Oracle MOOC: SQL Fundamentals

Week 3

Homework for Lesson 3

Homework is your chance to put what you've learned in this lesson into practice. This homework is not "graded" and you are encouraged to write additional code beyond what is asked.

Note:

- Ensure you completed the setup instructions provided on the course page, before attempting the homework.
- The solutions to the homework are NOT provided. We encourage you to try it out and discuss in the course forum for further learning.
- The homework is NOT mandatory to get the course completion award.
- Post your questions, comments, or suggestions (if any) in the course forum @ https://community.oracle.com/community/technology_network_community/moocs/sql-fundamentals-2018/week-3

Watch out for:

- Reference video that discussed the corresponding concept in this MOOC.
- Expected output.

Assignment 1

You have been hired as a SQL programmer for Acme Corporation. Your assignment is to create some reports based on data from the Human Resources tables.

1. Find the highest, lowest, sum, and average salary of all employees. Label the columns `Maximum`, `Minimum`, `Sum`, and `Average`, respectively. Round your results to the nearest whole number. Save your SQL statement as `hw3_task1_01.sql`. Run the query.

	Maximum	Minimum	Sum	Average
1	24000	2500	175508	8775

2. Modify the query in `hw3_task1_01.sql` to display the minimum, maximum, sum, and average salary for each job type. Save as `hw3_task1_02.sql` and run it.

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	JOB_ID	Maximum	Minimum	Sum	Average
1	IT_PROG	9000	4200	19200	6400
2	AC_MGR	12008	12008	12008	12008
3	AC_ACCOUNT	8300	8300	8300	8300
4	ST_MAN	5800	5800	5800	5800
5	AD_ASST	4400	4400	4400	4400
6	AD_VP	17000	17000	34000	17000
7	SA_MAN	10500	10500	10500	10500
8	MK_MAN	13000	13000	13000	13000
9	AD_PRES	24000	24000	24000	24000
10	SA_REP	11000	7000	26600	8867
11	MK_REP	6000	6000	6000	6000
12	ST_CLERK	3500	2500	11700	2925

3. Write a query to display the number of people with the same job. Generalize the query so that a user in the HR department is prompted for a job title. Save the script to a file named `hw3_task1_03.sql`. Run the query. Enter `IT_PROG` when prompted and view the result.

	JOB_ID	COUNT(*)
1	IT_PROG	3

4. Determine the number of managers without listing them. Label the column `Number of Managers`.

   Hint: Use the `MANAGER_ID` column to determine the number of managers

	Number of Managers
1	8

5. Find the difference between the highest and lowest salaries. Label the column `DIFFERENCE`.

	DIFFERENCE
1	21500

6. Create a report to display the manager number and the salary of the lowest-paid employee for that manager. Exclude anyone whose manager is not known. Exclude any groups where the minimum salary is $6,000 or less. Sort the output in descending order of salary.

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	MANAGER_ID	MIN(SALARY)
1	102	9000
2	205	8300
3	149	7000

7. Create a query to display the total number of employees and, of that total, the number of employees hired in 2009, 2010, 2011, and 2012. Create appropriate column headings.

	TOTAL	2009	2010	2011	2012
1	20	2	2	3	2

8. Create a matrix query to display the job, the salary for that job based on the department numbers 20, 50, 80, and 90, and the total salary for that job. Ensure to give each column an appropriate heading.

	Job	Dept 20	Dept 50	Dept 80	Dept 90	Total
1	IT_PROG	(null)	(null)	(null)	(null)	19200
2	AC_MGR	(null)	(null)	(null)	(null)	12008
3	AC_ACCOUNT	(null)	(null)	(null)	(null)	8300
4	ST_MAN	(null)	5800	(null)	(null)	5800
5	AD_ASST	(null)	(null)	(null)	(null)	4400
6	AD_VP	(null)	(null)	(null)	34000	34000
7	SA_MAN	(null)	(null)	10500	(null)	10500
8	MK_MAN	13000	(null)	(null)	(null)	13000
9	AD_PRES	(null)	(null)	(null)	24000	24000
10	SA_REP	(null)	(null)	19600	(null)	26600
11	MK_REP	6000	(null)	(null)	(null)	6000
12	ST_CLERK	(null)	11700	(null)	(null)	11700

See 3-2: Executing Group Functions for reference.

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Assignment 2

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	2012 Charade Rd	Seattle	Washington	United States of America
4	1800	460 Bloor St. W.	Toronto	Ontario	Canada
5	2500	Magdalen Centre, The Oxford Science Park	Oxford	Oxford	United Kingdom

2. The HR department needs a report of all employees with corresponding departments. Write a query to display the last name, department number, and department name for these 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
11	Lorentz	60	IT
12	Taylor	80	Sales
13	Zlotkey	80	Sales
14	Abel	80	Sales
15	De Haan	90	Executive
16	King	90	Executive
17	Kochhar	90	Executive
18	Higgins	110	Accounting
19	Gietz	110	Accounting

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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 names and employee numbers along with their managers' last names and manager numbers. Label the columns `Employee, Emp#, Manager` and `Mgr#` respectively. Save your SQL statement as `hw3_task2_04.sql`. Run the query.

	Employee	Emp#	Manager	Mgr#
1	Hunold	103	De Haan	102
2	Fay	202	Hartstein	201
3	Gietz	206	Higgins	205
4	Ernst	104	Hunold	103
5	Lorentz	107	Hunold	103
6	Kochhar	101	King	100
7	De Haan	102	King	100
8	Mourgos	124	King	100
9	Zlotkey	149	King	100
10	Hartstein	201	King	100
11	Whalen	200	Kochhar	101
12	Higgins	205	Kochhar	101
13	Rajs	141	Mourgos	124
14	Davies	142	Mourgos	124
15	Matos	143	Mourgos	124
16	Vargas	144	Mourgos	124
17	Abel	174	Zlotkey	149
18	Taylor	176	Zlotkey	149
19	Grant	178	Zlotkey	149

5. Modify `hw3_task2_04.sql` to display all employees, including King, who has no manager. Order the results by employee number. Save your SQL statement as `hw3_task2_05.sql`. Run the query in `hw3_task2_05.sql`.

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	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
11	Vargas	144	Mourgos	124
12	Zlotkey	149	King	100
13	Abel	174	Zlotkey	149
14	Taylor	176	Zlotkey	149
15	Grant	178	Zlotkey	149
16	Whalen	200	Kochhar	101
17	Hartstein	201	King	100
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 `hw3_task2_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

...

38	90	King	Kochhar
39	90	Kochhar	De Haan
40	90	Kochhar	King
41	110	Gietz	Higgins
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 query the structure of the `JOB_GRADES`

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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
```

	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	Hartstein	MK_MAN	Marketing	13000	D
5	Higgins	AC_MGR	Accounting	12008	D
6	Abel	SA_REP	Sales	11000	D
7	Zlotkey	SA_MAN	Sales	10500	D
8	Hunold	IT_PROG	IT	9000	C
9	Taylor	SA_REP	Sales	8600	C
10	Gietz	AC_ACCOUNT	Accounting	8300	C
11	Ernst	IT_PROG	IT	6000	C
12	Fay	MK_REP	Marketing	6000	C
13	Mourgos	ST_MAN	Shipping	5800	B
14	Whalen	AD_ASST	Administration	4400	B
15	Lorentz	IT_PROG	IT	4200	B
16	Rajs	ST_CLERK	Shipping	3500	B
17	Davies	ST_CLERK	Shipping	3100	B
18	Matos	ST_CLERK	Shipping	2600	A
19	Vargas	ST_CLERK	Shipping	2500	A

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

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	LAST_NAME	HIRE_DATE
1	Hunold	03-JAN-14
2	Ernst	21-MAY-15
3	Lorentz	07-FEB-15
4	Mourgos	16-NOV-15
5	Matos	15-MAR-14
6	Vargas	09-JUL-14
7	Zlotkey	29-JAN-16
8	Taylor	24-MAR-14
9	Grant	24-MAY-15
10	Fay	17-AUG-13

9. The HR department needs to find the names and hire dates of all employees who were hired before their managers, along with their managers' names and hire dates. Save the script to a file named `hw3_task2_09.sql`.

	LAST_NAME	HIRE_DATE	MANAGER	Manager_hire_date
1	Kochhar	21-SEP-09	King	17-JUN-11
2	De Haan	13-JAN-09	King	17-JUN-11
3	Rajs	17-OCT-11	Mourgos	16-NOV-15
4	Davies	29-JAN-13	Mourgos	16-NOV-15
5	Matos	15-MAR-14	Mourgos	16-NOV-15
6	Vargas	09-JUL-14	Mourgos	16-NOV-15
7	Abel	11-MAY-12	Zlotkey	29-JAN-16
8	Taylor	24-MAR-14	Zlotkey	29-JAN-16
9	Grant	24-MAY-15	Zlotkey	29-JAN-16

See 3-3: Retrieving Data from Multiple Tables – Part I and 3-4: Retrieving Data from Multiple Tables – Part II for reference.

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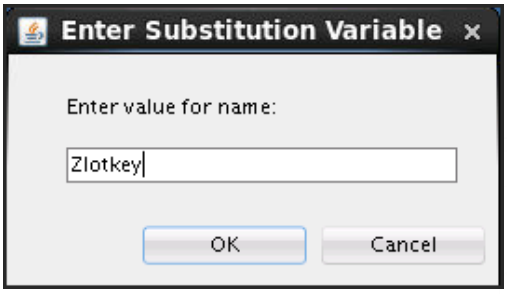
Assignment 3

1. The HR department needs a query that prompts the user for an employee's last name. The query then displays the last name and hire date of any employee in the same department as the employee whose name the user supplies (excluding that employee). For example, if the user enters `Zlotkey`, find all employees who work with Zlotkey (excluding Zlotkey).



	LAST_NAME	HIRE_DATE
1	Abel	11-MAY-12
2	Taylor	24-MAR-14

2. Create a report that displays the employee number, last name, and salary of all employees who earn more than the average salary. Sort the results in ascending order by salary.

SQL | All Rows Fetched: 8 in 0.005 secc

	EMPLOYEE_ID	LAST_NAME	SALARY
1	103	Hunold	9000
2	149	Zlotkey	10500
3	174	Abel	11000
4	205	Higgins	12008
5	201	Hartstein	13000
6	101	Kochhar	17000
7	102	De Haan	17000
8	100	King	24000

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3. Write a query that displays the employee number and last name of all employees who work in a department with any employee whose last name contains the letter "u." Save your SQL statement as `hw3_task3_03.sql`. Run your query.

	EMPLOYEE_ID	LAST_NAME
1	124	Mourgos
2	141	Rajs
3	142	Davies
4	143	Matos
5	144	Vargas
6	103	Hunold
7	104	Ernst
8	107	Lorentz

4. The HR department needs a report that displays the last name, department number, and job ID of all employees whose department location ID is 1700. Modify the query so that the user is prompted for a location ID. Save this to a file named `hw3_task3_04.sql`.

	LAST_NAME	DEPARTMENT_ID	JOB_ID
1	Whalen	10	AD_ASST
2	King	90	AD_PRES
3	Kochhar	90	AD_VP
4	De Haan	90	AD_VP
5	Higgins	110	AC_MGR
6	Gietz	110	AC_ACCOUNT

5. Create a report for HR that displays the last name and salary of every employee who reports to King.

	LAST_NAME	SALARY
1	Kochhar	17000
2	De Haan	17000
3	Mourgos	5800
4	Zlotkey	10500
5	Hartstein	13000

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6. Create a report for HR that displays the department number, last name, and job ID for every employee in the Executive department.

	DEPARTMENT_ID	LAST_NAME	JOB_ID
1	90	King	AD_PRES
2	90	Kochhar	AD_VP
3	90	De Haan	AD_VP

7. Create a report that displays a list of all employees whose salary is more than the salary of any employee from department 60.

	LAST_NAME
1	King
2	Kochhar
3	De Haan
4	Hartstein
5	Hunold
6	Higgins
7	Abel
8	Zlotkey
9	Taylor
10	Gietz
11	Grant
12	Fay
13	Ernst
14	Mourgos
15	Whalen

8. Modify the query in `hw3_task3_03.sql` to display the employee number, last name, and salary of all employees who earn more than the average salary, and who work in a department with any employee whose last name contains the letter "u." Save as `hw3_task3_08.sql`. Run the statement in `hw3_task3_08.sql`.

	EMPLOYEE_ID	LAST_NAME	SALARY
1	103	Hunold	9000

See 3-5: Nesting Queries and 3-6: Working with Advanced Subqueries for reference.

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Congratulations you have successfully completed homework for Week 3 of SQL Fundamentals.