Laboratory work 7

*Please, use lab7.sql to create and fill tables*

1. How can we store large-object types?

Large-object types are stored as a large object:

* blob: binary large object
* clob: character large object

1. What is the difference between privilege, role and user?

- Privileges control the ability to run SQL statements.

- A role is a group of privileges.

- Database users are the ones who really use and take the benefits of the database.

* + create *accountant, administrator, support* roles and grant appropriate privileges

create role Administrator;

create role Accountant;

create role Support;

grant all on accounts, customers, transactions to Administrator;

grant all on accounts, transactions to Accountant;

grant select on customers to Support;

* + create some users and assign them roles,

create user Diana;

create user Ayana;

create user Dias;

* + give to some of them permission to grant roles to other users

grant Administrator to Diana;

grant Accountant to Ayana;

grant Support to Dias;

alter user Dias createrole;

* + revoke some privilege from particular user

revoke delete on transactions from Ayana;

1. Add appropriate constraints
   * -
   * add not null constraints

alter table transactions alter column date set not null;

alter table customers alter column name set not null;

alter table accounts alter column currency set not null ;

1. –
2. Create indexes:
   * index so that each customer can only have one account of one currency

create index src\_am on accounts(customer\_id, currency);

* + index for searching transactions by currency and balance

create index cur\_bal on accounts(currency, balance);

1. Write a SQL transaction that illustrates money transaction from one account to another:
   * create transaction with “init” status
   * increase balance for destination account and decrease for source account
   * if in source account balance becomes below limit, then make rollback
   * update transaction with appropriate status(commit or rollback)

begin;

update accounts

set balance = balance + transactions.amount

from transactions

where account\_id=transactions.dst\_account and transactions.status='init';

update accounts

set balance = balance -transactions.amount

from transactions

where account\_id=transactions.src\_account and transactions.status='init' and (balance-transactions.amount) >= accounts.limit;

commit;

rollback;