Practice 12

Practice name	Displaying Data from Multiple Tables
Academic Program	Software Engineering
Subject name	Laboratory of Database Systems II
Unit	I. SQL.
Professor	Aldonso Becerra Sánchez
Due date	November 4, 2021
Due date with penalty	November 5, 2021
Elaboration date	November 2, 2021

Practice objective	Use SQL SELECT statements for retrieving data from several tables.
Estimated time of completion	5 hours
Introduction	SQL language allows the realization of projection and selection of data from several tables to satisfy the needs of reports that may be required for a programmer, developer or end user.

Reference 1:

1. Oracle Database 11g: SQL Fundamentals.

Reference 2:

2. Oracle Database SQL Language Reference 11g.

Reference 3:

Initial Activity:

Read the whole practice before start it.

Write the corresponding report, starting with the **Introduction** section.

Activity 1:

Write the section that describes the **Work developed** in the following activities.

Read all the choices carefully because there might be more than one correct answer. Choose all the correct answers for each question.

Explain the reason for your answer.

WRITE SELECT STATEMENTS TO ACCESS DATA FROM MORE THAN ONE TABLE USING EQUIJOINS AND NONEQUIJOINS

1. The EMPLOYEES and DEPARTMENTS tables have two identically named columns:

DEPARTMENT_ID and MANAGER_ID. Which of these statements joins these tables based only on common DEPARTMENT_ID values? (Choose all that apply.)

A. SELECT * FROM EMPLOYEES NATURAL JOIN DEPARTMENTS;

B. SELECT * FROM EMPLOYEES E NATURAL JOIN DEPARTMENTS D ON

E.DEPARTMENT_ID=D.DEPARTMENT_ID;

C. SELECT * FROM EMPLOYEES NATURAL JOIN DEPARTMENTS USING

(DEPARTMENT_ID);

D. None of the above

2. The EMPLOYEES and DEPARTMENTS tables have two identically named columns:

DEPARTMENT_ID and MANAGER_ID. Which statements join these tables based on both column values? (Choose all that apply.)

A. SELECT * FROM EMPLOYEES NATURAL JOIN DEPARTMENTS;

B. SELECT * FROM EMPLOYEES JOIN DEPARTMENTS USING
(DEPARTMENT_ID,MANAGER_ID);

C. SELECT * FROM EMPLOYEES E JOIN DEPARTMENTS D ON
E.DEPARTMENT_ID=D.DEPARTMENT_ID AND
E.MANAGER_ID=D.MANAGER_ID;

D. None of the above

3. Which join is performed by the following query?

SELECT E.JOB_ID,J.JOB_ID

FROM EMPLOYEES E JOIN JOBS J ON (E.SALARY < J.MAX_SALARY);
(Choose the best answer.)

A. Equijoin

B. Nonequijoin

C. Cross join

D. Outer join

4. Which of the following statements are syntactically correct? (Choose all that apply.)

A. SELECT * FROM EMPLOYEES E JOIN DEPARTMENTS D USING (DEPARTMENT_ID);

B. SELECT * FROM EMPLOYEES JOIN DEPARTMENTS D USING (D.DEPARTMENT_ID);

C. SELECT D.DEPARTMENT_ID FROM EMPLOYEES JOIN DEPARTMENTS D USING (DEPARTMENT_ID);

D. None of the above

5. Which of the following statements are syntactically correct? (Choose all that apply.)

A. SELECT E.EMPLOYEE_ID, J.JOB_ID PREVIOUS_JOB, E.JOB_ID CURRENT_JOB FROM JOB_HISTORY J CROSS JOIN EMPLOYEES E ON (J.START_DATE=E.HIRE_DATE);

B. SELECT E.EMPLOYEE_ID, J.JOB_ID PREVIOUS_JOB, E.JOB_ID CURRENT_JOB FROM JOB_HISTORY J JOIN EMPLOYEES E ON (J.START_DATE=E.HIRE_DATE);

C. SELECT E.EMPLOYEE_ID, J.JOB_ID PREVIOUS_JOB, E.JOB_ID CURRENT_JOB FROM JOB_HISTORY J OUTER JOIN EMPLOYEES E ON (J.START_DATE=E.HIRE_DATE);

D. None of the above

6. Choose one correct statement regarding the following query:

SELECT *

FROM EMPLOYEES E JOIN DEPARTMENTS D ON (D.DEPARTMENT_ID=E.DEPARTMENT_ID) JOIN LOCATIONS L ON (L.LOCATION_ID =D.LOCATION_ID);

A. Joining three tables is not permitted.

B. A Cartesian product is generated.

C. The JOIN...ON clause may be used for joins between multiple tables.

D. None of the above

JOIN A TABLE TO ITSELF USING A SELF-JOIN

7. How many rows are returned after executing the following statement?

SELECT *

FROM REGIONS R1 JOIN REGIONS R2 ON (R1.REGION_ID=LENGTH(R2. REGION_NAME)/2);

The REGIONS table contains the following row data. (Choose the best answer.)

REGION_ID	REGION_NAME
1	Europe
2	Americas
3	Asia
4	Middle East and Africa

A. 2

B. 3

C. 4

D. None of the above

VIEW DATA THAT DOES NOT MEET A JOIN CONDITION USING OUTER JOINS

8. Choose one correct statement regarding the following query.

SELECT C.COUNTRY_ID

FROM LOCATIONS L RIGHT OUTER JOIN COUNTRIES C

ON (L.COUNTRY_ID=C.COUNTRY_ID)

WHERE L.COUNTRY_ID is NULL

A. No rows in the LOCATIONS table have the COUNTRY_ID values returned.

B. No rows in the COUNTRIES table have the COUNTRY_ID values returned.

C. The rows returned represent the COUNTRY_ID values for all the rows in the LOCATIONS table.

D. None of the above

9. Which of the following statements are syntactically correct? (Choose all that apply.)

A. SELECT JH.JOB_ID FROM JOB_HISTORY JH RIGHT OUTER JOIN JOBS J ON JH.JOB_ID=J.JOB_ID

B. SELECT JOB_ID FROM JOB_HISTORY JH RIGHT OUTER JOIN JOBS J ON (JH.JOB_ID=J.JOB_ID)

C. SELECT JOB_HISTORY.JOB_ID FROM JOB_HISTORY OUTER JOIN JOBS ON JOB_HISTORY.JOB_ID=JOBS.JOB_ID

D. None of the above

GENERATE A CARTESIAN PRODUCT OF TWO OR MORE TABLES

10. If the REGIONS table, which contains 4 rows, is cross joined to the COUNTRIES table, which contains 25 rows, how many rows appear in the final results set? (Choose the best answer.)

A. 100 rows

B. 4 rows

C. 25 rows

D. None of the above

Activity 2:

Propose an answer to the following issues:

- You are required to retrieve information from multiple tables, group the results, and apply an aggregate function to them. Can a group function be used against data from multiple table sources?
- When joining two tables, there is a risk that between them they contain common column names. Does Oracle know which tables to fetch data from if such columns are present in the SELECT list?
- The NATURAL JOIN clause is used to join rows from two tables based on columns with common names sharing identical values. Is it possible to join two tables based on some of the shared columns and not all of them?
- The data in two tables you wish to join is related but does not share any identically named columns. Is it possible to join tables using columns that do not share the same name?
- You wish to divide staff into four groups named after the four regions in the REGIONS table. Is it possible to obtain a list of EMPLOYEE_ID, LAST_NAME, and REGION_NAME values for each employee by joining the EMPLOYEE_ID and REGION_ID columns in a round-robin manner?
- You are required to retrieve a list of DEPARTMENT_NAME and LAST_NAME values for all departments, including those that currently have no employees assigned to them. In such cases the string 'No Employees' should be displayed as the LAST_NAME column value. Can this be done using joins?

Activity 3:

Connect to the OE schema and complete the following tasks.

You are required to produce a report of customers who purchased products with list prices of more than $1000. The report must contain customer first and last names and the product names and their list prices. Customer information is stored in the CUSTOMERS table, which has the CUSTOMER_ID column as its primary key. The product name and list price details are stored in the PRODUCT_INFORMATION table with the PRODUCT_ID column as its primary key. Two other related tables may assist in generating the required report: the ORDERS table, which stores the CUSTOMER_ID and ORDER_ID information, and the ORDER_ITEMS table, which stores the PRODUCT_ID values associated with each ORDER_ID. There are several approaches to solving this question.
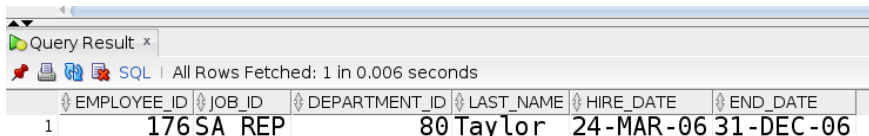
Query Result ×

SQL | All Rows Fetched: 14 in 0.267 seconds

	CUST_FIRST_NAME	CUST_LAST_NAME	PRODUCT_NAME	LIST_PRICE
1	Gustav	Steenburgen	Desk - W/48	2500
2	Maurice	Mahoney	Desk - W/48	2500
3	Ishwarya	Roberts	Desk - W/48	2500
4	Goldie	Slater	Desk - W/48	2500
5	Divine	Sheen	SPNIX4.0 - SL	1500
6	Frederico	Romero	Monitor 21/SD	1023
7	Harrison	Pacino	Laptop 32/10/56	1749
8	Eddie	Boyer	Laptop 128/12/56/v90/110	3219
9	Hema	Voight	Laptop 128/12/56/v90/110	3219
10	Sivaji	Landis	Desk - W/48	2500
11	Harrison	Sutherland	Laptop 32/10/56	1749
12	Matthias	MacGraw	SPNIX4.0 - SL	1500
13	Matthias	Cruise	Desk - W/48	2500
14	Guillaume	Edwards	Desk - W/48	2500

NOTE: Capture an image for each statement output.

Activity 4:

This exercise must be performed in the HR schema.

a) The JOB_HISTORY table shares three identically named columns with the EMPLOYEES table: EMPLOYEE_ID, JOB_ID, and DEPARTMENT_ID. You are required to describe the tables and fetch the EMPLOYEE_ID, JOB_ID, DEPARTMENT_ID, LAST_NAME, HIRE_DATE, and END_DATE values for all rows retrieved using a pure natural join. Alias the EMPLOYEES table as EMP and the JOB_HISTORY table as JH and use dot notation where possible.
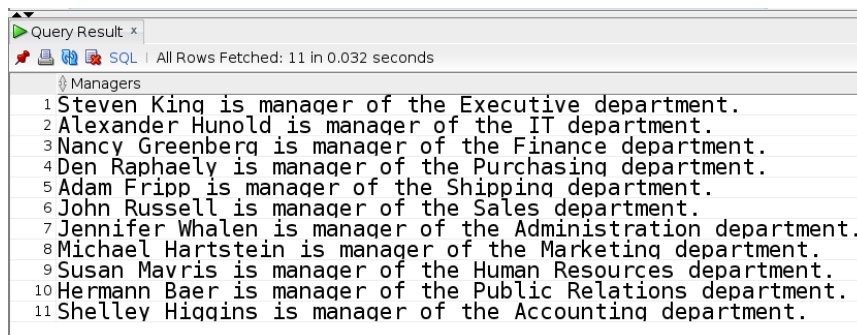
EMPLOYEE_ID	JOB_ID	DEPARTMENT_ID	LAST_NAME	HIRE_DATE	END_DATE
1	176 SA_REP	80	Taylor	24-MAR-06	31-DEC-06

Query Result — All Rows Fetched: 1 in 0.006 seconds

b) Each record in the DEPARTMENTS table has a MANAGER_ID column matching an EMPLOYEE_ID value in the EMPLOYEES table. You are required to produce a report with one column aliased as Managers. Each row must contain a sentence of the format FIRST_NAME LAST_NAME is manager of the DEPARTMENT_NAME department. Alias the EMPLOYEES table as E and the DEPARTMENTS table as D and use dot notation where possible.

Query Result — All Rows Fetched: 11 in 0.032 seconds

Managers
1. Steven King is manager of the Executive department.
2. Alexander Hunold is manager of the IT department.
3. Nancy Greenberg is manager of the Finance department.
4. Den Raphaely is manager of the Purchasing department.
5. Adam Fripp is manager of the Shipping department.
6. John Russell is manager of the Sales department.
7. Jennifer Whalen is manager of the Administration department.
8. Michael Hartstein is manager of the Marketing department.
9. Susan Mavris is manager of the Human Resources department.
10. Hermann Baer is manager of the Public Relations department.
11. Shelley Higgins is manager of the Accounting department.

c) There is a hierarchical relationship between employees and their managers. For each row in the EMPLOYEES table the MANAGER_ID column stores the EMPLOYEE_ID of every employee's manager. Using a self-join on the EMPLOYEES table, you are required to retrieve the employee's LAST_NAME, EMPLOYEE_ID, manager's LAST_NAME, and employee's DEPARTMENT_ID for the rows with DEPARMENT_ID values of 10, 20, or 30. Alias the EMPLOYEES table as E and the second instance of the EMPLOYEES table as M. Sort the results based on the DEPARTMENT_ID column.

EMPLOYEE	EMPLOYEE_ID	MANAGER_ID	MANAGER	DEPARTMENT_ID
1 Whalen	200	101	Kochhar	10
2 Fay	202	201	Hartstein	20
3 Hartstein	201	100	King	20
4 Tobias	117	114	Raphaely	30
5 Baida	116	114	Raphaely	30
6 Himuro	118	114	Raphaely	30
7 Khoo	115	114	Raphaely	30
8 Raphaely	114	100	King	30
9 Colmenares	119	114	Raphaely	30

d) Write a query for the 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 in the output. Use a NATURAL JOIN to produce the results.

LOCATION_ID	STREET_ADDRESS	CITY	STATE_PROVINCE	COUNTRY_NAME
1	1000 1297 Via Cola di Rie	Roma	(null)	Italy
2	1100 93091 Calle della Testa	Venice	(null)	Italy
3	1200 2017 Shinjuku-ku	Tokyo	Tokyo Prefecture	Japan
4	1300 9450 Kamiya-cho	Hiroshima	(null)	Japan
5	1400 2014 Jabberwocky Rd	Southlake	Texas	United States o
6	1500 2011 Interiors Blvd	South San Fran...	California	United States o
7	1600 2007 Zagora St	South Brunswick	New Jersey	United States o
8	1700 2004 Charade Rd	Seattle	Washington	United States o
9	1800 147 Spadina Ave	Toronto	Ontario	Canada
10	1900 6092 Boxwood St	Whitehorse	Yukon	Canada
11	2000 40-5-12 Laogianggen	Beijing	(null)	China
12	2100 1298 Vileparle (E)	Bombay	Maharashtra	India
13	2200 12-98 Victoria Street	Sydney	New South Wales	Australia
14	2300 198 Clementi North	Singapore	(null)	Singapore
15	2400 8204 Arthur St	London	(null)	United Kingdom
16	2500 Magdalen Centre, The Oxf...	Oxford	Oxford	United Kingdom
17	2600 9702 Chester Road	Stretford	Manchester	United Kingdom
18	2700 Schwanthalerstr. 7031	Munich	Bavaria	Germany
19	2800 Rua Frei Caneca 1360	Sao Paulo	Sao Paulo	Brazil
20	2900 20 Rue des Corps-Saints	Geneva	Geneve	Switzerland
21	3000 Murtenstrasse 921	Bern	BE	Switzerland

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

LAST_NAME	DEPARTMENT_ID	DEPARTMENT_NAME
1 Whalen	10	Administration
2 Fay	20	Marketing
3 Hartstein	20	Marketing
4 Tobias	30	Purchasing
5 Colmenares	30	Purchasing
6 Baida	30	Purchasing
7 Raphaely	30	Purchasing
8 Khoo	30	Purchasing
9 Himuro	30	Purchasing
10 Mavris	40	Human Resources
11 Feeney	50	Shipping
12 Fleaur	50	Shipping
13 Fripp	50	Shipping
14 Gates	50	Shipping
15 Gee	50	Shipping
16 Geoni	50	Shipping
17 Grant	50	Shipping
18 Jones	50	Shipping

f) The HR department needs a report to display the last name, job, department number, and department name for all employees who work in a city entered by a user parameter.

For instance, city equals 'toronto':

Query Result ×

SQL | All Rows Fetched: 2 in 0.036 seconds

LAST_NAME	JOB_ID	DEPARTMENT_ID	DEPARTMENT_NAME
1 Hartstein	MK MAN	20	Marketing
2 Fay	MK REP	20	Marketing

g) Crete a report to display employees' last names and employee number along with their managers' last names and manager number. Label the columns Employee, Emp# , Manager, and Mgr#, respectively.

Query Result ×

SQL | Fetched 50 rows in 0.013 seconds

Employee	EMP#	Manager	Mgr#
1 Kumar	173	Cambrault	148
2 Bates	172	Cambrault	148
3 Smith	171	Cambrault	148
4 Fox	170	Cambrault	148
5 Bloom	169	Cambrault	148
6 Ozer	168	Cambrault	148
7 Hunold	103	De Haan	102
8 Banda	167	Errazuriz	147
9 Ande	166	Errazuriz	147
10 Lee	165	Errazuriz	147
11 Marvins	164	Errazuriz	147
12 Greene	163	Errazuriz	147
13 Vishney	162	Errazuriz	147
14 Cabrio	187	Fripp	121
15 Dellinger	186	Fripp	121
16 Bull	185	Fripp	121
17 Sarchand	184	Fripp	121

h) Modify previous sentence to display all employees including those who have no manager. Order the results by the employee number.

Query Result ×

SQL | Fetched 50 rows in 0.011 seconds

Employee	EMP#	Manager	Mgr#
1 King	100	(null)	(null)
2 Kochhar	101	King	100
3 De Haan	102	King	100
4 Hunold	103	De Haan	102
5 Ernst	104	Hunold	103
6 Austin	105	Hunold	103
7 Pataballa	106	Hunold	103
8 Lorentz	107	Hunold	103
9 Greenberg	108	Kochhar	101
10 Faviet	109	Greenberg	108
11 Chen	110	Greenberg	108
12 Sciarra	111	Greenberg	108
13 Urman	112	Greenberg	108
14 Popp	113	Greenberg	108
15 Raphaely	114	King	100
16 Khoo	115	Raphaely	114
17 Baida	116	Raphaely	114

i) Create a report for the HR department that displays employee last names, department name for all the employees along with their colleagues. Give each column an appropriate label and order the results as you consider appropriate to the study case.

```
Query Result ×
SQL | Fetched 50 rows in 0.012 seconds
     DEPARTMENT  EMPLOYEE        COLLEAGUE
  1           20 Fay             Hartstein
  2           20 Hartstein       Fay
  3           30 Baida           Colmenares
  4           30 Baida           Himuro
  5           30 Baida           Khoo
  6           30 Baida           Raphaely
  7           30 Baida           Tobias
  8           30 Colmenares      Baida
  9           30 Colmenares      Himuro
 10           30 Colmenares      Khoo
 11           30 Colmenares      Raphaely
 12           30 Colmenares      Tobias
 13           30 Himuro          Baida
 14           30 Himuro          Colmenares
 15           30 Himuro          Khoo
 16           30 Himuro          Raphaely
 17           30 Himuro          Tobias
 18           30 Khoo            Baida
```

j) The HR department needs a report on job grades and salaries. To familiarize yourself with the JOB_GRADES table, first show the structure of the JOB_GRADES table. Then create a query that displays the name, job, department name, salary, and grade for all employees.


```
Query Result ×
SQL | Fetched 50 rows in 0.031 seconds
    LAST_NAME   JOB_ID      DEPARTMENT_NAME       SALARY GRADE_LEVEL
 1 King         AD  PRES    Executive             24000 E
 2 Kochhar      AD  VP      Executive             17000 E
 3 De Haan      AD  VP      Executive             17000 E
 4 Russell      SA  MAN     Sales                 14000 D
 5 Partners     SA  MAN     Sales                 13500 D
 6 Hartstein    MK  MAN     Marketing             13000 D
 7 Higgins      AC  MGR     Accounting            12008 D
 8 Greenberg    FI  MGR     Finance               12008 D
 9 Errazuriz    SA  MAN     Sales                 12000 D
10 Ozer         SA  REP     Sales                 11500 D
11 Cambrault    SA  MAN     Sales                 11000 D
12 Raphaely     PU  MAN     Purchasing            11000 D
13 Abel         SA  REP     Sales                 11000 D
14 Vishney      SA  REP     Sales                 10500 D
15 Zlotkey      SA  MAN     Sales                 10500 D
16 Baer         PR  REP     Public Relations      10000 D
17 Bloom        SA  REP     Sales                 10000 D
18 King         SA  REP     Sales                 10000 D
entifier with the Control key down to perform "Go to Declaration"
```

k) HR department wants to create a query to display the name and hire date of any employee hired after an employee entered by a user parameter.

For Instance, after 'Davies':

```
Query Result ×
SQL | Fetched 50 rows in 0.014 seconds
     LAST_NAME        HIRE_DATE
  1  Ande             24-MAR-08
  2  Atkinson         30-OCT-05
  3  Austin           25-JUN-05
  4  Baida            24-DEC-05
  5  Banda            21-APR-08
  6  Bates            24-MAR-07
  7  Bernstein        24-MAR-05
  8  Bissot           20-AUG-05
  9  Bloom            23-MAR-06
 10  Bull             20-FEB-05
 11  Cabrio           07-FEB-07
 12  Cambrault        15-OCT-07
 13  Cambrault        09-DEC-06
 14  Chen             28-SEP-05
 15  Chung            14-JUN-05
 16  Colmenares       10-AUG-07
 17  Dellinger        24-JUN-06
 18  Dilly            12-AUG-05
```

l) The HR department needs to find the names and hire dates for all employees who were hired before their managers, along with their managers' names and hire dates.


```
Query Result ×
SQL | All Rows Fetched: 37 in 0.009 seconds
     LAST_NAME    HIRE_DATE     LAST_NAME_1   HIRE_DATE_1
  1  Kaufling     01-MAY-03  King          17-JUN-03
  2  Raphaely     07-DEC-02  King          17-JUN-03
  3  De Haan      13-JAN-01  King          17-JUN-03
  4  Higgins      07-JUN-02  Kochhar       21-SEP-05
  5  Baer         07-JUN-02  Kochhar       21-SEP-05
  6  Mavris       07-JUN-02  Kochhar       21-SEP-05
  7  Whalen       17-SEP-03  Kochhar       21-SEP-05
  8  Greenberg    17-AUG-02  Kochhar       21-SEP-05
  9  Austin       25-JUN-05  Hunold        03-JAN-06
 10  Faviet       16-AUG-02  Greenberg     17-AUG-02
 11  Bull         20-FEB-05  Fripp         10-APR-05
 12  Sarchand     27-JAN-04  Fripp         10-APR-05
 13  Marlow       16-FEB-05  Fripp         10-APR-05
 14  Everett      03-MAR-05  Vollman       10-OCT-05
 15  Bell         04-FEB-04  Vollman       10-OCT-05
 16  Ladwig       14-JUL-03  Vollman       10-OCT-05
 17  OConnell     21-JUN-07  Mourgos       16-NOV-07
 18  Feeney       23-MAY-06  Mourgos       16-NOV-07
```

m) The DEPARTMENTS table contains details of all departments in the organization. You are required to retrieve the DEPARTMENT_NAME and DEPARTMENT_ID values for those departments to which no employees are currently assigned.

DEPARTMENT_NAME	DEPARTMENT_ID
1 Treasury	120
2 Corporate Tax	130
3 Control And Credit	140
4 Shareholder Services	150
5 Benefits	160
6 Manufacturing	170
7 Construction	180
8 Contracting	190
9 Operations	200
10 IT Support	210
11 NOC	220
12 IT Helpdesk	230
13 Government Sales	240
14 Retail Sales	250
15 Recruiting	260
16 Payroll	270

n) You are required to obtain the number of rows in the EMPLOYEES and DEPARTMENTS table as well as the number of records that would be created by a Cartesian product of these two tables. Confirm your results by explicitly counting and multiplying the number of rows present in each of these tables.

Task completed in 0.

```
  COUNT(*)
----------
      2889


  COUNT(*)
----------
       107


  COUNT(*)
----------
        27


   107*27
----------
      2889
```

NOTE: Capture an image for each statement output.

Activity 5:

This practice is intended to give you experience in extracting data from more than one table using the SQL:1999–compliant joins.

1. Write a query for the 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 in the output. Use a NATURAL JOIN to produce the results.

	LOCATION_ID	STREET_ADDRESS	CITY	STATE_PROVINCE	COUNTRY_NAME
1	1400	2014 Jabberwocky Rd	Southlake	Texas	United States of America
2	1500	2011 Interiors Blvd	South San Francisco	California	United States of America
3	1700	2004 Charade Rd	Seattle	Washington	United States of America
4	1800	460 Bloor St. W.	Toronto	Ontario	Canada
5	2500	Magdalen Centre, The ...	Oxford	Oxford	United Kingdom

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

	LAST_NAME	DEPARTMENT_ID	DEPARTMENT_NAME
1	Whalen	10	Administration
2	Hartstein	20	Marketing
3	Fay	20	Marketing
4	Davies	50	Shipping
5	Vargas	50	Shipping
6	Rajs	50	Shipping
7	Mourgos	50	Shipping
8	Matos	50	Shipping
9	Hunold	60	IT
10	Ernst	60	IT

. . .

18	Higgins	110	Accounting
19	Gietz	110	Accounting

3. The HR department needs a report of employees in Toronto. Display the last name, job, department number, and the department name for all employees who work in Toronto.

	LAST_NAME	JOB_ID	DEPARTMENT_ID	DEPARTMENT_NAME
1	Hartstein	MK_MAN	20	Marketing
2	Fay	MK_REP	20	Marketing

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. Save your SQL statement as lab_12_04.sql. Run the query.

	Employee	EMP#	Manager	Mgr#
1	Kochhar	101	King	100
2	De Haan	102	King	100
3	Hunold	103	De Haan	102
4	Ernst	104	Hunold	103
5	Lorentz	107	Hunold	103
6	Mourgos	124	King	100
7	Rajs	141	Mourgos	124
8	Davies	142	Mourgos	124
9	Matos	143	Mourgos	124
10	Vargas	144	Mourgos	124

. . .

	Employee	EMP#	Manager	Mgr#
15	Whalen	200	Kochhar	101
16	Hartstein	201	King	100
17	Fay	202	Hartstein	201
18	Higgins	205	Kochhar	101
19	Gietz	206	Higgins	205

5. Modify lab_12_04.sql to display all employees including King, who has no manager. Order the results by the employee number. Save your SQL statement as lab_12_05.sql. Run the query in lab_12_05.sql.

	Employee	EMP#	Manager	Mgr#
1	King	100	(null)	(null)
2	Kochhar	101	King	100
3	De Haan	102	King	100
4	Hunold	103	De Haan	102
5	Ernst	104	Hunold	103
6	Lorentz	107	Hunold	103
7	Mourgos	124	King	100
8	Rajs	141	Mourgos	124
9	Davies	142	Mourgos	124
10	Matos	143	Mourgos	124

. . .

18	Fay	202	Hartstein	201
19	Higgins	205	Kochhar	101
20	Gietz	206	Higgins	205

6. Create a report for the HR department that displays employee last names, department numbers, and all the employees who work in the same department as a given employee. Give each column an appropriate label. Save the script to a file named `lab_12_06.sql`.

	DEPARTMENT	EMPLOYEE	COLLEAGUE
1	20	Fay	Hartstein
2	20	Hartstein	Fay
3	50	Davies	Matos
4	50	Davies	Mourgos
5	50	Davies	Rajs
6	50	Davies	Vargas
7	50	Matos	Davies
8	50	Matos	Mourgos
9	50	Matos	Rajs
10	50	Matos	Vargas

...

| 42 | 110 | Higgins | Gietz |

7. The HR department needs a report on job grades and salaries. To familiarize yourself with the JOB_GRADES table, first show the structure of the JOB_GRADES table. Then create a query that displays the name, job, department name, salary, and grade for all employees.

```
DESC JOB_GRADES
Name                                  Null      Type
------------------------------   --------   --------------
GRADE_LEVEL                                  VARCHAR2(3)
LOWEST_SAL                                   NUMBER
HIGHEST_SAL                                  NUMBER


3 rows selected
```

	LAST_NAME	JOB_ID	DEPARTMENT_NAME	SALARY	GRADE_LEVEL
1	Vargas	ST_CLERK	Shipping	2500	A
2	Matos	ST_CLERK	Shipping	2600	A
3	Davies	ST_CLERK	Shipping	3100	B
4	Rajs	ST_CLERK	Shipping	3500	B
5	Lorentz	IT_PROG	IT	4200	B
6	Whalen	AD_ASST	Administration	4400	B
7	Mourgos	ST_MAN	Shipping	5800	B
8	Ernst	IT_PROG	IT	6000	C
9	Fay	MK_REP	Marketing	6000	C
10	Gietz	AC_ACCOUNT	Accounting	8300	C

▪ ▪ ▪

18	De Haan	AD_VP	Executive	17000	E
19	King	AD_PRES	Executive	24000	E

8. The HR department wants to determine the names of all the employees who were hired after Davies. Create a query to display the name and hire date of any employee hired after employee Davies.

	LAST_NAME	HIRE_DATE
1	Lorentz	07-FEB-99
2	Mourgos	16-NOV-99
3	Matos	15-MAR-98
4	Vargas	09-JUL-98
5	Zlotkey	29-JAN-00
6	Taylor	24-MAR-98
7	Grant	24-MAY-99
8	Fay	17-AUG-97

9. The HR department needs to find the names and hire dates of all the employees who were hired before their managers, along with their managers' names and hire dates. Save the script to a file named `lab_12_09.sql`.

	LAST_NAME	HIRE_DATE	LAST_NAME_1	HIRE_DATE_1
1	Whalen	17-SEP-87	Kochhar	21-SEP-89
2	Hunold	03-JAN-90	De Haan	13-JAN-93
3	Vargas	09-JUL-98	Mourgos	16-NOV-99
4	Matos	15-MAR-98	Mourgos	16-NOV-99
5	Davies	29-JAN-97	Mourgos	16-NOV-99
6	Rajs	17-OCT-95	Mourgos	16-NOV-99
7	Grant	24-MAY-99	Zlotkey	29-JAN-00
8	Taylor	24-MAR-98	Zlotkey	29-JAN-00
9	Abel	11-MAY-96	Zlotkey	29-JAN-00

Activity 6:

Write the **Pre-assessment** section.

Final activity:

Write the **Conclusion** section.

Attached file that is required for this task (optional):

```sql
CREATE TABLE job_grades (
                grade         CHAR(1),
                lowest_sal    NUMBER(8,2) NOT NULL,
                highest_sal   NUMBER(8,2) NOT NULL
                );


                ALTER TABLE job_grades
                ADD CONSTRAINT jobgrades_grade_pk
                PRIMARY KEY (grade);


                INSERT INTO job_grades VALUES ('A', 1000, 2999);
                INSERT INTO job_grades VALUES ('B', 3000, 5999);
                INSERT INTO job_grades VALUES ('C', 6000, 9999);
                INSERT INTO job_grades VALUES ('D', 10000, 14999);
                INSERT INTO job_grades VALUES ('E', 15000, 24999);
                INSERT INTO job_grades VALUES ('F', 25000, 40000);


                COMMIT;
```

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