Trường Đại Học Quốc Tế - ĐHQG TP.HCM

LAB REPORT

Course: Principles Of Database Management LAB 4

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Basic Queries

1. **Query**: Write a query to list the names of all employees.

   SQL:

```
SELECT
  fname,
  minit,
  lname
FROM
  employee;
```

   Result set:

fname	minit	lname
John	B	Smith
Frank	T	Wong
Joyce	A	English
Ramesh	K	Narayan
James	E	Borg
Jennifer	S	Wallace
Ahmad	V	Jabbar
Alicia	J	Zelaya

2. **Query**: Write a query to list the names of all female employees.

   SQL:

```
SELECT
  fname,
  minit,
  lname
FROM
  employee
WHERE
  sex = 'F';
```

   Result set:

fname	minit	lname
Joyce	A	English
Jennifer	S	Wallace
Alicia	J	Zelaya

3. **Query**: Write a query to list the names of all employees along with their department names.

   SQL:

```
SELECT
  fname,
  minit,
  lname,
  dname
FROM
  employee,
  department
WHERE
  employee.dno = department.dnumber;
```

   Result set:

fname	minit	lname	dname
John	B	Smith	Research
Frank	T	Wong	Research
Joyce	A	English	Research
Ramesh	K	Narayan	Research
James	E	Borg	Headquarters
Jennifer	S	Wallace	Administration
Ahmad	V	Jabbar	Administration
Alicia	J	Zelaya	Administration

4. **Query**: Write a query to list the names of all departments along with their manager's social security number.

   SQL:

```
SELECT
  dname,
  mgrssn
FROM
  department;
```

   Result set:

dname	mgrssn
Headquarters	888665555
Administration	987654321
Research	333445555

Aggregate Functions

5. **Query**: Write a query to find the average salary of employees in each department.

   SQL:

```
SELECT
  dname,
  AVG(salary) AS avg_salary
FROM
  department,
  employee
WHERE
  department.dnumber = employee.dno
GROUP BY
  dname;
```

   Result set:

dname	avg_salary
Administration	31000.000000
Headquarters	55000.000000
Research	33250.000000

6. **Query**: Write a query to list the names of employees who don't work on any projects.

   SQL:

```
SELECT
  fname,
  minit,
  lname
FROM
  employee
WHERE
  ssn NOT IN (
    SELECT
      essn
    FROM
      works_on
    );
```

Result set:

fname	minit	lname

7. **Query**: Write a query to list the names of all employees and their dependents.

   SQL:

```
SELECT
  fname,
  minit,
  lname,
  dependent_name
FROM
  employee,
  dependent
WHERE
  ssn = essn;
```

   Result set:

fname	minit	lname	dependent_name
John	B	Smith	Alice
John	B	Smith	Elizabeth
John	B	Smith	Michael
Frank	T	Wong	Alice
Frank	T	Wong	Joy
Frank	T	Wong	Theodore
Jennifer	S	Wallace	Abner

8. **Query**: Write a query to list the names of employees who are also managers of departments.

   SQL:

```
SELECT
  fname,
  minit,
  lname
FROM
  employee,
  department
WHERE
  ssn = mgrssn;
```

   Result set:

fname	minit	lname
James	E	Borg
Jennifer	S	Wallace
Frank	T	Wong

9. **Query**: Write a query to find the names of all employees who work on every project.

   SQL:

```
SELECT
  fname,
  minit,
  lname
FROM
  employee AS e
WHERE
  NOT EXISTS (
    SELECT
      pnumber
    FROM
      project AS p
    WHERE
      NOT EXISTS (
        SELECT
          w.essn
        FROM
          works_on AS w
        WHERE
          w.essn = e.ssn AND
          w.pno = p.pnumber
      )
  );
```

   Result set:

fname	minit	lname

10. **Query**: Write a query to find the names of employees with the same supervisor as the employee with social security number '123456789'.

SQL:

```
SELECT
  fname,
  minit,
  lname
FROM
  employee
WHERE
  superssn IN (
    SELECT
      superssn
    FROM
      employee
    WHERE
      ssn = '123456789'
  );
```

Result set:

fname	minit	lname
John	B	Smith
Joyce	A	English
Ramesh	K	Narayan

Complex Queries

11. **Query**: Write a query to retrieve the names of all employees in department 5 who work more than 10 hours per week on the 'ProductX' project.

    SQL:

```
SELECT
  fname,
  minit,
  lname
FROM
  employee
WHERE
```

```
8     dno IN (
9       SELECT
10        dnumber
11      FROM
12        department
13      WHERE
14        dnumber = 5
15      )
16      AND ssn IN (
17        SELECT
18          essn
19        FROM
20          works_on
21        WHERE
22          hours > 10
23        AND pno IN (
24          SELECT
25            pno
26          FROM
27            project
28          WHERE
29            pname = 'ProductX'
30        )
31      );
```

Result set:

```
fname           minit lname
--------------- ----- ---------------
John            B     Smith
Joyce           A     English
Ramesh          K     Narayan
```

12. **Query**: Write a query to list the names of all employees who have a dependent with the same first name as themselves.

    SQL:

```
1  SELECT
2    e.fname,
3    e.minit,
```

```
4     e.lname
5   FROM
6     employee AS e
7   INNER JOIN dependent AS d ON e.ssn = d.essn
8   WHERE
9     e.fname = d.dependent_name;
```

Result set:

```
fname           minit lname
--------------- ----- ---------------
```

13. **Query**: Write a query to find the names of all employees who are directly supervised by 'Franklin Wong'.

    SQL:

```
1   SELECT
2     fname,
3     minit,
4     lname
5   FROM
6     employee
7   WHERE superssn IN (
8     SELECT
9       ssn
10    FROM
11      employee
12    WHERE
13      fname = 'Frank'
14      AND lname = 'Wong'
15    );
```

    Result set:

```
fname           minit lname
--------------- ----- ---------------
John            B     Smith
Joyce           A     English
Ramesh          K     Narayan
```

14. **Query**: Write a query to list, for each project, the project name and the total hours per week spent on that project by all employees.

SQL:

```
SELECT
  pname,
  SUM(hours) AS total_hours
FROM works_on INNER JOIN works_on ON project.pnumber = works_on.pno
GROUP BY
  pname;
```

Result set:

pname	total_hours
Computerization	55.0
Newbenefits	55.0
ProductX	52.5
ProductY	37.5
ProductZ	50.0
Reorganization	25.0

15. **Query**: Write a query to retrieve the names of all employees who work on every project.

SQL:

```
SELECT
  fname,
  minit,
  lname
FROM
  employee AS e
WHERE
  NOT EXISTS (
    SELECT
      pnumber
    FROM
      project AS p
    WHERE
      NOT EXISTS (
        SELECT
          w.essn
        FROM
          works_on AS w
```

```
19          WHERE
20            w.essn = e.ssn AND
21            w.pno = p.pnumber
22        )
23    );
```

Result set:

```
fname           minit lname
--------------- ----- ---------------
```

16. **Query**: Write a query to list the names of employees who do not work on any projects.

    SQL:

```
1  SELECT
2    fname,
3    minit,
4    lname
5  FROM
6    employee
7  WHERE
8    ssn NOT IN (
9      SELECT
10       essn
11     FROM
12       works_on
13     );
```

Result set:

```
fname           minit lname
--------------- ----- ---------------
```

Advanced Queries

17. **Query**: Write a query to retrieve the average salary of all female employees.

    SQL:

```
1  SELECT
```

```
2    fname,
3    minit,
4    lname,
5    AVG(salary)
6  FROM
7    employee
8  WHERE
9    sex = 'F'
10 GROUP BY
11   fname,
12   minit,
13   lname
```

Result set:

```
fname          minit lname          avg_salary_female
-------------- ----- -------------- ------------------
Alicia         J     Zelaya         25000.000000
Jennifer       S     Wallace        43000.000000
Joyce          A     English        25000.000000
```

18. **Query**: Write a query to find the names and addresses of all employees who work on at least one project located in Houston but whose department has no location in Houston.

    SQL:

```
1  SELECT
2    fname,
3    minit,
4    lname,
5    address
6  FROM
7    employee
8  WHERE
9    ssn IN (
10     SELECT
11       essn
12     FROM
13       works_on
14     WHERE
15       pno IN (
16         SELECT
```

```
17            pnumber
18          FROM
19            project
20          WHERE
21            plocation = 'Houston'
22        )
23    )
24  AND dno NOT IN (
25    SELECT
26      dnumber
27    FROM
28      dept_locations
29    WHERE
30      dlocation = 'Houston'
31  );
```

Result set:

fname	minit	lname	address
Jennifer	S	Wallace	Bellaire,TX

19. **Query**: Write a query to list the last names of all department managers who have no dependents.

    SQL:

```
1  SELECT
2    lname
3  FROM
4    employee,
5    department
6  WHERE
7    ssn = mgrssn
8    AND ssn NOT IN (
9      SELECT
10       essn
11     FROM
12       dependent
13   )
```

Result set:

```
lname
---------------

Borg
```

20. **Query**: Write a query to retrieve, for each department whose average employee salary is more than 30000, the department name and the number of employees working for that department.

    SQL:

```
SELECT
  dname,
  COUNT(ssn)
FROM
  employee INNER JOIN department ON employee.dno = department.dnumber
GROUP BY
  dname
HAVING
  AVG(salary) > 30000
```

    Result set:

dname	num_employee
Administration	3
Headquarters	1
Research	4

This is the end of the report