

CS315 Quiz 2

Marks = 20

28th January, 2019

bed + 58201

11 HRT

There are 4 questions in 1 page. Answer in the question paper itself and return.
Considering the following schema for a banking system, write relational algebra queries:
branch(bcode, bname, city, assets) customer(cid, cname, city)
account(ano, bcode, balance) depositor(cid, ano)
loan(lno, bcode, amount) borrower(cid, lno)

Q1: [5 marks] Find names of customers who have at least one account in a different city.

$$\leftarrow \pi_{cid, city} \left(\left(\pi_{cid, bcode} (account \bowtie depositor) \right) \bowtie_{bcode} branch \right)$$

$$cname \left(\pi_{city \neq cust-city} (customer \bowtie (\pi_{cid, city} (id-city))) \right)$$

Step 1
Step 2

Q2: [5 marks] Find ids of customers who have accounts at all branches of "Kanpur" city.

$$\pi_{name} (customer \bowtie (\pi_{cid} (\sigma_{city=kanpur} (\pi_{ano, bcode, city} (account \bowtie branch))))$$

Step 1
Step 2

Q3: [5 marks] Find code and name of the branch having the highest average account balance per customer.

$$\leftarrow \pi_{bcode, cid} \left(\arg(balanc) (customer \bowtie (depositor \bowtie (account \bowtie branch))) \right)$$

Step 1
Step 2

Q4: [5 marks] Find ids of customers who have either an account or a loan but not both.

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CS315 Quiz 3

Marks = 20

12th February, 2019

There are 4 questions in 1 page. Answer in the question paper itself and return.

Considering the following schema for a banking system, write SQL queries:

branch(bcode, bname, city, assets) customer(cid, cname, city)
account(ano, bcode, balance) depositor(cid, ano)
loan(lno, bcode, amount) borrower(cid, lno)

Q1: [5 marks] Find ids of customers whose total loan amount is more than their total account balance.

5
 ~~select cid~~
~~from customer~~
total amount \leftarrow select cid, sum(balance) as balance
from (depositor inner join account)
group by cid;
total loan \leftarrow select cid, sum(amount) as amount
from (borrower inner join loan)
group by cid;
select cid
from (total-amount inner join total-loan)
where amount > balance;

Q2: [5 marks] For each branch, find the customer id having the largest account balance. (For only this query, you may assume a customer having at most one account in a branch.)

1
 joined table = ((branch inner join account) inner join depositor)
inner join customer).
select bcode, max(balance), cid
from joined table
group by bcode.

Q3: [5 marks] Find ids of all customers having an account and loan with the same number.

5
 select cid
from customer C, depositor D, borrower B.
where C.cid = D.cid and C.cid = B.cid and
D.ano = B.lno;

Q4: [5 marks] Find ids of all customers who have exactly one account and exactly one loan at "ITT" branch.

*
 one account \leftarrow a-d-c \leftarrow (account inner join depositor) inner join customer
one loan \leftarrow l-b-c \leftarrow (loan inner join borrower) inner join customer
id \leftarrow select cid, count(ano)
from a-d-c
where bcode = ITT,
select cid, count(lno)
from l-b-c
where bcode = ITT
select cid
from one-account, one-loan
where one-loan.cid = one-account.cid and count(ano) = 1
and count(lno) = 1