AUT UNIVERSITY COMPUTER + MATHEMATICAL SCIENCES

COMP810 – Data Warehousing and Big Data

Lab 2: SQL Functions and Aggregating data using Group Functions

Model Answers

After completing this lesson, you should be` able to do the following:

- Limit the rows that are retrieved by a query
- Use of single row function e.g. character and date functions
- Use of group functions and group by clause
- Applying of conditions on group functions using having clause

Task: Use the HR database to create the following queries. Save your queries in a file (week2.sql) in a folder on your home drive.

1- Use SQL character functions to generate a report for staff names and full email address (email_ID@megacorp.com). The output should be formatted as following:

```
Full Name            Email
-------------------- -------------------------
ABEL, Ellen          eabel@megacorp.com
ANDE, Sundar         sande@megacorp.com
ATKINSON, Mozhe      matkinso@megacorp.com
```

Last Name First Name

```
select concat (upper (last_name) ||', ',first_name) "Full Name", lower (concat
(email,'@megacorp.com')) as "Email"
from employees
order by last_name;
```

2- Generate a report to display employees last names, basic salary with local currency as a prefix (e.g. NZD), commission percentage, and commission value (Salary * Commission %). If there is no commission value, the report should display “No Commission” message. The output should be alphabetically sorted with respect to last names as shown below:

```
LAST_NAME     Salary      Commission % Commission
------------ ---------- ------------ --------------------
Abel         NZD 11,000           .3                 3300
Ande         NZD  6,400           .1                  640
Atkinson     NZD  2,800            0       No Commission
Austin       NZD  4,800            0       No Commission
```

All work must be completed by the student. The teaching assistant may ask you to explain your code and results.

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```
select last_name, concat ('NZD',to_char (salary, '99,999')) as"Salary", nvl
(commission_pct, 0) as "Commission %", lpad (nvl (to_char(salary *
commission_pct),'No Commission'),20) as "Commission"

from employees

order by last_name;
```

3- Generate a report to display full name, length (number of characters) of full name, hire day and hire date for all staff members who earn a commission and do not hold the job title "SA_MAN". Rename the columns accordingly and format the report as following:

```
Full Name            Name Length      Hire Day  Hire Date
-------------------- ---------------- --------- --------------------
Peter Tucker         11 Char.         Thursday  January   30th 1997
David Bernstein      14 Char.         Monday    March     24th 1997
Peter Hall           9 Char.          Wednesday August    20th 1997
Christopher Olsen    16 Char.         Monday    March     30th 1998
```

```
select  first_name ||' '|| last_name as "Full Name",
        concat (length(concat(first_name, last_name)),' Char.') as "Name Length",
        to_char(hire_date, 'Day') as "Hire Day",
        to_char(hire_date, 'Month ddTH YYYY') as "Hire Date"
from employees
where commission_pct is not null
and job_id <> 'SA_MAN';
```

4- Generate a dynamic report to search for specific first name value and display the employee full name, job title, and full email address (email_ID@megacorp.com). The report should accept the end user input for first name value in any format (Uppercase, Lowercase, Mix-case). Rename the columns accordingly and format the report as following:

```
Full Name    Job Title  Email
------------ ---------- --------------------
Pat Fay      MK_REP     pfay@megacorp.com
```

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```
select first_name ||' '|| last_name as "Full Name", Job_id as "Job Title", concat
(lower (email),'@megacorp.com') as "Email"
from employees
where lower (first_name) = lower ('&First_Name');
```

5- Generate a report to display the minimum, maximum, average, and standard deviation for the salary attribute. Rename the column names accordingly. Also round both average and standard deviation columns to two decimal places.

```
select min (salary) as "Minimum", max (salary)"Maximum", round(avg
(salary),2)"Average", round(stddev (salary),2) "Standard Deviation"
from employees;
```

6- Generate a report to display a unique list of job titles from the employees table with number of employees for each job title. Sort the output by the number of employees in each job from highest to lowest. Format the report as following:

Job Title	Number of Staff
SA_REP	30
ST_CLERK	20
SH_CLERK	20
FI_ACCOUNT	5

```
select job_id as "Job Title", count (*) as "Number of Staff"
from employees
group by job_id
order by count (*) desc;
```

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7- Modify the report in question 5 to display the minimum, maximum, average, and standard deviation of salary for all employees in department 80. Round both average and standard deviation columns to two decimal places.

```
select min (salary) as "Minimum", max (salary)"Maximum", avg
(salary)"Average", stddev (salary) "Standard Deviation"
from employees
where department_id = 80;
```

8- Generate a report to calculate the average salary in each department (i.e. department name). The average salary must be rounded to 2 digits numbers according to the following format. Sort the output by the average salary values in descending order.

```
select e.department_id as "Department No", d.department_name as
"Department Name", round (avg(salary), 2) as "Average Salary"
from employees e, departments d
where e.department_id = d.DEPARTMENT_ID
group by e.department_id, d.DEPARTMENT_NAME
order by avg(salary) desc;
```

9- Modify the previous report to display the average salary in each department but only for departments who have average salary more than 6000.

```
select e.department_id as "Department No", d.department_name as
"Department Name", round (avg(salary), 2) as "Average Salary"
from employees e, departments d
where e.department_id = d.DEPARTMENT_ID
group by e.department_id, d.DEPARTMENT_NAME
having avg(salary) > 6000
order by avg(salary) desc;
```

All work must be completed by the student. The teaching assistant may ask you to explain your code and results.

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10- Generate a report to display staff full name, job title, department name, start date, end date and the number of months spent in that position. Rename the columns accordingly and format the report as following.

Full Name	Job Title	Department Name	Start Date	End Date	# Months in Position
Neena Kochhar	Public Accountant	Accounting	21/09/89	27/10/93	49
Neena Kochhar	Accounting Manager	Accounting	28/10/93	15/03/97	41
Lex De Haan	Programmer	IT	13/01/93	24/07/98	66
Den Raphaely	Stock Clerk	Shipping	24/03/98	31/12/99	21
Payam Kaufling	Stock Clerk	Shipping	01/01/99	31/12/99	12
Jonathon Taylor	Sales Representative	Sales	24/03/98	31/12/98	9
Jonathon Taylor	Sales Manager	Sales	01/01/99	31/12/99	12
Jennifer Whalen	Administration Assistant	Executive	17/09/87	17/06/93	69
Jennifer Whalen	Public Accountant	Executive	01/07/94	31/12/98	54
Michael Hartstein	Marketing Representative	Marketing	17/02/96	19/12/99	46

```
SELECT  e.first_name||' '||e.last_name as "Full Name",
        j.JOB_TITLE as "Job Title",
        d.department_name as "Department Name",
        jh.START_DATE as "Start Date",
        jh.END_DATE as "End Date",
        round (months_between (jh.end_date, jh.start_date)) as "# Months in Position"
from employees e, departments d, job_history jh, jobs j
where e.employee_id = jh.employee_id
AND jh.DEPARTMENT_ID = D.DEPARTMENT_ID
and j.JOB_ID = jh.JOB_ID
order by E.EMPLOYEE_ID, jh.START_DATE;
```

All work must be completed by the student. The teaching assistant may ask you to explain your code and results.