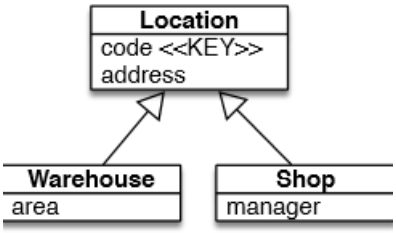

Location: code, address, kind --(shop/warehouse)
Store: code, manager **Warehouse**: code, area

OR

Location: code, address, kind, manager, area

Concurreny: The possibility/fact/problem that multiple users or applications can read/write/manipulate data in the database at the same time.

Which ACID attribute or attributes are connected to the problem of concurrency:

Isolation: a transaction cannot be influenced by another, or that one transaction cannot 'see' the effect of another transaction while it is not yet finished. Adding Consistency is not wrong: the integrity of the data can be endangered because of concurrent transactions.

Server should be robust against: Server crash, harddisk failure, network failures, fire, DoS attack

Use VALUES (3,"The Pop Hit Crew") to create a row with data.

INSERT INTO artist(artist_id,name) VALUES (3,"The Pop Hit Crew"); UPDATE performed_by SET artist_id=3 WHERE song_id=11 AND album_id=22

One of the queries is to slow for the application to behave according to the specification. Who needs to solve this, which role does the person have that needs to speed up the query?

The database administrator. He can tune things. SQL is declarative, which means that a different formulation of the query won't help. This means that the application programmer can't do anything. The databasedesigner is worth half the points (a different database design can speed up queries).

Why external schema?

Security (you can give users explicit access to a limited scheme). Ease of use (schemes can be built to be simpler and specific for use).

Foreign key

One or more attributes in atable that reference the key of a different table, i.e. exactly a row in a different table

One of the ACID-properties is Consistency. What does a dbms do when it is asked to execute a query, whose result violates the integrity rules, i.e. which endangers the consistency of the data

It will rollback the transaction, i.e. it will be as if it never happened

Conceptual schema: Airport(code:STRING, name:STRING, city:STRING, country:STRING)

SQL is in addition to a query language:

A data definition language(DDL) in order to define both conceptual and external schemas as well as integrity rules; • a data manipulation language (DML) to express queries and transactions with; and • a storage definition language (SDL) that the database designer can use to influence the physical schema. Please note that the semantics are not influenced by this; the speed of certain operations can change, not the results of those operations.

Surrogate key:

Unique auto generated key that has no other data in it (E.G. auto integer count)

DELETE FROM Flight WHERE number="KL123"

UPDATE Flight SET time="9:45" WHERE number="KL123"

INSERT INTO Flight(number,day,time,from,to) VALUES ("KL123","Monday","9:30","AMS","VIE")

CREATE TABLE Flight (number CHAR(5), day VARCHAR(15), time TIME, from CHAR(3), to CHAR (3), PRIMARY KEY (number), FOREIGN KEY (from) REFERENCES Airport(code), FOREIGN KEY (to) REFERENCES Airport(code));

ACID

• **Atomicity**. The DBMS guarantees that a transaction is either executed in its entirety, or not at all, meaning that it is as if the transaction has never been initiated. • **Consistency**. The DBMS guarantees that before and after a transaction the data complies with all integrity rules. In principle it is the transaction programmer's responsibility to ensure that the result also complies with the integrity rules, but the DBMS will check this and completely reverse a transaction in case of violation. • **Isolation**. Even though transactions are executed simultaneously, the DBMS guarantees that the effect of all transactions is the same as when all transactions would have been executed in sequence. In other words, as far as the user is concerned it is as if their transaction is the only one being executed. • **Durability**. The DBMS guarantees that if a transaction has been executed completely, that the effects of that transaction remain part of the database, even if the computer or physical storage media and the like suffer from an extensive breakdown.