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Assignment 2

DBMS

- 1, Consider relational db of figure below, where the primary keys are underlined. Give an expression in the relational algebra to express each of following queries

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

- a) Find the names of all employee who work for first Bank Corporation

→ Π person-name (σ company-name = "first Bank Corporation" (works))

- b) Find the names and cities of residence of all employee who work for 1st Bank Corp.

→ Π person-name (σ company-name = "first Bank Corp" (works \bowtie Employee))

- c) Find the name, street address & cities of residence of all employee who works for 1st Bank Corp. & who earn more than \$10,000 per annum

→ Π person-name, street, city (σ company-name = "1st Bank Corp" \wedge σ salary > \$10,000 (Employee))

employee)
salary

d) Find the names of all employee in this db who live in same city as the company for which they work.

→ Π person-name ($\sigma_{\text{city} = \text{employee.city} = \text{company.city}}$ (w empl-
-oyee \bowtie works \bowtie company))

e) Modify the db so that Jones now lives in Newtown

→ Employee $\leftarrow \Pi$ person-name, street, city = "Newtown" ($\sigma_{\text{person-name} = \text{"Jones"}}(\text{Employee}) \cup (\text{Employee} - \sigma_{\text{person-name} = \text{"Jones"}}(\text{Employee}))$)

f) Give all employee of 1st Bank Corpⁿ a 10% salary raise.

→ Works $\leftarrow \Pi$ person-name, comp-name, salary

→ Works $\leftarrow (\text{Works} \cup (\Pi \text{ person-name, "1st Bank Corp"}))$
Salary $\times 1.1$ ($\sigma_{\text{comp-name} = \text{"1st Bank Corp"}}(\text{Works})$)
($\sigma_{\text{comp-name} = \text{"1st Bank Corporation"}}(\text{Works})$)

h) Find the names of all employees in this db who don't work for 1st Bank Corporation

→ Π person-name ($\sigma_{\text{company-name} < \text{"1st Bank Corporation"}}(\text{Works})$)

g) Delete all tuples in the works relation for employee of small Bank Corporation

↳ $Works \leftarrow Works - \sigma_{company-name = 'Small Bank Corp'}(Works)$

i) find name of all employee in db who don't work for first bank corporation

↳ $\Pi_{company-name} (Company \bowtie (\sigma_{company-count \neq 1}(company-name, count(Person-name)(Works \bowtie employee))))$

j) Find the company with most employee

↳ $\Pi_{person-name}$

→ $\Pi_{company-name} (\sigma_{person-name \cdot count} (Works \bowtie employee))$

2) Consider the following relations:

Doctor (SSN , firstName, LastName, Speciality, YearsOfExperience, phone Num)

Patient (SSN , firstName, LastName, Add^r, DOB, PrimaryDoctor-SSN)

Medicine (TradeName, UnitPrice, GenericFlag)

Prescription (Id, Date, Doctor-SSN, Patient-SSN)

Prescription-Medicine (Prescription Id, Trade Name, Num of Units)

a) list the trade name of generic medicine with unit price less than \$50

GenericFlag = 1

→ Π tradename ($\sigma_{UnitPrice < \$50} (Medicine)$)

b) list the 1st & last name of patient whose primary doctor named 'John Smith'

→ Π 1st name, lastname (Patient \bowtie (Π SSN (Doctor \bowtie (firstName = 'John' \wedge LastName = 'Smith') (Doctor))))

c) list the 1st & last name of doctor who aren't primary doctor to any patient.

→ Π 1st name, lastname ((Doctor - Π primary doctor-SSN) (Patient \bowtie Doctor))

d) For medicine written in more than 20 prescriptions, report the trade name & the total no. of units prescrib

-be

c) Π tradename, Num of units (Prescription_Medicine \bowtie (Π tradename)
(Prescription) \bowtie (δ count (Prescription-Id > 20) (Prescription-
medicine)))

e, list the SSN of patient of who've 'Aspirin' &
'Vitamin' trade name in one 'prescription'.

c) Π patient-SSN ($(\delta$ tradename = "aspirin") (Prescription-medicine)
 \bowtie (δ tradename = "Vitamin") (Prescription-medicine))

f) list the ~~only~~ first & last name of patient who have
no prescription written by doctor other than their
primary doctors.

g) Π first-name, last-name (Patient (Π patient-SSN) (δ doctor-SSN
<> Primary doctor-SSN) (Prescription) \bowtie Patient))