Transaction Management

Any action that include SELECT, INSERT, or UPDATE command, or combination of these commands are called a transaction.

DELETE (Those users who have ADMIN ROLE, may have this privilege)

When normal users DELETE from database, those records are actually not deleted but they are transferred to another table!!! (REMEMBER FACEBOOK example)
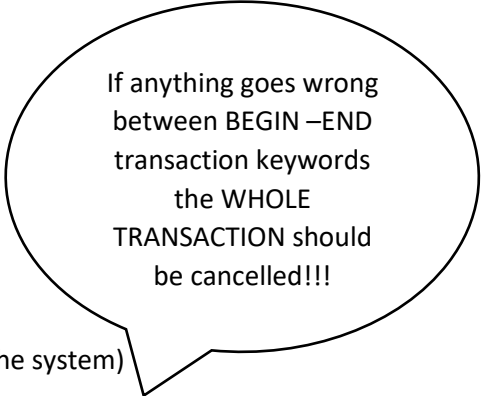
Begin Transaction

SELECT

INSERT data

UPDATE data

SELECT

INSERT

UPDATE

End Transaction

If anything goes wrong between BEGIN –END transaction keywords the WHOLE TRANSACTION should be cancelled!!!

Bank example (ATM)

Begin TRANSACTION (Insert your Card – enter your password – enter into the system)

Check your balance (SELECT balance FROM account WHERE card_holder=1234;)

Withdraw money (UPDATE account SET balance=balance-amount WHERE card_holder=1234;)

Check your balance again (SELECT balance FROM account WHERE card_holder=1234;)

Pay your Electric bill (UPDATE stm)

End TRANSACTION (COMMIT (saves changes))

CONCURRENT TRNSACTIONS

JOINT ACCOUNT (5000)

Husband (8:00 am –Nicosia)	Wife (8:00 am –Girne)
(Deposit money)	(Withdraw money)
BEGIN T. (8:00:30)	BEGIN T. (8:00:31)
JOINT ACCOUNT IS **LOCKED** for HUSBAND	WIFE HAS TO WAIT!!!!
DEPOSIT 2000	WIFE HAS TO WAIT!!!!
New BALANCE = 5000+2000=7000	WIFE HAS TO WAIT!!!!
END T. (8:05:00) COMMIT (DB/TABE is **unlocked**!!!)	READS the BALANCE (DB is **LOCKED**!!!)
	Withdraw 4000
	New BALANCE = 7000+4000=3000
	END T. (8:10:00) COMMIT
	(DB/TABE is **unlocked**!!!)

PROPERTIES of TRANSACTIONS (ACID Properties)

A→ Atomicity: ALL or NOTHING property. Either the whole transaction succeeds or fails.

C→ Consistency

I→ Isolation

D→Durability

LOG FILES (RECORDS): All actions or steps that are done in a single/ series of transaction of users are stored in log files.

DDL (Data Definition Language)

- Create
- Alter
- Drop

DML (Data Manipulation Language)

- Select
- Insert
- Delete - subq
- Update - subq

DCL (Data Control Language) -users

- Grant
  Grant *privilege(s) (insert, delete, update, create table etc)* on *TABLE* to *USER (PUBLIC (all users))*
- Revoke
  Revoke *privilege(s) (insert, delete, update, create table etc)* on *TABLE* from *USER (PUBLIC (all users))*

TCL (Transaction Control Language)

- Commit
- Rollback