2019320097_조이강

데이터베이스실습-03

Exercise 1

Based on the university schema, write the following queries in SQL.

a. Execute ‘select * from instructor;’ and ‘select * from course;’

```
chapter3=# select * from instructor;
  id   |    name    | dept_name  |  salary
-------+------------+------------+----------
 10101 | Srinivasan | Comp. Sci. | 65000.00
 13434 | Smith      | Chemistry  | 57000.00
 12121 | Wu         | Finance    | 90000.00
 15151 | Mozart     | Music      | 40000.00
 22222 | Einstein   | Physics    | 95000.00
 32343 | El Said    | History    | 60000.00
 33456 | Gold       | Physics    | 87000.00
 45565 | Katz       | Comp. Sci. | 75000.00
 58583 | Califieri  | History    | 62000.00
 76543 | Singh      | Finance    | 80000.00
 76766 | Crick      | Biology    | 72000.00
 83821 | Brandt     | Comp. Sci. | 92000.00
 89374 | Karl       | Chemistry  | 68000.00
 98345 | Kim        | Elec. Eng. | 80000.00
(14개 행)
```

```
chapter3=# select * from course;
 course_id |           title            | dept_name  | credits
-----------+----------------------------+------------+---------
 BIO-101   | Intro. to Biology          | Biology    |       4
 BIO-301   | Genetics                   | Biology    |       4
 BIO-399   | Computational Biology      | Biology    |       3
 CS-101    | Intro. to Computer Science | Comp. Sci. |       4
 CS-190    | Game Design                | Comp. Sci. |       4
 CS-315    | Robotics                   | Comp. Sci. |       3
 CS-319    | Image Processing           | Comp. Sci. |       3
 CS-347    | Database System Concepts   | Comp. Sci. |       3
 EE-181    | Intro. to Digital Systems  | Elec. Eng. |       3
 FIN-201   | Investment Banking         | Finance    |       3
 HIS-351   | World History              | History    |       3
 MU-199    | Music Video Production     | Music      |       3
 PHY-101   | Physical Principles        | Physics    |       4
(13개 행)
```

b. Increase the salary of each instructor in the Comp. Sci. department by 10%.

```
chapter3=# update instructor
chapter3-# set salary = salary * 1.10
chapter3-# where dept_name = 'Comp. Sci.';
UPDATE 3
```

c. Delete all courses that have never been offered (i.e., do not occur in the section relation).

```
chapter3=# delete from course
chapter3-# where course_id not in
chapter3-# (select course_id
chapter3(# from section);
DELETE 1
```

d. Insert every student whose tot_cred attribute is greater than 100 as an instructor in the same department, with a salary of $10,000.

```
chapter3=# insert into instructor
chapter3-# select id, name, dept_name, 10000
chapter3-# from student
chapter3-# where tot_cred > 100;
INSERT 0 3
```

e. Execute ‘select * from instructor;’ and ‘select * from course;’

```
chapter3=# select * from instructor;
  id   |    name    | dept_name  |  salary
-------+------------+------------+-----------
 13434 | Smith      | Chemistry  |  57000.00
 12121 | Wu         | Finance    |  90000.00
 15151 | Mozart     | Music      |  40000.00
 22222 | Einstein   | Physics    |  95000.00
 32343 | El Said    | History    |  60000.00
 33456 | Gold       | Physics    |  87000.00
 58583 | Califieri  | History    |  62000.00
 76543 | Singh      | Finance    |  80000.00
 76766 | Crick      | Biology    |  72000.00
 89374 | Karl       | Chemistry  |  68000.00
 98345 | Kim        | Elec. Eng. |  80000.00
 10101 | Srinivasan | Comp. Sci. |  71500.00
 45565 | Katz       | Comp. Sci. |  82500.00
 83821 | Brandt     | Comp. Sci. | 101200.00
 00128 | Zhang      | Comp. Sci. |  10000.00
 23121 | Chavez     | Finance    |  10000.00
 98988 | Tanaka     | Biology    |  10000.00
(17개 행)
```

```
chapter3=# select * from course;
 course_id |           title            | dept_name  | credits
-----------+----------------------------+------------+---------
 BIO-101   | Intro. to Biology          | Biology    |       4
 BIO-301   | Genetics                   | Biology    |       4
 CS-101    | Intro. to Computer Science | Comp. Sci. |       4
 CS-190    | Game Design                | Comp. Sci. |       4
 CS-315    | Robotics                   | Comp. Sci. |       3
 CS-319    | Image Processing           | Comp. Sci. |       3
 CS-347    | Database System Concepts   | Comp. Sci. |       3
 EE-181    | Intro. to Digital Systems  | Elec. Eng. |       3
 FIN-201   | Investment Banking         | Finance    |       3
 HIS-351   | World History              | History    |       3
 MU-199    | Music Video Production     | Music      |       3
 PHY-101   | Physical Principles        | Physics    |       4
(12개 행)
```

Exercise 2

▪ Consider the relational database in the below, where the primary keys are underlined. Give an expression in SQL for each of the following queries.

a. Find the ID of each employee who does not work for “First Bank Corporation”.

```
chapter3=# select id
chapter3-# from works
chapter3-# where company_name<>'First Bank Corporation';
  id
-------
 11111
 33333
 44444
 55555
 66666
 88888
 99999
 00000
 54321
(9개 행)
```

b. Find the ID of each employee who earns more than every employee of “Small Bank Corporation”.

```
chapter3=# select id
chapter3-# from works
chapter3-# where salary >
chapter3-# (select max(salary)
chapter3(# from works
chapter3(# where company_name = 'Small Bank Corporation');
  id
-------
 11111
 22222
 33333
 44444
 55555
 99999
 54321
(7개 행)
```

c. Find the name of the company that has the most employees (or companies, in the case where there is a tie for the most).

```
chapter3=# with counts as (
chapter3(# select company_name, count(company_name)
chapter3(# from works
chapter3(# group by company_name
chapter3(# )
chapter3-# select company_name
chapter3-# from counts
chapter3-# where counts.count = (
chapter3(# select max(count)
chapter3(# from counts)
chapter3-# ;
     company_name
----------------------
 Big Bank Corporation
(1개 행)
```

d. Find the name of the company that has branches in all cities where “Small Bank Corporation” is located; make sure there are no duplicates in the result.

(“Small Bank Corporation” may be included in the result.)

```
chapter3=# select distinct company_name
chapter3-# from company c
chapter3-# where not exists (
chapter3(# (select city
chapter3(# from company
chapter3(# where company_name = 'Small Bank Corporation')
chapter3(# except
chapter3(# (select city
chapter3(# from company
chapter3(# where company_name = c.company_name)
chapter3(# )
chapter3-# ;
      company_name
-----------------------
 First Bank Corporation
 Small Bank Corporation
(2개 행)
```

e. Find the city where the company, the answer to the problem above, exists, but “Small Bank Corporation” doesn’t.

```
chapter3=# with coms as (
chapter3(# select distinct company_name
chapter3(# from company c
chapter3(# where not exists (
chapter3(# (select city
chapter3(# from company
chapter3(# where company_name = 'Small Bank Corporation')
chapter3(# except
chapter3(# (select city
chapter3(# from company
chapter3(# where company_name = c.company_name)
chapter3(# )
chapter3(# )
chapter3-# (select city
chapter3(# from company t, coms
chapter3(# where t.company_name = coms.company_name)
chapter3-# except
chapter3-# (select city
chapter3(# from company
chapter3(# where company_name = 'Small Bank Corporation');
   city
-----------
 Horseneck
(1개 행)
```

Exercise 2

▪ Consider the relational database in the below, where the primary keys are underlined. Give an expression in SQL for each of the following queries.

f. Increase the salary of each employee in the company whose employees earn a lower salary, on average, than the average salary at “Second Bank Corporation” by 20%.

1. Execute 'select * from works;’.

```
chapter3=# select * from works;
  id   |      company_name       |   city    | salary
-------+-------------------------+-----------+--------
 12345 | First Bank Corporation  | Brooklyn  |  11000
 11111 | Second Bank Corporation | Palo Alto |  12000
 22222 | First Bank Corporation  | Brooklyn  |  22000
 33333 | Big Bank Corporation    | Horseneck | 200000
 44444 | Second Bank Corporation | Palo Alto |  23000
 55555 | Big Bank Corporation    | Horseneck | 120000
 66666 | Small Bank Corporation  | Brooklyn  |   9500
 77777 | First Bank Corporation  | Palo Alto |   8000
 88888 | Second Bank Corporation | Palo Alto |  10000
 99999 | Big Bank Corporation    | Horseneck | 110000
 00000 | Small Bank Corporation  | Palo Alto |  11000
 54321 | Big Bank Corporation    | Horseneck |  90000
(12개 행)
```

2. Find the name of each company whose employees earn a lower salary, on average, than the average salary at “Second Bank Corporation”.

```
chapter3=# select person_name
chapter3-# from employee e, works w
chapter3-# where e.id = w.id and w.company_name in
chapter3-# (select company_name
chapter3(# from works
chapter3(# group by company_name
chapter3(# having avg(salary) <
chapter3(# (select avg(salary)
chapter3(# from works
chapter3(# where company_name = 'Second Bank Corporation')
chapter3(# )
chapter3-# ;
 person_name
-------------
 Adams
 Curry
 Johnson
 Jones
 Turner
(5개 행)
```

3. Solve the problem.

```
chapter3=# update works
chapter3-# set salary = salary * 1.20
chapter3-# where id in (
chapter3(# select w.id
chapter3(# from employee e, works w
chapter3(# where e.id = w.id and w.company_name in
chapter3(# (select company_name
chapter3(# from works
chapter3(# group by company_name
chapter3(# having avg(salary) <
chapter3(# (select avg(salary)
chapter3(# from works
chapter3(# where company_name = 'Second Bank Corporation')
chapter3(# )
chapter3(# )
chapter3-# ;
UPDATE 5
```

4. Execute 'select * from works;'.

```
chapter3=# select * from works;
  id   |      company_name       |   city    | salary
-------+-------------------------+-----------+--------
 11111 | Second Bank Corporation | Palo Alto |  12000
 33333 | Big Bank Corporation    | Horseneck | 200000
 44444 | Second Bank Corporation | Palo Alto |  23000
 55555 | Big Bank Corporation    | Horseneck | 120000
 88888 | Second Bank Corporation | Palo Alto |  10000
 99999 | Big Bank Corporation    | Horseneck | 110000
 54321 | Big Bank Corporation    | Horseneck |  90000
 12345 | First Bank Corporation  | Brooklyn  |  13200
 22222 | First Bank Corporation  | Brooklyn  |  26400
 66666 | Small Bank Corporation  | Brooklyn  |  11400
 77777 | First Bank Corporation  | Palo Alto |   9600
 00000 | Small Bank Corporation  | Palo Alto |  13200
(12개 행)
```