BMEG3120: Exercise List 3

Assume that we have these tables:

- CUST: schema (cid, name), where *cid* and *name* are a customer's id and name, respectively. The table has a candidate key {cid}.

- BRANCH: schema (bid, city), where each tuple represents a branch of HSBC. Specifically, *bid* is the branch's id, and *city* is the city where the branch is located. The table has a candidate key {bid}.

- ACCOUNT: schema (cid, bid, balance), where each tuple represents an account. Specifically, *cid* is the customer id of the account's owner, *bid* is the id of the branch where the account was opened, and the meaning of *balance* is obvious. The table has a candidate key {cid, bid}.

Write SQL queries to solve the following problems.

Problem 1. Find the balances of all the accounts owned by the customer(s) named John.

Answer.
select balance
from CUST, ACCOUNT, BRANCH
where CUST.cid = ACCOUNT.cid and ACCOUNT.bid = BRANCH.bid and name = 'John'

Problem 2. Find the cids of the customers that have accounts only in HK.

Answer.
(select cid
from ACCOUNT, BRANCH
where ACCOUNT.bid = BRANCH.bid and city = 'HK')
minus
(select cid
from ACCOUNT, BRANCH
where ACCOUNT.bid = BRANCH.bid and city <> 'HK')

Problem 3. Find the cids of the customers that have accounts in both NY and HK, but not in any other city.

Answer.
((select cid
from ACCOUNT, BRANCH
where ACCOUNT.bid = BRANCH.bid and city = 'HK')
intersect
(select cid
from ACCOUNT, BRANCH
where ACCOUNT.bid = BRANCH.bid and city = 'NY'))
minus
(select cid
from ACCOUNT, BRANCH
where ACCOUNT.bid = BRANCH.bid and city <> 'HK' and city <> 'NY')

Problem 4*. Find the cids of the customers that have accounts in all the cities where HSBC has a branch.

Answer.
(select cid from ACCOUNT)
minus
(select cid from
((select * from (select cid from ACCOUNT), (select city from BRANCH))
minus
(select cid, city from ACCOUNT, BRANCH where ACCOUNT.bid = BRANCH.bid))