Sistemas de Informação e Bases de Dados

Lab 06: Advanced SQL

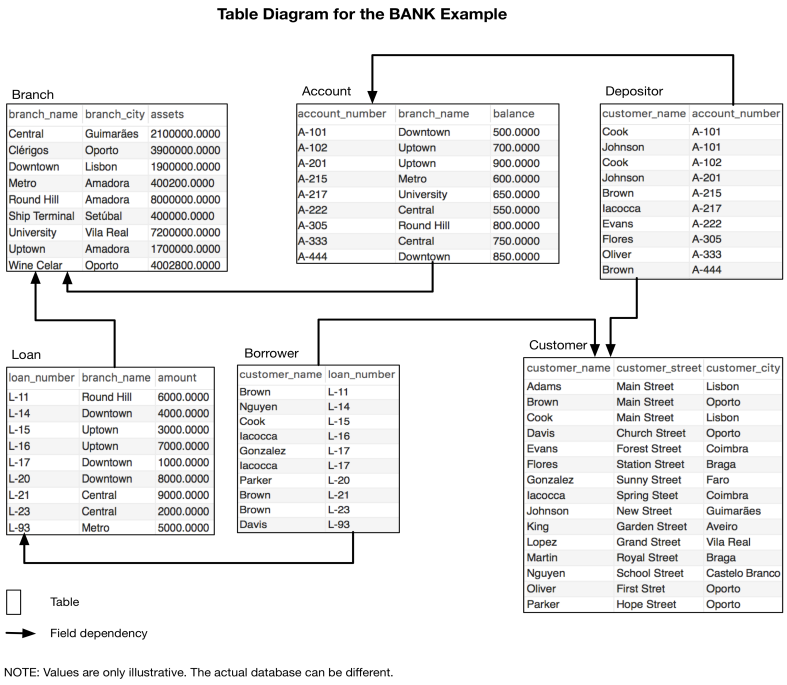

Figure 1. Illustration of the Bank database (the values presented in the table may not be the exact values in the database).

Consider the Bank database illustrated in Figure 1. If you have not yet created the database, follow the instructions of the first Lab guide. The **bank.sql** file contains the instructions to create the database

Write down appropriately structured SQL queries to answer the questions/needs of information of the question in sections below.

1. Queries using IN and NOT IN

Write an SQL query to answer each of the following questions:

a) Which clients live in cities that have bank branches?

b) What are the names and addresses of clients who have a bank account but no loans?

c) Who are the clients who have a loan at a branch in the same city where they live?

d) Which clients have at least one bank account and a loan?

2. Simple aggregation queries

Write an SQL query to answer each of the following questions:

a) What is the total amount of account balances in branches of the city of Amadora?

b) What is the maximum balance for an Amadora account?

c) How many clients live in the same city of a branch where they have an account?

d) How many clients have at least one bank account and no loan?

3. Queries using GROUP BY

Write an SQL query to answer each of the following questions:

a) What is the maximum balance per city?

b) What is the average balance per city?

c) What is the number of accounts per branch?

d) What is the number of accounts on each city that has a branch?

e) What is the total balance per customer?

f) Which clients have more than one loan?

g) List, alphabetically, the names of customers who have more than two bank accounts

4. Nested/Correlated Queries

Write an SQL query to answer each of the following questions:

a) Which branches have fewer recorded assets (branch assets) than liabilities (total amount of loans)?

b) Which branches have fewer real assets (sum of all balances of all accounts) than liabilities (total amount of loans)?

c) What are the branch names and the difference between the total balance of their accounts and the total amount of their loans?

d) For each customer, what are their names, total in loans and total in balances?

e) Who are the customers whose total of their debts (loans) is greater than the total of their assets (accounts)?

5. Queries to determine the distinctive element

Write an SQL query to answer each of the following questions:

a) What is the name of the customer that owes the most money to the bank (in its total loans)?

b) Which branch has the most accounts?

c) Which branch has the highest account average balance (among all agencies)?

d) How many customers exist per branch city (considering all branches)?

e) Which branch city has the most customers (considering all its branches)?

f) What is the name and address of the customer who has the greatest total balance?

6. Queries with UNIQUE and EXISTS

Write an SQL query to answer each of the following questions using UNIQUE or EXISTS operator:

a) Which accounts have only one owner (one depositor)?

b) Which cities have a branch?

c) Which cities have a branch with more than 1 account?

d) Which branches have an account with more than one owner?

7. Queries with OUTER JOIN

Write an SQL query to answer each of the following questions:

a) List the customer names and streets, along with their loans numbers, if they exist, of the customers that live in Lisbon

b) List all customer names and cities along with their highest loan, and biggest account, if they exist

8. Queries that test for coverage (Division)

Write an SQL query to answer each of the following questions:

a) Who are the clients that have accounts at all branches of the bank?

b) Who are the clients that have accounts at all branches of Lisbon?

c) Who are the clients who have accounts at all branches in the same city where they live?