

SQL 12: SCHEMA DESIGN - 1

29/05/24

AGENDA

- ① What is Schema Design?
- ② How to approach schema design?
- ③ Cardinality
- ④ Sparse Relations
- ⑤ Nuances while representing relations.

Schema + Design

Schema

Refers to the structure of DB.

- ① Tables in DB.
- ② Columns in table (data types)
- ③ Primary key
- ④ Foreign key.
- ⑤ Pictorial representation of how DB is structured

PRD

→ Product Requirement Document

int 4B	string (255)	int 4B	string (255)	bool 1B	int 4B
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~ 500 Bytes -

10^6 rows

$500 \times 10^6 \approx 5 \times 10^8$

$1 \text{ MB} = 10^6$

500 MB.

$= 0.5 \text{ GB}$

$1 \text{ GB} = 10^9$

$1 \text{ TB} = 10^{12}$

SCALER

1. Scaler will have multiple batches.
2. For each batch, we need to store the name, start month and current instructor.
3. Each batch of Scaler will have multiple students.
4. Each batch has multiple classes.
5. For each class, store the name, date and time, instructor of the class.
6. For every student, we store their name, graduation year, University name, email, phone number.
7. Every student has a buddy, who is also a student.
8. A student may move from one batch to another.
9. For each batch a student moves to, the date of starting is stored.
10. Every student has a mentor.
11. For every mentor, we store their name and current company name.
12. Store information about all mentor sessions (time, duration, student, mentor, student rating, mentor rating).
13. For every batch, store if it is an Academy-batch or a DSML-batch.

STEPS FOR SCHEMA DESIGN

- ① Find the tables to be created
- ② Name the tables
- ③ Add all the attributes that belong only to this table.
- ④ Find a PK.
- ⑤ Add the Relationship - FK - If any.

① Create a table.

- (i) find all nouns
- (ii) for each noun - check if we need to store some data about it
 - ↳ if yes - create a table
 - if no - ignore it.

② Name the table

① mentor sessions.

eg

mentor - sessions

mentorSessions

MentorSessions

Naming Conventions.

Snake case

Camel case

Pascal case

Convention :- a usual way of doing something

plural or singular.

③ Find a PK

A good PK.

P

→ unique + NOT NULL.

→ Should NOT change frequently. → (index)

→ easy to sort,

→ small in size

→ good convention

} integers.

table-name-id.

eg

batch-id.

Find the tables

① batches

② instructors

③ students

- ④ classes
- ⑤ mentors
- ⑥ mentor-sessions

- ① batches
 - batch-id
 - batch-name
 - start-date
 - batch-type

Entity Relation Diagram

- ② instructors
 - inst-id
 - inst-name

- ③ students
 - st-id
 - st-name
 - grad-year
 - email
 - centv-name
 - phone
 - buddy-id

- ④ Classes
 - class-id
 - class-name
 - date-time

⑤ mentors

- mentor_id
- mentor_name
- company_name

⑥ mentor_sessions

- ms_id
- session_time
- session_duration
- student_rating
- mentor_rating

RELATIONS

Cardinality (count)

(nouns)
2 entities

1 : 1

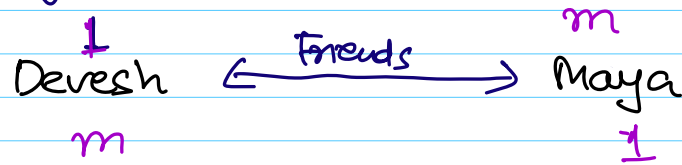
1 : m

m : 1

m : m

Ques

what is the cardinality of 2 users on a social networking site, e.g. FB..



m : m

1:1, 1:m, m:1, m:m

male - female

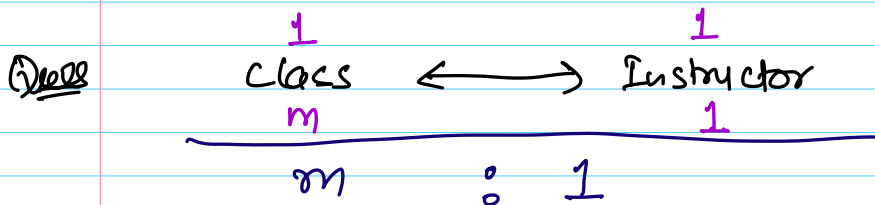
1 ← marriage → 1

1 ← father: daughter → m

m ← son: mother → 1

m ← siblings → m

BREAK TILL 8:22 AM.



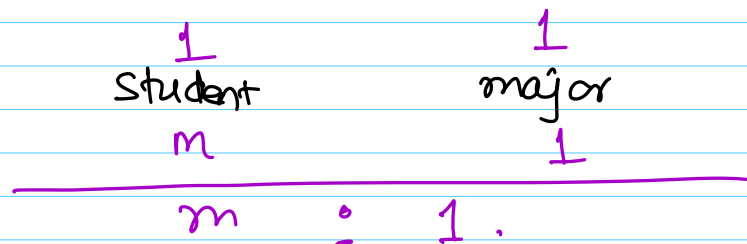
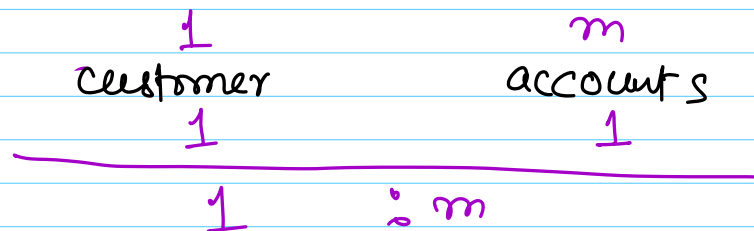
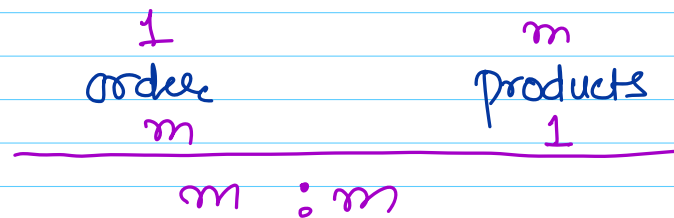
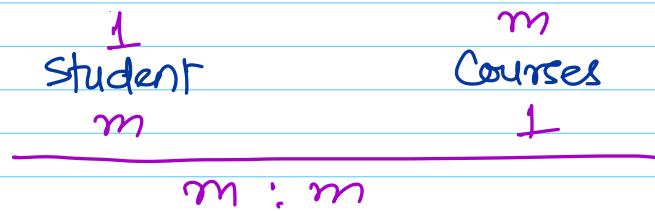
⇒ How to represent different cardinalities?

Relation Cardinality	Method
1:1	Any one relation can be used as an attribute (col) in another table.
1:m m:1.	"1" side information is added as an attribute (col) on "m" side table.
m:m	separate mapping table/lookup table.

table. user-friends

user_id	friend_id
101	102
102	101
103	502
104	205
101	105
101	106

101
102



str id	S-name	bid
1		NULL
2		NULL
3		NULL
:		
.		

→ 80% NULL.

Sparse
4 NOT dense.

Ques

table: student - batches.

st_id	brd
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Nuances wrt representing relations

taxo: wife.

[illegible]

Create a separate "marriage" table.

table: marriages

hrid	wrid	dom	por

NOTE Information about "relation" should NOT be stored in the entity table

SOLID → LLD

↑ Single Responsibility Principle.

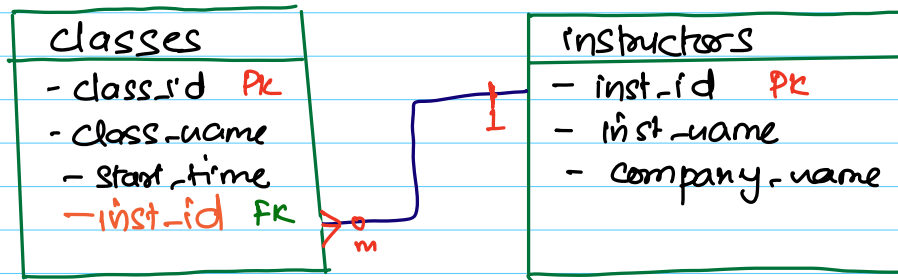
→ Every table should have only 1 reason to exist.

Assignment

Complete all tables with relations. (ft)

↓
cardinalities.

ER Diagram



dbdiagram.io