Course Name: Database Systems	**Course Code: CS363L**
Assignment Type: Lab	**Dated: 31-01-2022**
Semester: 6th	**Session: 2019**
Lab/Project/Assignment #: Lab 3	**CLOs to be covered: CLO1**
Lab Title: Practicing queries with Joins	**Teacher Name: Ms. Darakhshan**

Lab Evaluation:

CLO1	Construct DML queries to retrieve and store data in different relations					
Levels (Marks)	**Level1**	**Level2**	**Level3**	**Level4**	**Level5**	**Level6**
Cognitive (5)						
					Total	**/5**

Rubrics for Current Lab:

Scale	Marks	Level	Rubric
Excellent	**5**	L1	Completed all questions and understands how inner, left, right and outer join works.
Very Good	**4**	L2	Completed 8 questions and understands how tasks were solved.
Good	**3**	L3	Completed 5 questions and understands significant number of problems.
Basic	**2**	L4	Completed 2 questions and weak understanding.
Barely Acceptable	**1**	L5	Completed 1 question and weak understanding.
Not Acceptable	**0**	L6	Lab missed or solved none of the problems.

Rubrics for Homework

Scale	Marks	Level	Rubric
Excellent	**5**	L1	Completed all 12 questions. Understands the concept of Join. No plagiarism involved. Can re-write query for a different schema related to the mentioned concepts. No plagiarism
Very Good	**4**	L2	Completed 9 questions. Understands the question and can re-write query related to the learned concepts. No plagiarism
Good	**3**	L3	Completed 6 questions. Understands the question and can re-write query related to the learned concepts. No plagiarism
Barely Acceptable	**1**	L4	Completed 3 questions. Understands the question and can re-write query related to the learned concepts. No plagiarism
Not Acceptable	**0**	L5	Completed none or missed lab.

LAB DETAILS:

Lab Goals/Objectives:

- JOINS

Theory/Relevant Material:

Topic 6.2 from First Course in Database Systems 3rd Edition by Ullman
Chap 3 from TSQL Fundamentals – Professional (latest Ed.) by Itzik Ben-Gan

Lab Tasks:

Answer these queries in the context of Northwind schema.

Exercise 1.1:

Write a query that generates five copies of each employee row: Tables involved: HR.Employees and dbo.Nums
Desired output (and some other rows):

```
empid       firstname  lastname              n
----------- ---------- -------------------- -----
1           Sara       Davis                1
2           Don        Funk                 1
3           Judy       Lew                  1
4           Yael       Peled                1

5           Sven       Mortensen            1
6           Paul       Suurs                1
7           Russell    King                 1
8           Maria      Cameron              1
9           Patricia   Doyle                1
1           Sara       Davis                2
2           Don        Funk                 2
3           Judy       Lew                  2
4           Yael       Peled                2
5           Sven       Mortensen            2
6           Paul       Suurs                2
7           Russell    King                 2
8           Maria      Cameron              2
9           Patricia   Doyle                2
1           Sara       Davis                3
2           Don        Funk                 3
3           Judy       Lew                  3
4           Yael       Peled                3
5           Sven       Mortensen            3
6           Paul       Suurs                3
7           Russell    King                 3
8           Maria      Cameron              3
```

Exercise 1.2:

Write a query that returns a row for each employee and day in the range June 12, 2016 through June 16, 2016:
Tables involved: HR.Employees and dbo.Nums
Desired output (and some other rows)**:**

```
empid       dt
----------- -----------
1           2016-06-12
1           2016-06-13
1           2016-06-14
1           2016-06-15
1           2016-06-16
```

```
2    2016-06-12
2    2016-06-13
2    2016-06-14
2    2016-06-15
2    2016-06-16
3    2016-06-12
3    2016-06-13
3    2016-06-14
3    2016-06-15
3    2016-06-16
4    2016-06-12
4    2016-06-13
4    2016-06-14
4    2016-06-15
4    2016-06-16
5    2016-06-12
5    2016-06-13
5    2016-06-14
5    2016-06-15
5    2016-06-16
6    2016-06-12
6    2016-06-13
6    2016-06-14
6    2016-06-15
```

Exercise 3:
Explain what's wrong in the following query, and provide a correct alternative:

```
SELECT Customers.custid, Customers.companyname, Orders.orderid, Orders.orderdate
FROM Sales.Customers AS C
  INNER JOIN Sales.Orders AS O
    ON Customers.custid = Orders.custid;
```

Exercise 4:
Return US customers, and for each customer return the total number of orders and total quantities: Tables involved: Sales.Customers, Sales.Orders, and Sales.OrderDetails
Desired output:

```
custid      numorders   totalqty
----------- ----------- -----------
32          11          345
36          5           122
43          2           20
45          4           181
48          8           134
55          10          603
65          18          1383
71          31          4958
75          9           327
77          4           46
78          3           59
82          3           89
89          14          1063
```

Exercise 5:
Return customers and their orders, including customers who placed no orders: Tables involved: Sales.Customers and Sales.Orders
Desired output (abbreviated):

3

```
custid        companyname       orderid       orderdate
-----------   ----------------  -----------   -----------
85            Customer ENQZT    10248         2014-07-04
79            Customer FAPSM    10249         2014-07-05
34            Customer IBVRG    10250         2014-07-08
84            Customer NRCSK    10251         2014-07-08
...
73            Customer JMIKW    11074         2016-05-06
68            Customer CCKOT    11075         2016-05-06
9             Customer RTXGC    11076         2016-05-06
65            Customer NYUHS    11077         2016-05-06
22            Customer DTDMN    NULL          NULL
57            Customer WVAXS    NULL          NULL

(832 row(s) affected)
```

Exercise 6:
Return customers who placed no orders: Tables involved: Sales.Customers and Sales.Orders
Desired output:

```
custid        companyname
-----------   ----------------
22            Customer DTDMN
57            Customer WVAXS

(2 row(s) affected)
```

Exercise 7:
Return customers with orders placed on February 12, 2016, along with their orders: Tables involved:
Sales.Customers and Sales.Orders
Desired output:

```
custid        companyname       orderid       orderdate
-----------   ----------------  -----------   ----------
48            Customer DVFMB    10883         2016-02-12
45            Customer QXPPT    10884         2016-02-12
76            Customer SFOGW    10885         2016-02-12

(3 row(s) affected)
```

Exercise 8:
Write a query that returns all customers in the output, but matches them with their respective orders only if
they were placed on February 12, 2016: Tables involved: Sales.Customers and Sales.Orders
Desired output (abbreviated):

```
custid      companyname       orderid     orderdate
----------- ----------------  ----------- ----------
72          Customer AHPOP    NULL        NULL
58          Customer AHXHT    NULL        NULL
25          Customer AZJED    NULL        NULL
18          Customer BSVAR    NULL        NULL
91          Customer CCFIZ    NULL        NULL
68          Customer CCKOT    NULL        NULL
49          Customer CQRAA    NULL        NULL
24          Customer CYZTN    NULL        NULL
22          Customer DTDMN    NULL        NULL
48          Customer DVFMB    10883       2016-02-12
10          Customer EEALV    NULL        NULL
40          Customer EFFTC    NULL        NULL
85          Customer ENQZT    NULL        NULL
82          Customer EYHKM    NULL        NULL
79          Customer FAPSM    NULL        NULL
...
51          Customer PVDZC    NULL        NULL
52          Customer PZNLA    NULL        NULL
56          Customer QNIVZ    NULL        NULL
8           Customer QUHWH    NULL        NULL
67          Customer QVEPD    NULL        NULL
45          Customer QXPPT    10884       2016-02-12
7           Customer QXVLA    NULL        NULL
60          Customer QZURI    NULL        NULL
19          Customer RFNQC    NULL        NULL
9           Customer RTXGC    NULL        NULL
76          Customer SFOGW    10885       2016-02-12
69          Customer SIUIH    NULL        NULL
86          Customer SNXOJ    NULL        NULL
88          Customer SRQVM    NULL        NULL
54          Customer TDKEG    NULL        NULL
```

Exercise 9:
Explain why the following query isn't a correct solution query for Exercise 8:

```
SELECT C.custid, C.companyname, O.orderid, O.orderdate
FROM Sales.Customers AS C
  LEFT OUTER JOIN Sales.Orders AS O
    ON O.custid = C.custid
WHERE O.orderdate = '20160212'
   OR O.orderid IS NULL;
```

Exercise 10 (optional, advanced):
Return all customers, and for each return a Yes/No value depending on whether the customer placed orders on February 12, 2016: Tables involved: Sales.Customers and Sales.Orders
Desired output (abbreviated):

```
custid       companyname      HasOrderOn20160212
-----------  ---------------  -------------------
...
40           Customer EFFTC   No
41           Customer XIIWM   No
42           Customer IAIJK   No
43           Customer UISOJ   No
44           Customer OXFRU   No
45           Customer QXPPT   Yes
46           Customer XPNIK   No
47           Customer PSQUZ   No
48           Customer DVFMB   Yes
49           Customer CQRAA   No
50           Customer JYPSC   No
51           Customer PVDZC   No
52           Customer PZNLA   No
53           Customer GCJSG   No
...

(91 row(s) affected)
```

Homework Questions:

Answer these queries in the context of Northwind schema.

1. Give the names of customers whose orders were delayed. Your answer should have the following schema.
    Customers(CustomerId, CustomerName)
2. Give the products details with its supplier company. Products(ProductName, SupplierName)
3. Give the name of top products which have highest sale in the year 1998.
4. Give the name of employees with its manager name. Schema should have the following schema. (EmployeeName, ManagerName)
5. Give the full names of managers who have less than two employees.
6. List all the products whose price is more than average price.
7. Find second highest priced product without using TOP statement
8. Are there any employees who are elder than their managers? List that names of those employees. Schema should look like this
    Employees(EmployeeName,ManagerName,EmployeeAge,ManagerAge)
9. List the names of products which were ordered on 8th August 1997.
10. List the names of suppliers whose supplied products were ordered in 1997.
11. How many employees are assigned to Eastern region. Give count.
12. Give the name of products which were not ordered in 1996.

Submission Instructions:

Make a document name DBLab3_2019_CE_X.sql, add supporting SQL scripts of your homework and submit on google classroom by Sunday, 6th February, 2022 9 P.M