CMPT 354 Assignment 2

Junchen Li

301385486

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Part 1 -  A Professorial ERD to Tables

CREATE TABLE Research paper (

title CHAR (40),

field CHAR (10),

employeeID CHAR (9),

billing INTEGER,

FOREIGN KEY (employeeID) REFERENCES Professor

PRIMARY KEY (title) )

CREATE TABLE Professor (

employeeID CHAR (9),

name CHAR (40 ) NOT NULL,

tenureDeadline DATETIME,

biling INTEGER,

title CHAR (40),

FOREIGN KEY (title) REFERENCES Research paper

PRIMARY KEY(employeeID) )

CREATE TABLE conference (

conYear INTEGER,

conName CHAR (40),

attendance INTEGER,

location CHAR (40),

title CHAR (40),

employeeID CHAR (9),

FOREIGN KEY (employeeID) REFERENCES Professor

FOREIGN KEY (title) REFERENCES Research paper

PRIMARY KEY ((conYear, conName) )

CREATE TABLE Course(

course Number INTEGER,

department CHAR (4),

termID CHAR (9),

capacity INTEGER,

year INTEGER,

pay REAL,

employeeID CHAR (9),

studentID CHAR (9),

FOREIGN KEY (employeeID) REFERENCES Professor

FOREIGN KEY (studentID) REFERENCES TA

PRIMARY KEY((course Number, department, termID) ) )

CREATE TABLE TA(

studentID CHAR (9),

name CHAR (40) NOT NULL,

pay REAL,

course Number INTEGER,

department CHAR (4),

termID CHAR (9),

FOREIGN KEY ((course Number, department, termID) ) REFERENCES Course

PRIMARY KEY (studentID) )

CREATE TABLE Grade(

email CHAR (20),

studentName CHAR (40),

finalGrade CHAR (2),

course Number INTEGER,

department CHAR (4)

termID CHAR (9)

CONSTRAINT unique\_email UNIQUE (email),

FOREIGN KEY((course Number, department, termID) ) REFERENCES Course ON DELETE CASCADE,

PRIMARY KEY (email) )

## Part 2 - Relational Algebra Queries

1. firstName, lastName ( birthDate < 1994. 5. 1 income (customer) >=94000)
2. customer ID, lastName, birthDate (( budget > 2300000 Account.accNumber = owns.accNumber customer.customerID = owns.customerID (customer x Owns x Account))
3. SIN, firstName, lastName, startDate ( Branch.managerSIN = PersonalBanker.SIN(Employee  PersonalBanker x Branch))
4. customerID, accNumber ( Owns.accNumber = temp.accNumber Owns.SIN != temo.SIN(Owns temp(Owns))
5. Employee.SIN, Employee.salary ( Employee.salary > manager.salary employee.branchNumber = manager.branchNumber ( Employee x (Employee Employee.SIN = Branch.managerSIN(Branch Employee))))
6. branchName (Branch.branchNumber = Employee.branchNumber ( Employee.lastName = “Carson” ( lastName, branchName (Employee) Employee.lastName = “Wilson” ( lastName, branchName (Employee Branch) ))))
7. firstName, lastName, birthdate (branchName = “Lonsdale” (Customer Owns Account Branch) firstName, lastName, StartDate ( branchName = “Lonsdale” (Employee x Branch)))
8. customerID, birthDate (branchName = “Kitsilano” Employee.branchNumber = Branch.branchNumber PersonalBanker.customerID = Customer.customerID PersonalBanker.SIN = Employee.SIN(Employee Branch PersonalBanker Customer) customerID, birthDate ( branchName = “Marine” Employee.branchNumber = Branch.branchNumber PersonalBanker.SIN = Employee.SIN(Employee Branch PersonalBanker Customer) )
9. customerID (Owns) –  customerID ( amount 20000 amount -20000 (Owns Transactions))
10. customerID, customer.incomes ( type = “chequing” Customer.customerID = Owns.customerID Account.accNumber = Own.accNumber (Customer x Account x Owns) || type = “saving”  Customer.customerID = Own.customerID Account.accNumber = Owns.accNumber(Customer x Account x Owns))
11. SIN, firstName, lastName ( Customer.firstName = Employee.firstName Customer.lastName = Employee.lastName Branch.branchNumber = Employee.branchNumber (Customer  Employee Branch )

Answer: No this query can not exactly match the desired data because of there would be some people who have the same name however, they can have different SINs number.

1. {T.firstName, T.lastName | T (Customer T.birthDate < 1994.5.1 T.income > 94000) }
2. {J.SIN, J.firstName, J.lastName, J.startDate | j PersonalBanker (S,SIN = j.SIN) k Branch(k.managerSIN = j.SIN) }