Course	:	BIC 21404 Database
Session	:	II 2024/2025
Lab task	:	7
Lab Topic	:	Using JOIN
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Instructions: answer all questions

Write a summary (300 words) on the lesson learned, difficulties arise or any new knowledge obtained throughout the Lab 6 Exercise.

Lesson learned in Lab 7:

1. Execute the following statement and show the output.

SQL statement	Output	No of records
SELECT department_id, department_name, location_id, city FROM departments NATURAL JOIN locations;	<table><tr><td>department_id</td><td>department_name</td><td>location_id</td><td>city</td></tr><tr><td>10</td><td>Administration</td><td>1700</td><td>Seattle</td></tr><tr><td>20</td><td>Marketing</td><td>1800</td><td>Toronto</td></tr><tr><td>30</td><td>Purchasing</td><td>1700</td><td>Seattle</td></tr><tr><td>40</td><td>Human Resources</td><td>2400</td><td>London</td></tr><tr><td>50</td><td>Shipping</td><td>1500</td><td>South San Francisco</td></tr><tr><td>60</td><td>IT</td><td>1400</td><td>Southlake</td></tr><tr><td>70</td><td>Public Relations</td><td>2700</td><td>Munich</td></tr><tr><td>80</td><td>Sales</td><td>2500</td><td>Oxford</td></tr><tr><td>90</td><td>Executive</td><td>1700</td><td>Seattle</td></tr><tr><td>100</td><td>Finance</td><td>1700</td><td>Seattle</td></tr><tr><td>110</td><td>Accounting</td><td>1700</td><td>Seattle</td></tr><tr><td>120</td><td>Treasury</td><td>1700</td><td>Seattle</td></tr><tr><td>130</td><td>Corporate Tax</td><td>1700</td><td>Seattle</td></tr><tr><td>140</td><td>Control And Credit</td><td>1700</td><td>Seattle</td></tr><tr><td>150</td><td>Shareholder Services</td><td>1700</td><td>Seattle</td></tr><tr><td>160</td><td>Benefits</td><td>1700</td><td>Seattle</td></tr><tr><td>170</td><td>Manufacturing</td><td>1700</td><td>Seattle</td></tr><tr><td>180</td><td>Construction</td><td>1700</td><td>Seattle</td></tr><tr><td>190</td><td>Contracting</td><td>1700</td><td>Seattle</td></tr><tr><td>200</td><td>Operations</td><td>1700</td><td>Seattle</td></tr><tr><td>210</td><td>IT Support</td><td>1700</td><td>Seattle</td></tr><tr><td>220</td><td>NOC</td><td>1700</td><td>Seattle</td></tr><tr><td>230</td><td>IT Helpdesk</td><td>1700</td><td>Seattle</td></tr><tr><td>240</td><td>Government Sales</td><td>1700</td><td>Seattle</td></tr><tr><td>250</td><td>Retail Sales</td><td>1700</td><td>Seattle</td></tr></table>	27
SELECT department_id, department_name, location_id, city FROM departments NATURAL JOIN locations WHERE department_id IN (20, 50);	<table><tr><td>department_id</td><td>department_name</td><td>location_id</td><td>city</td></tr><tr><td>20</td><td>Marketing</td><td>1800</td><td>Toronto</td></tr><tr><td>50</td><td>Shipping</td><td>1500</td><td>South San Francisco</td></tr></table>	2
SELECT * FROM employees CROSS JOIN departments		107

`SELECT * FROM departments cross JOIN jobs`		
`SELECT * FROM locations cross JOIN regions`		513
`SELECT last_name, department_name FROM employees e, departments d WHERE e.department_id = d.department_id`		106

```SELECT last_name, job_title FROM employees e, jobs j WHERE e.job_id = j.job_id```		107
```SELECT e. last_name, e. department_id, d. department_name FROM employees e LEFT OUTER JOIN departments d ON (e.department_id = d.department_id) ;```		107

```
SELECT
e.last_name,
e.department_id
,
d.department_na
me
FROM
employees e
RIGHT OUTER
JOIN
departments d
ON
(e.department_i
d =
d.department_id
) ;
```

last_name	department_id	department_name
Whalen	10	Administration
Harstein	20	Marketing
Fay	20	Marketing
Raphaely	30	Purchasing
Khoo	30	Purchasing
Baida	30	Purchasing
Tobias	30	Purchasing
Himuro	30	Purchasing
Colmenares	30	Purchasing
Mavris	40	Human Resources
Weiss	50	Shipping
Fripp	50	Shipping
Kaufling	50	Shipping
Vollman	50	Shipping
Mourgos	50	Shipping
Nayer	50	Shipping
Mikkilineni	50	Shipping
Landry	50	Shipping
Markle	50	Shipping
Bissot	50	Shipping
Atkinson	50	Shipping
Marlow	50	Shipping
Olson	50	Shipping
Mallin	50	Shipping
Rogers	50	Shipping

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SELECT e.last_name, e.department_id, d.department_name FROM employees e LEFT JOIN departments d ON (e.department_id = d.department_id) ;			107

last_name	department_id	department_name
King	90	Executive
Kochhar	90	Executive
De Haan	90	Executive
Hunold	60	IT
Ernst	60	IT
Austin	60	IT
Pataballa	60	IT
Lorentz	60	IT
Greenberg	100	Finance
Faviet	100	Finance
Chen	100	Finance
Sciarra	100	Finance
Urman	100	Finance
Popp	100	Finance
Raphaely	30	Purchasing
Khoo	30	Purchasing
Baida	30	Purchasing
Tobias	30	Purchasing
Himuro	30	Purchasing
Colmenares	30	Purchasing
Weiss	50	Shipping
Fripp	50	Shipping
Kaufling	50	Shipping
Vollman	50	Shipping
Mourgos	50	Shipping

``SELECT
e.last_name,
e.department_id
,
d.department_na
me
FROM
employees e
RIGHT JOIN
departments d
ON
(e.department_i
d =
d.department_id
) ;```		122

last_name	department_id	department_name
Whalen	10	Administration
Harstein	20	Marketing
Fay	20	Marketing
Raphaely	30	Purchasing
Khoo	30	Purchasing
Baida	30	Purchasing
Tobias	30	Purchasing
Himuro	30	Purchasing
Colmenares	30	Purchasing
Mavris	40	Human Resources
Weiss	50	Shipping
Fripp	50	Shipping
Kaufling	50	Shipping
Vollman	50	Shipping
Mourgos	50	Shipping
Nayer	50	Shipping
Mikkilineni	50	Shipping
Landry	50	Shipping
Markle	50	Shipping
Bissot	50	Shipping
Atkinson	50	Shipping
Marlow	50	Shipping
Olson	50	Shipping
Mallin	50	Shipping
Rogers	50	Shipping

2. Write a query for HR department to produce the addresses of all the departments. Use the LOCATIONS and COUNTRIES tables. Show the location ID, street address, city, state or province, and country. Use a NATURAL JOIN to produce the result.

Solution:	
SQL statement	SELECT location_id, street_address, city, state_province, country_name FROM locations NATURAL JOIN countries;

Output display				
	location_id	street_address	city	state_province	cou

location_id	street_address	city	state_province	cou
1000	1297 Via Cola di Rie	Roma	NULL	Italy
1100	93091 Calle della Testa	Venice	NULL	Italy
1200	2017 Shinjuku-ku	Tokyo	Tokyo Prefecture	Japa
1300	9450 Kamiya-cho	Hiroshima	NULL	Japa
1400	2014 Jabberwocky Rd	Southlake	Texas	Unit
1500	2011 Interiors Blvd	South San Francisco	California	Unit
1600	2007 Zagora St	South Brunswick	New Jersey	Unit
1700	2004 Charade Rd	Seattle	Washington	Unit
1800	147 Spadina Ave	Toronto	Ontario	Can
1900	6092 Boxwood St	Whitehorse	Yukon	Can
2000	40-5-12 Laogianggen	Beijing	NULL	Chir
2100	1298 Vileparle (E)	Bombay	Maharashtra	India
2200	12-98 Victoria Street	Sydney	New South Wales	Aus
2300	198 Clementi North	Singapore	NULL	Sing
2400	8204 Arthur St	London	NULL	Unit
2500	Magdalen Centre, The Oxford Science Park	Oxford	Oxford	Unit
2600	9702 Chester Road	Stretford	Manchester	Unit
2700	Schwanthalerstr. 7031	Munich	Bavaria	Ger
2800	Rua Frei Caneca 1360	Sao Paulo	Sao Paulo	Braz
2900	20 Rue des Corps-Saints	Geneva	Geneve	Swi
3000	Murtenstrasse 921	Bern	BE	Swi
3100	Pieter Breughelstraat 837	Utrecht	Utrecht	Neth
3200	Mariano Escobedo 9991	Mexico City	Distrito Federal,	Mex

3. The HR department needs a report of all employees. Write a query to display the last name, department number, and department name for these employees.

Solution:	

SQL statement	`SELECT e.last_name, e.department_id, d.department_name`
	`FROM employees e`
	`JOIN departments d ON e.department_id = d.department_id;`

Output display	

last_name	department_id	department_name
Whalen	10	Administration
Harstein	20	Marketing
Fay	20	Marketing
Raphaely	30	Purchasing
Khoo	30	Purchasing
Baida	30	Purchasing
Tobias	30	Purchasing
Himuro	30	Purchasing
Colmenares	30	Purchasing
Mavris	40	Human Resources
Weiss	50	Shipping
Fripp	50	Shipping
Kaufling	50	Shipping
Vollman	50	Shipping
Mourgos	50	Shipping
Nayer	50	Shipping
Mikkilineni	50	Shipping
Landry	50	Shipping
Markle	50	Shipping
Bissot	50	Shipping
Atkinson	50	Shipping
Marlow	50	Shipping
Olson	50	Shipping
Mallin	50	Shipping
Rogers	50	Shipping

4. Create a report to display employees last name and employee number along with their manager's last name and manager number. Label the columns Employee, Emp#, Manager, and Mgr#, respectively.

Solution:	
SQL statement	SELECT e.last_name AS Employee, e.employee_id AS "Emp#", m.last_name AS Manager, m.employee_id AS "Mgr#" FROM employees e JOIN employees m ON e.manager_id = m.employee_id;

Output display				
	Employee	Emp#	Manager	Mgr#
	Kochhar	101	King	100
	De Haan	102	King	100
	Hunold	103	De Haan	102
	Ernst	104	Hunold	103
	Austin	105	Hunold	103
	Pataballa	106	Hunold	103
	Lorentz	107	Hunold	103
	Greenberg	108	Kochhar	101
	Faviet	109	Greenberg	108
	Chen	110	Greenberg	108
	Sciarra	111	Greenberg	108
	Urman	112	Greenberg	108
	Popp	113	Greenberg	108
	Raphaely	114	King	100
	Khoo	115	Raphaely	114
	Baida	116	Raphaely	114
	Tobias	117	Raphaely	114
	Himuro	118	Raphaely	114
	Colmenares	119	Raphaely	114
	Weiss	120	King	100
	Fripp	121	King	100
	Kaufling	122	King	100
	Vollman	123	King	100
	Mourgos	124	King	100
	Nayer	125	Weiss	120

5. Modify Q3, to display all employees including who has no manager. Order the results by the employee number.

Solution:	
SQL statement	SELECT e.last_name AS Employee, e.employee_id AS "Emp#", m.last_name AS Manager, m.employee_id AS "Mgr#" FROM employees e LEFT JOIN employees m ON e.manager_id = m.employee_id ORDER BY e.employee_id;

Output display					
		Extra options			
		Employee	**Emp#**	**Manager**	**Mgr#**
		Kochhar	101	King	100
		De Haan	102	King	100
		Hunold	103	De Haan	102
		Ernst	104	Hunold	103
		Austin	105	Hunold	103
		Pataballa	106	Hunold	103
		Lorentz	107	Hunold	103
		Greenberg	108	Kochhar	101
		Faviet	109	Greenberg	108
		Chen	110	Greenberg	108
		Sciarra	111	Greenberg	108
		Urman	112	Greenberg	108
		Popp	113	Greenberg	108
		Raphaely	114	King	100
		Khoo	115	Raphaely	114
		Baida	116	Raphaely	114
		Tobias	117	Raphaely	114
		Himuro	118	Raphaely	114
		Colmenares	119	Raphaely	114
		Weiss	120	King	100
		Fripp	121	King	100
		Kaufling	122	King	100
		Vollman	123	King	100
		Mourgos	124	King	100
		Nayer	125	Weiss	120