String Patterns, Sorting & Grouping

The practice problems will provide hands on experience with string patterns, sorting result sets and grouping result sets.

HR Database

We will be working on a sample HR database. This HR database schema consists of 5 tables called EMPLOYEES, JOB_HISTORY, JOBS, DEPARTMENTS and LOCATIONS. Each table has a few rows of sample data. The following diagram shows the tables for the HR database.

SAMPLE HR DATABASE TABLES

EMPLOYEES

EMP_ID	F_NAME	L_NAME	SSN	B_DATE	SEX	ADDRESS	JOB_ID	SALARY	MANAGER_ID	DEP_ID
E1001	John	Thomas	123456	1976-01-09	M	5631 Rice, OakPark,IL	100	100000	30001	2
E1002	Alice	James	123457	1972-07-31	F	980 Berry ln, Elgin,IL	200	80000	30002	5
E1003	Steve	Wells	123458	1980-08-10	M	291 Springs, Gary,IL	300	50000	30002	5

JOB_HISTORY

EMPL_ID	START_DATE	JOBS_ID	DEPT_ID
E1001	2000-01-30	100	2
E1002	2010-08-16	200	5
E1003	2016-08-10	300	5

JOBS

JOB_IDENT	JOB_TITLE	MIN_SALARY	MAX_SALARY
100	Sr. Architect	60000	100000
200	Sr.SoftwareDeveloper	60000	80000
300	Jr.SoftwareDeveloper	40000	60000

DEPARTMENTS

DEPT_ID_DEP	DEP_NAME	MANAGER_ID	LOC_ID
2	Architect Group	30001	L0001
5	Software Development	30002	L0002
7	Design Team	30003	L0003
5	Software	30004	L0004

LOCATIONS

LOCT_ID	DEP_ID_LOC
L0001	2
L0002	5
L0003	7

All these data is loaded through CSV files.

COMPOSING AND RUNNING QUERIES

Query 1:
Retrieve all employees whose address is in Elgin, IL.

Query 2:
Retrieve all employees who were born during the 1970's.

Query 3:
Retrieve all employees in department 5 whose salary is between 60000 and 70000.

Query 4:
Retrieve a list of employees ordered by department ID.

Query 5:
Retrieve a list of employees ordered in descending order by department ID and within each department ordered alphabetically in descending order by last name.

Query 6:
For each department ID retrieve the number of employees in the department.

Query 7:
For each department retrieve the number of employees in the department, and the average employees salary in the department.

Query 8:
In Query 7 order the result set by Average Salary.

Query 9:
In Query 8 limit the result to departments with fewer than 4 employees.

Query 10:
Similar to 4 but instead of department ID use department name. Retrieve a list of employees ordered by department name, and within each department ordered alphabetically in descending order by last name.

SOLUTIONS

Query 1: Output

```
1  -- Query 1------
2  ;
3  select F_NAME , L_NAME
4  from EMPLOYEES
5  where ADDRESS LIKE '%Elgin,IL%' ;
6  --Query 2--
7  ;
```

Saved scripts | Result

Filter by status: Result set | Log

All

Delete All

Al...

select...

select ...

select ...

F_NAME	L_NAME
Alice	James
Nancy	Allen
Ann	Jacob

Total rows: 3

Query 2: Output

RUN SQL

Run | Script | Edit | Favorites | New tab

```
6  --Query 2--
7  ;
8  select F_NAME , L_NAME
9  from EMPLOYEES
10 where B_DATE LIKE '197%' ;
11 ---Query3--
12 :
```

Saved scripts | Result

Filter by status: Result set | Log

All

Delete All

Al...

select ...

select...

select ...

select ...

F_NAME	L_NAME
John	Thomas
Alice	James
Nancy	Allen
Mary	Thomas

Total rows: 4

Query 3: Output

```
11  ---Query3--
12  ;
13  select *
14  from EMPLOYEES
15  where (SALARY BETWEEN 60000 and 70000)  and DEP_ID = 5 ;
16  --Query4--
17  ;
```

Saved scripts | Result

Filter by status: | Result set | Log

All

Delete All

All(5)...

select F_...

select F_...

select * f...

EMP_ID	F_NAME	L_NAME	SSN	B_DATE	SEX	ADDRESS	JOB_ID	SALARY	MANAGER_ID	DEP_ID
E1004	Santosh	Kumar	1234...	1985-07-20	M	511 Aurora ...	400	60000.00	30004	5
E1010	Ann	Jacob	12341...	1982-03-30	F	111 Britany ...	220	70000.00	30004	5

Total rows: 2

Query 4: Output

```
select F_NAME, L_NAME, DEP_ID
from EMPLOYEES
order by DEP_ID;
```

ed scripts | Result

r by status: | Result set | Log

All

elete All

(1)...

select F_...

(1)...

select F_...

(1)...

select F_...

(1)...

select F_...

F_NAME	L_NAME	DEP_ID
John	Thomas	2
Ahmed	Hussain	2
Nancy	Allen	2
Alice	James	5
Steve	Wells	5
Santosh	Kumar	5
Ann	Jacob	5
Mary	Thomas	7
Bharath	Gupta	7
Andrea	Jones	7

Total rows: 10

Query 5: Output

```
1  select F_NAME, L_NAME, DEP_ID
2  from EMPLOYEES
3  order by DEP_ID desc, L_NAME desc;
```

Saved scripts | Result

Filter by status: | Result set | Log

All

Delete All

All(1)... select F_...

All(1)... select F_...

All(1)... select F_...

All(1)... select F_...

All(1)...

F_NAME	L_NAME	DEP_ID
Mary	Thomas	7
Andrea	Jones	7
Bharath	Gupta	7
Steve	Wells	5
Santosh	Kumar	5
Alice	James	5
Ann	Jacob	5
John	Thomas	2
Ahmed	Hussain	2
Nancy	Allen	2

Total rows: 10

Query 6: Output

```
select DEP_ID, COUNT(*)
from EMPLOYEES
group by DEP_ID;
```

ved scripts | Result

er by status: | Result set | Log

All

lete All

select...

select ...

DEP_ID	2
2	3
5	4
7	3

Total rows: 3

Query 7: Output

```
1  select DEP_ID, COUNT(*), AVG(SALARY)
2  from EMPLOYEES
3  group by DEP_ID;
```

Saved scripts | Result

Filter by stat | Result set | Log

All

DEP_ID	2	3
2	3	86666.666666666666666666666666
5	4	65000.000000000000000000000000
7	3	66666.666666666666666666666666

Total rows: 3

Query 8: Output

```
select DEP_ID, COUNT(*) AS "NUM_EMPLOYEES", AVG(SALARY) AS "AVG_SALARY"
from EMPLOYEES
group by DEP_ID
order by AVG_SALARY;
```

ved scripts | Result

er by status: | Result set | Log

All

DEP_ID	NUM_EMPLOYEES	AVG_SALARY
5	4	65000.000000000000000000000000
7	3	66666.666666666666666666666666
2	3	86666.666666666666666666666666

Total rows: 3

Query 9: Output

```
select DEP_ID, COUNT(*) AS "NUM_EMPLOYEES", AVG(SALARY) AS "AVG_SALARY"
from EMPLOYEES
group by DEP_ID
having count(*) < 4
order by AVG_SALARY;
```

d scripts | Result

by status: | Result set | Log

Delete All

), F...

select DEP_...

elect DEP_I...

), F...

DEP_ID	NUM_EMPLOYEES	
7	3	66666.6666666
2	3	86666.6666666

Total rows: 2

Query 10: Output

```
16  --Query4--
17  ;
18  select D.DEP_NAME , E.F_NAME, E.L_NAME
19  from EMPLOYEES as E, DEPARTMENTS as D
20  where E.DEP_ID = D.DEPT_ID_DEP
21  order by D.DEP_NAME, E.L_NAME desc ;
22  --Query5--
```

Saved scripts | Result

Filter by status: | Result set | Log

All

Delete All

All(5)...

select F_...

select F_...

select * fr...

select D....

select DE...

DEP_NAME	F_NAME	L_NAME
Architect Group	John	Thomas
Architect Group	Ahmed	Hussain
Architect Group	Nancy	Allen
Design Team	Mary	Thomas
Design Team	Andrea	Jones
Design Team	Bharath	Gupta
Software Group	Steve	Wells
Software Group	Santosh	Kumar
Software Group	Alice	James
Software Group	Ann	Jacob

Total rows: 10