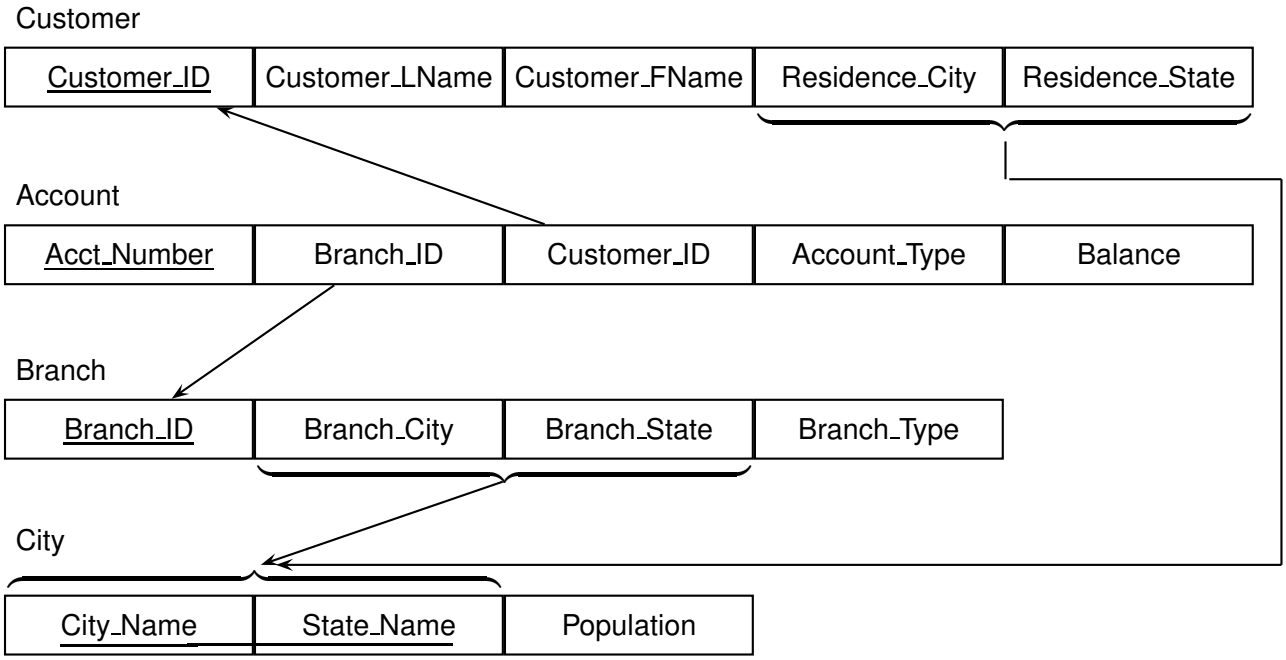
5DV021 Principles of Database Systems Fall 2008
Class Exercises on SQL

Solutions to SQL queries on the examination of January 09, 2006.



Problem 9:

(a) Find the names (last and first) of those customers who have accounts in both the state with State_Name VT and the state with State_Name NH.

```
Select Customer_LName, Customer_FName
From Customer C, Account A1, Account A2, Branch B1, Branch B2
Where C.Customer_ID=A1.Customer_ID and
      C.Customer_ID=A2.Customer_ID and
      B1.Branch_ID=A1.Branch_ID and
      B2.Branch_ID=A2.Branch_ID and
      B1.Branch_State='VT' and B2.Branch_State='NH';
```

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(b) Find the names (last and first) of those customers who have an account in every branch which is located in a city with City_Name Burlington.

```
Select Customer_LName, Customer_FName
From Customer C, Account A, Branch B
Where C.Customer_ID=A.Customer_ID and
      B.Branch_ID=A.Branch_ID and
      not Exists
      (Select *
       From Branch B1
       Where B1.Branch_City='Burlington'
             and not exists
             (Select *
              From Account A2
              Where A2.Customer_ID=C.Customer_ID and
                    A2.Branch_ID=B1.Branch_ID) );
```

(c) Find the names (last and first) of those customers who do have exactly two accounts in branches which are located in the state with State_Name NH.

```
Select Customer_LName, Customer_FName
From Customer C, Account A1, Account A2,
                 Branch B1, Branch B2
Where C.Customer_ID=A1.Customer_ID and
      C.Customer_ID=A2.Customer_ID and
      B1.Branch_ID=A1.Branch_ID and
      B2.Branch_ID=A2.Branch_ID and
      B1.Branch_State='NH' and B2.Branch_State='NH' and
      A1.Acct_Number <> A2.Acct_Number and
      not Exists
       (Select *
        From Account A3, Branch B3
        Where A3.Branch_ID=B3.Branch_ID and
              A3.Customer_ID=C.Customer_ID and
              B3.Branch_State='NH' and
              A3.Acct_Number <> A1.Acct_Number and
              A3.Acct_Number <> A2.Acct_Number );
```

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Problem 10:

(a) For each Branch_ID in the Branch relation, list both the total number of accounts held at that branch, as well as the number of distinct account types held at that branch. All Branch_IDs must be listed in the result, even those which house no accounts at all.

```
Select Branch_ID, count(Acct_Number), Count(distinct Account_Type)
From   Account
Group by Branch_ID
Union
Select Branch_ID, 0, 0
From Branch
Where Not Exists
     (Select *
     From Account
     Where Account.Branch_ID=Branch.Branch_ID);
```

(b) For each (City_Name,State_Name) pair in the City relation, list the average balance of all accounts which are held by customers who live in (*i.e.*, have residence at) that (City_Name,State_Name) pair. If there are no accounts associated with a given (City_Name,State_Name) pair, list the average as zero.

```
Select Residence_City, Residence_State, Avg(Balance)
From Customer, Account
Where Customer.Customer_ID=Account.Customer_ID
Group by Residence_City, Residence_State
Union
Select City_Name, State_Name, 0
From City
Where Not Exists
      (Select *
       From Customer
       Where Residence_City=City_Name and
             Residence_State=State_Name);
```

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(c) Define a *home account* of a customer to be one which is held in a branch which is located in the residence city and state of that customer, and the *home balance* of a customer to be the sum of all balances of the home accounts of that customer. Display the name and customer ID of that customer who has the greatest home balance. In case of a tie, display all such customers.

```
Select C1.Customer_ID, C1.Customer_LName, C1.Customer_FName,
       Sum(A1.Balance)
From Customer C1, Account A1, Branch B1
Where C1.Customer_ID=A1.Customer_ID and
      A1.Branch_ID=B1.Branch_ID and
      B1.Branch_City=C1.Residence_City and
      B1.Branch_State=C1.Residence_State
Group by C1.Customer_ID, C1.Customer_LName, C1.Customer_FName
Having Not Exists
    (Select C2.Customer_ID, Sum(A2.Balance)
     From Customer C2, Account A2, Branch B2
     Where C2.Customer_ID=A2.Customer_ID and
           A2.Branch_ID=B2.Branch_ID and
           B2.Branch_City=C2.Residence_City and
           B2.Branch_State=C2.Residence_State
     Group by C2.Customer_ID
     Having Sum(A2.Balance) > Sum(A1.Balance));
```

(d) Move all checking accounts which are housed in a branch located in the (City_Name,State_Name) pair (Burlington,VT) to the branch whose ID is 1234.

```
Update Account
Set Branch_ID='1234'
Where Account_Type='checking' and
      Acct_Number in
      (Select Acct_Number
              From Account, Branch
               Where Account.Branch_ID=Branch.Branch_ID and
                     Branch_City = 'Burlington' and
                     Branch_State = 'VT');
```

(e) Delete all customers who do not have any accounts from the Customer relation.

```
Delete
From Customer
Where Not Exists
      (Select *
       From Account
       Where Account.Customer_ID=Customer.Customer_ID);
```