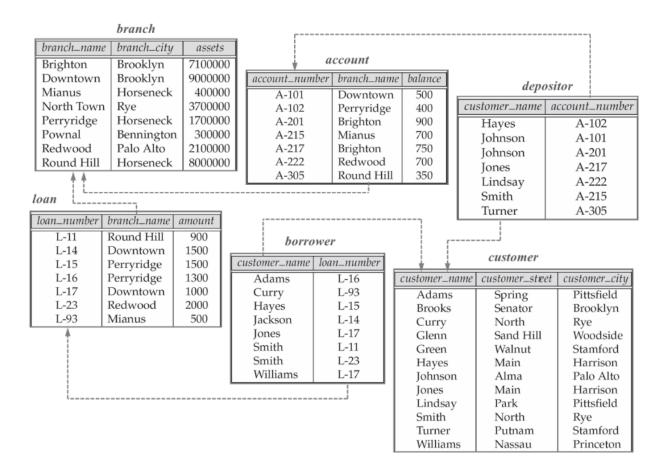
Sistemas de Informação e Bases de Dados Information Systems and Databases

Fall Semester

Lab Session 7: Functions, Stored Procedures and Triggers

We will be using the bank database of previous labs.



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Part I: Functions

Here is how to create a function that counts the accounts of a given customer, where the customer name is passed as input parameter to the function:

```
delimiter $$

create function count_accounts(c_name varchar(255))
returns integer
begin
    declare a_count integer;
    select count(account_number) into a_count
    from depositor
    where customer_name = c_name;
    return a_count;
end$$

delimiter;
```

1. Write an SQL function that returns the "absolute balance" of a customer. The "absolute balance" is the difference between all the money that the customer has (in accounts), and all the money that the customer owes to the bank (in loans).

Hint: the following queries return the balance for customer 'Smith'. You can combine these queries in your function:

```
select sum(balance)
from account natural join depositor
where customer_name = 'Smith';

select sum(amount)
from loan natural join borrower
where customer_name = 'Smith';
```

- 2. Check that the function that you have created yields the same result as the query above when 'Smith' is passed as input parameter.
- 3. Using your function, find the customer who has the highest absolute balance in the bank.

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Note: when determining the absolute balance of each customer, consider only those customers who appear both in table depositor and in table borrower.

Part II: Stored Procedures

We have seen how to create a stored procedure to execute an arbitrary SQL statement. Here is a simple example:

4. Write a new stored procedure that returns, for a given branch, the list of customers who have accounts in that branch.

Hint: the following query returns the list of customers who have accounts in 'Brighton'. You can use a similar query in your procedure:

```
select customer_name
from depositor as d, account as a
where d.account_number = a.account_number
and a.branch_name = 'Brighton';
```

5. Call your stored procedure and check that it produces the same result as the query above when 'Brighton' is passed as input parameter.

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Part III: Triggers

Here is how to create a trigger to automatically create a new loan when the balance of an account becomes negative:

```
delimiter $$
create trigger check balance before update on account
for each row
begin
    if new.balance < 0 then
        insert into loan values (new.account number,
                              new.branch name,
                              (-1)*new.balance);
        insert into borrower (
            select customer name, account number
            from depositor as d
            where d.account_number = new.account_number);
        set new.balance = 0;
    end if;
end$$
delimiter;
```

The trigger above will be called every time there is an update to table account. If the balance of an account is changed to a negative value, the trigger creates a new loan and also associates the depositors of the account as borrowers for the new loan. Finally, it sets the account balance to zero.

- 6. Write a new trigger to be called every time there is an update on table loan. If the amount of a loan is changed to a negative value, the trigger should create a new account and also associate the borrowers of the loan as depositors for the new account. Finally, it should set the loan amount to zero.
- 7. Test the trigger by subtracting 1200 from the amount of 'L-17'. Confirm that a new account has been created, that the depositors for that account have been inserted correctly, and that the amount of 'L-11' has been set to zero.

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+	+	+-		-+
account_number	branch_name	I	balance	I
+	+	+-		-+
A-101	Downtown	Ι	500.00	1
A-102	Perryridge	Ι	400.00	1
A-201	Brighton	ı	900.00	١
A-215	Mianus	ı	700.00	١
A-217	Brighton	ı	750.00	ı
A-222	Redwood	Ĺ	700.00	Ì
A-305	Round Hill	Ĺ	350.00	Ì
L-17	Downtown	Ī	200.00	İ
	.			

+	++
+	++
Johnson	A-101
Hayes	A-102
Johnson	A-201
Smith	A-215
Jones	A-217
Lindsay	A-222
Turner	A-305
Jones	L-17
Williams	L-17
+	. 4

+		+
loan_number	branch_name	amount
L-11 L-14 L-15 L-16	Round Hill Downtown Perryridge Perryridge	900.00 1500.00 1500.00
L-17 L-23 L-93	Downtown Redwood Mianus	0.00 2000.00 500.00

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