DTSC660: Data and Database Management with SQL
Module 4
Assignment 4

Directions:

You will have ***one attempt*** at submitting this assignment. The assignment will be manually graded by the course grader. Read all directions. You must submit your solutions in the .sql file template that I have supplied. This file includes comments that delineate the file into sections - one section per problem. Be sure to write your name and at the top of the .sql file at the location I have indicated in the template. You must rename the .sql file according to the following format prior to submission:

```
<LastName>_<DOB_DayOfMonth>_Assignment_4.sql
```

Where `<LastName>` is your last name and `<DOB_DayOfMonth>` is the day of the month you were born. This naming convention is merely meant to make the grading process easier. For example, my .sql file would have the name:

```
Hollers_21_Assignment_4.sql
```

Submissions that do not adhere to these guidelines may receive a grade of zero.

Question 1:

Consider the bank database schema given below, where the primary keys are underlined. Write the SQL DDL corresponding to this schema (i.e. the CREATE TABLE statements). When you are writing the DDL, make sure you do the following:

a. Create the tables in the order specified in the schema
b. Use the exact naming convention for table names and attributes
c. Do not add or remove tables or attributes
d. For each table, I have provided some assumptions that can be made about the various attributes and relationships between the tables. Your DDL should ensure that these assumptions are true by how you define the table, data types used, and enforcement of keys and triggers.
e. For this example, there is only one bank, and the individual branches listed in the data are all owned by the one bank
f. Any attributes identified as the varchar data type should have a length of 40. (varchar(40))

g. By the time you have completed you will have at least one of each of the following. Failure to define these will result in lost points:
    i. check constraint
    ii. not null constraint
    iii. on delete cascade clause
    iv. on update cascade clause
    v. default value statement.

Database Schema:

branch (<u>branch_name</u>, branch_city, assets)
customer (<u>cust_ID</u>, customer_name, customer_street, customer_city)
loan (<u>loan_number</u>, branch_name, amount)
borrower (<u>cust_ID</u>, <u>loan_number</u>)
account (<u>account_number</u>, branch_name, balance)
depositor (<u>cust_ID</u>, <u>account_number</u>)

Important notes for each table:

- Branch: All branches must have assets that are monetary (they have a dollar value). There are four and only four cities with branches: Brooklyn, Bronx, Manhattan, and Yonkers.
- Customer: Customers must have a name.
- Loan: Loan numbers can contain both letters and numbers. All loans must have a monetary amount. The default amount for loans is zero dollars and zero cents. If a branch closes or changes its name, these activities should be reflected in the loan table.
- Borrower: A borrower is a type of customer, so if the cust_ID is deleted or changed, the borrower table should reflect these actions. The same is true of the loan_number.
- Account: Accounts should always have a monetary balance. If a branch closes or changes its name, these activities should be reflected in the account table.
- Depositor: A depositor is a type of customer, so if the cust_ID is deleted or changed, the depositor table should reflect these actions. The same is true of the account_number.

For the next section, you will need to use the data file attached to this assignment to complete your queries. If your queries do not run, go back and fix your Banking DDL. Make sure you use the correct table names and attributes. If your code does not execute with the provided data, you will not receive credit for the remaining parts of the assignment.

Question 2:

Write a query to find the cust_ID and customer name of each customer at the bank who only has a loan at the bank, and no account.

Question 3:

Write a query to find the cust_ID and customer name of each customer who lives on the same street and in the same city as customer '12345'. Include customer '12345' in your query results.

Question 4:

Write a query to find the name of each branch that has at least one customer who has an account in the bank and who lives in "Harrison".

Question 5:

Write a query to find each customer who has an account at *every* branch located in "Brooklyn".

THIS FINAL QUESTION USES THE UNIVERSITY SCHEMA, NOT THE BANKING DDL.

Question 6:

The following question references the University schema instead of the banking schema referenced in previous questions. Please write an appropriate query for the question below:

Write a SQL query using the university schema to find the ID of each student who has never taken a course at the university. Do this using no subqueries and no set operations (use an outer join).