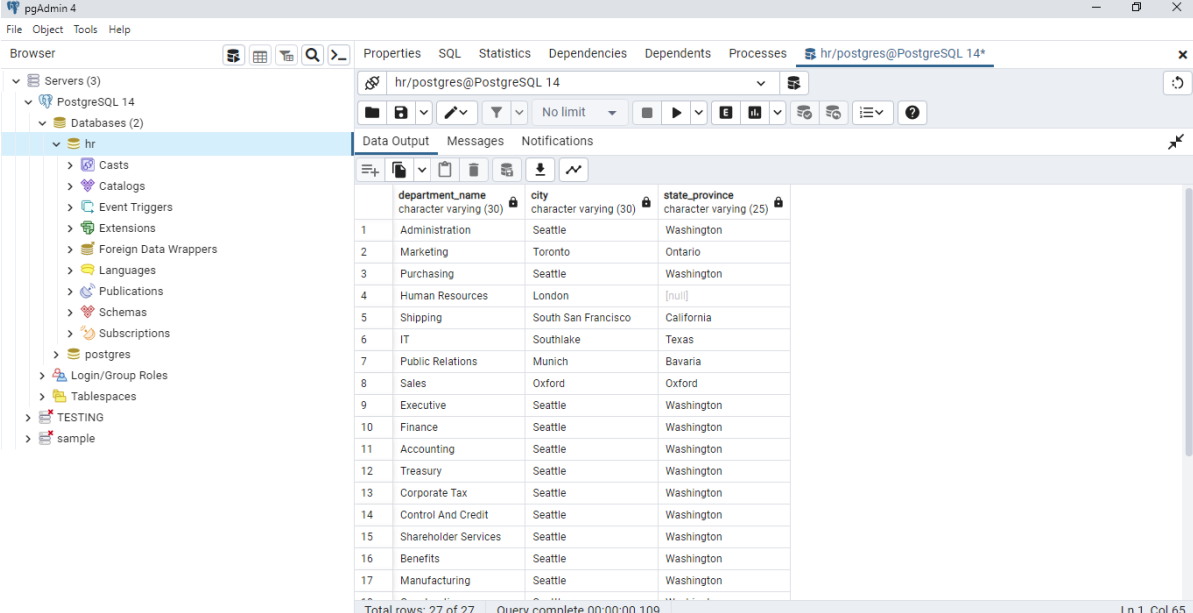
	first_name character varying (20)	last_name character varying (25)	department_name character varying (30)	city character varying (30)	state_province character varying (25)
1	Steven	King	Executive	Seattle	Washington
2	Neena	Kochhar	Executive	Seattle	Washington
3	Lex	De Haan	Executive	Seattle	Washington
4	Alexander	Hunold	IT	Southlake	Texas
5	Bruce	Ernst	IT	Southlake	Texas
6	David	Austin	IT	Southlake	Texas
7	Valli	Pataballa	IT	Southlake	Texas
8	Diana	Lorentz	IT	Southlake	Texas
9	Nancy	Greenberg	Finance	Seattle	Washington
10	Daniel	Faviet	Finance	Seattle	Washington
11	John	Chen	Finance	Seattle	Washington
12	Ismael	Sciarra	Finance	Seattle	Washington
13	Jose Manuel	Urman	Finance	Seattle	Washington
14	Luis	Popp	Finance	Seattle	Washington
15	Den	Raphaely	Purchasing	Seattle	Washington
16	Alexander	Khoo	Purchasing	Seattle	Washington
17	Shelli	Baida	Purchasing	Seattle	Washington

Total rows: 106 of 106 Query complete 00:00:00.085 Ln 1, Col 74

21°C Haze 15:12 31-01-2023

m. write a SQL query to display the department name, city, and state province for each department

solution - SELECT d.department\_name,l.city,l.state\_province FROM departments AS d JOIN locations as l ON l.location\_id=d.location\_id;



pgAdmin 4

File Object Tools Help

Browser

Servers (3)

- PostgreSQL 14
  - Databases (2)
    - hr
      - Cast
      - Catalogs
      - Event Triggers
      - Extensions
      - Foreign Data Wrappers
      - Languages
      - Publications
      - Schemas
      - Subscriptions
      - postgres
      - Login/Group Roles
      - Tablespaces
      - TESTING
      - sample

hr/postgres@PostgreSQL 14\*

Properties SQL Statistics Dependencies Dependents Processes

hr/postgres@PostgreSQL 14

No limit

Data Output Messages Notifications

	department_name character varying (30)	city character varying (30)	state_province character varying (25)
1	Administration	Seattle	Washington
2	Marketing	Toronto	Ontario
3	Purchasing	Seattle	Washington
4	Human Resources	London	[null]
5	Shipping	South San Francisco	California
6	IT	Southlake	Texas
7	Public Relations	Munich	Bavaria
8	Sales	Oxford	Oxford
9	Executive	Seattle	Washington
10	Finance	Seattle	Washington
11	Accounting	Seattle	Washington
12	Treasury	Seattle	Washington
13	Corporate Tax	Seattle	Washington
14	Control And Credit	Seattle	Washington
15	Shareholder Services	Seattle	Washington
16	Benefits	Seattle	Washington
17	Manufacturing	Seattle	Washington

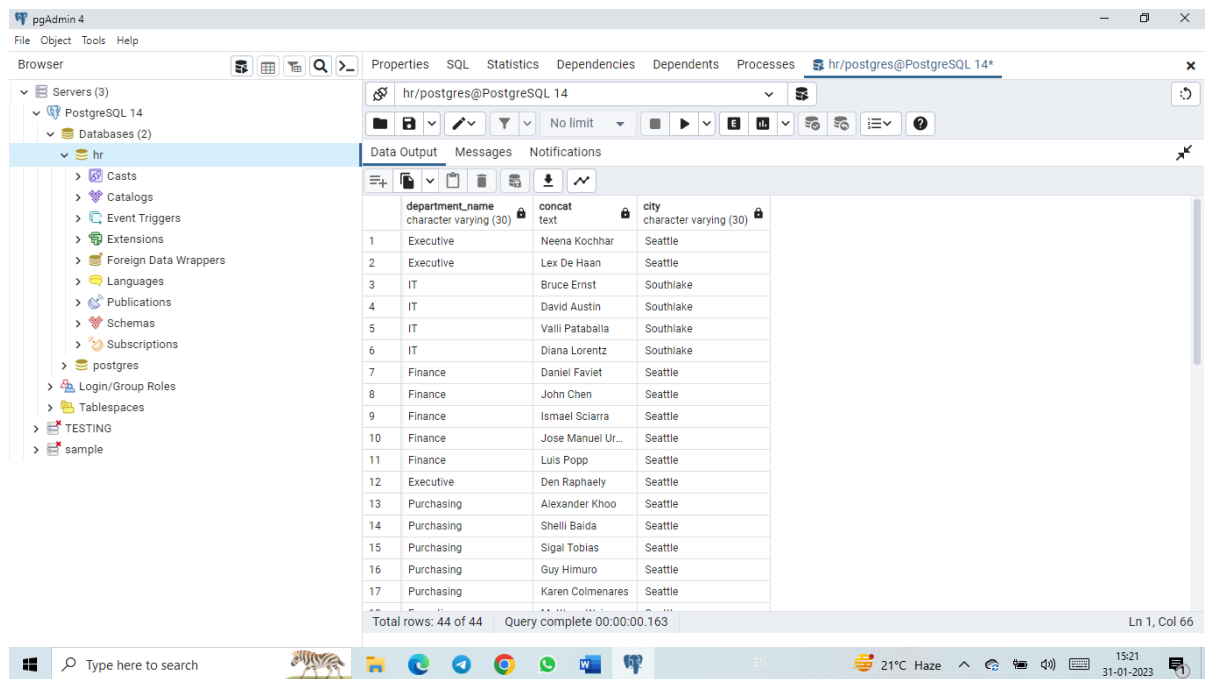
Total rows: 27 of 27 Query complete 00:00:00.109 Ln 1, Col 65

Type here to search

21°C Haze 15:14 31-01-2023

- n. write a SQL query to find the department name, full name (first and last name) of the manager and their city

solution - `SELECT d.department_name, CONCAT(first_name, 'last_name'), l.city FROM employees AS e JOIN departments AS d ON e.manager_id=d.manager_id JOIN locations as l ON l.location_id = d.location_id;`

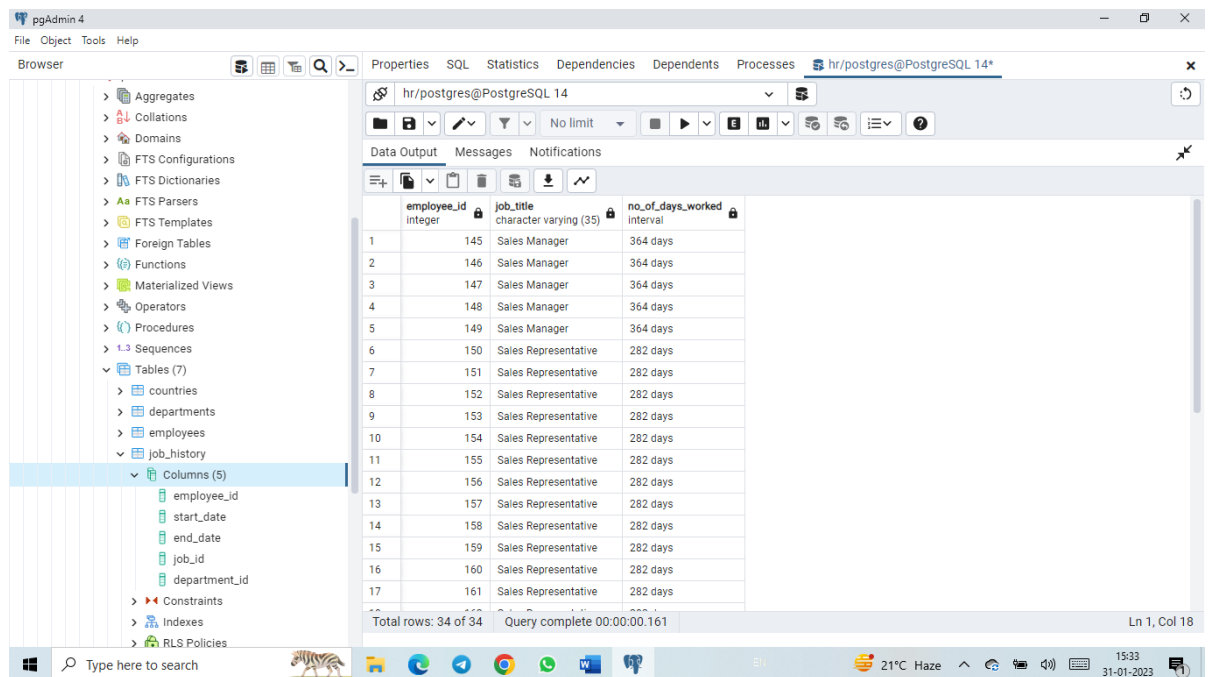


	department_name character varying (30)	concat text	city character varying (30)
1	Executive	Neena Kochhar	Seattle
2	Executive	Lex De Haan	Seattle
3	IT	Bruce Ernst	Southlake
4	IT	David Austin	Southlake
5	IT	Valli Pataballa	Southlake
6	IT	Diana Lorentz	Southlake
7	Finance	Daniel Faviet	Seattle
8	Finance	John Chen	Seattle
9	Finance	Ismael Sciarra	Seattle
10	Finance	Jose Manuel Ur...	Seattle
11	Finance	Luis Popp	Seattle
12	Executive	Den Raphaely	Seattle
13	Purchasing	Alexander Khoo	Seattle
14	Purchasing	Shelli Baida	Seattle
15	Purchasing	Sigal Tobias	Seattle
16	Purchasing	Guy Himuro	Seattle
17	Purchasing	Karen Colmenares	Seattle

Total rows: 44 of 44    Query complete 00:00:00.163    Ln 1, Col 66

- o. write a SQL query to calculate the number of days worked by employees in a department of ID 80. Return employee ID, job title, number of days worked

Solution - SELECT e.employee\_id,j.job\_title,jh.end\_date-jh.start\_date AS no\_of\_days\_worked FROM employees AS e JOIN jobs AS j ON e.job\_id = j.job\_id JOIN job\_history AS jh ON j.job\_id=jh.job\_id WHERE e.department\_id=80;



pgAdmin 4

File Object Tools Help

Browser

hr/postgres@PostgreSQL 14\*

hr/postgres@PostgreSQL 14

No limit

Data Output Messages Notifications

employee_id	job_title	no_of_days_worked
1	145 Sales Manager	364 days
2	146 Sales Manager	364 days
3	147 Sales Manager	364 days
4	148 Sales Manager	364 days
5	149 Sales Manager	364 days
6	150 Sales Representative	282 days
7	151 Sales Representative	282 days
8	152 Sales Representative	282 days
9	153 Sales Representative	282 days
10	154 Sales Representative	282 days
11	155 Sales Representative	282 days
12	156 Sales Representative	282 days
13	157 Sales Representative	282 days
14	158 Sales Representative	282 days
15	159 Sales Representative	282 days
16	160 Sales Representative	282 days
17	161 Sales Representative	282 days

Total rows: 34 of 34 Query complete 00:00:00.161 Ln 1, Col 18

Type here to search

21°C Haze 15:33 31-01-2023