DB개론 Project5 (DeadLine 5월 16일 낮12시, 50점 만점) 조번호( )

1번 8점

Figure 2.35

employee (*person-name*, *street*, *city*)
works (*person-name*, *company-name*, *salary*)
company (*company-name*, *city*)
manages (*person-name*, *manager-name*)

Consider the relational database of Figure 2.35, where the primary keys are underlined. Give an expression in the relational algebra to express each of the following queries:

a. Find the names of all employees who work for First Bank Corporation.

b. Find the names and cities of residence of all employees who work for First Bank Corporation.

c. Find the names, street address, and cities of residence of all employees who work for First Bank Corporation and earn more than $10,000 per annum.

d. Find the names of all employees in this database who live in the same city as the company for which they work.

e. Assume the companies may be located in several cities. Find all companies located in every city in which Small Bank Corporation is located.

2번 8점

Consider the following relational schema

employee(*empno*, *name*, *office*, *age*)
books(*isbn*, *title*, *authors*, *publisher*)
loan(*empno*, *isbn*, *date*)

Write the following queries in relational algebra.

a. Find the names of employees who have borrowed a book published by McGraw-Hill.
b. Find the names of employees who have borrowed all books published by McGraw-Hill.
c. Find the names of employees who have borrowed more than five different books published by McGraw-Hill.
d. For each publisher, find the names of employees who have borrowed more than five books of that publisher.

3번 4점

Let R = (A, B, C), and let r_1 and r_2 both be relations on schema R. Give an expression in SQL that is equivalent to each of the following queries.

a. $r_1 \cup r_2$

b. $r_1 \cap r_2$

c. $r_1 - r_2$

d. $\pi_{AB}(r_1) \bowtie \pi_{BC}(r_2)$

4번 4점

Consider an employee database with two relations

employee(employee-name, street, city)
works(employee-name, company-name, salary)

where the primary keys are underlined. Write a query to find companies whose employees earn a higher salary, on average, than the average salary at First Bank Corporation.

a. Using SQL functions as appropriate.
b. Without using SQL functions.

5번 6점

- Figure 5.14

emplyee(person_name, street, city)

works(person_name, company_name, salary)

company(company_name, city)

managers(person_name, manager_name)

Consider the employee database of Figure 5.14. Give expressions in tuple rela-tional calculus and domain relational calculus for each of the following queries:

a. Find the names of all employees who work for First Bank Corporation

b. Find the names and cities of residence of all employees who work for First Bank Corporation

6번 7점

Let $R = (A, B, C)$, and let r_1 and r_2 both be relations on schema R. Give an expression in the domain relational calculus that is equivalent to each of the following:

a. $\Pi_A(r_1)$

b. $\sigma_{B=17}(r_1)$

c. $r_1 \cup r_2$

d. $r_1 \cap r_2$

e. $r_1 - r_2$

f. $\Pi_{A,B}(r_1) \bowtie \Pi_{B,C}(r_2)$

7번 8점

A. Describe four common features in JDBC and ODBC in detail

B. Write benefits and drawbacks of external language functions/ procedures in detail

8번 5점

Describe why E.F. Codd's accomplishment is great