AGENDA:

Announcement:-

Saturday → 7:00 AM to 10:00 AM. IST

Weekdays → 7:00 AM IST to 9:30 AM IST. (From Tuesday)

1) Schema Design (few things that we will talk about in Schema Design)
   - → How to decide what tables
   - → How to model the cardinality between tables
   - → Normalization

2) SQL Data types

Database Schema

Design → Class Diagram
→ Usecase diagram
→ Api Design
→ Database Design.

Database Schema is how my database will be structured.

- → What are going to be different tables
- → Attributes inside every table
- → Cardinality of relation b/w 2 tables.

Pictorial representation of how your DB is going to be structured.

Schema Design is part of a design doc.

How To Approach Schema Design

Case Study:- Scaler.

Requirements:-

1) Scaler has students.
   Every student has name, grad-year, university, email, phone number.
2) There are several batches at scaler.
   Each batch has name, start month, instructor, students.
3) Every batch has classes.
   Each class has name, instructor.
4) Each student has a student buddy

5) A student may move from one batch to another.
   → Course Pause
   → Student Request
   Entry date of a student to a batch.

		Joined	Left
Priyanka	Aug 21 Batch.	22/08/2021	30/08/2021
	Oct 21 Batch.	30/10/2022	NULL.

6) Every student will have a mentor
   Each mentor will have a name, currentCompany, yoe, dob, education

Assignment

→ Design Netflix Schema.

Modelling Schema.

1) Find all entities in requirements.
   - anything for which we are storing details
   - anything causing some behaviour in the system.
     - real thing (Student, Mentor, instructor)
     - conceptual thing. (Batch, class)

How to find entities.

1) find all the nouns in the requirements.
2) for every noun, you see if you have to store any information about that noun.
   - If yes, you create a table for that.

1. Batches.
2. instructors.
3. classes
4. Students.
5. Mentors.

Batches

PK →
- id : INT
- name
- current_instructor
- classes

Instructors

- id
- name

Students

- id
- name
- grad_year
- university
- email
- phone number
- current_batch
- prev_batch

Classes

- id
- name
- instructor.
-

Mentors

- id
- name
- current company
- yoe
- email id.

Naming Conventions for Attributes.

- Camel Case.
- '_' delimeter. current_instructor.
- current instructor (Theoretically possible)
  - very wrong to do this.

id related conventions:

- id (common way)
- {table name}_id e.g. batch_id, class_id. (Helpful in natural joins)

How are we storing current_instructor in batches.

↓

Instructor entity.

There are rules around how to store them.

Cardinality of relationships b/w Entities.

If there is a relation b/w A and B

Cardinality → How many of A : How many of B.

1 : 1

1 : M

M : 1

M : M

M → many.

How to cardinality.

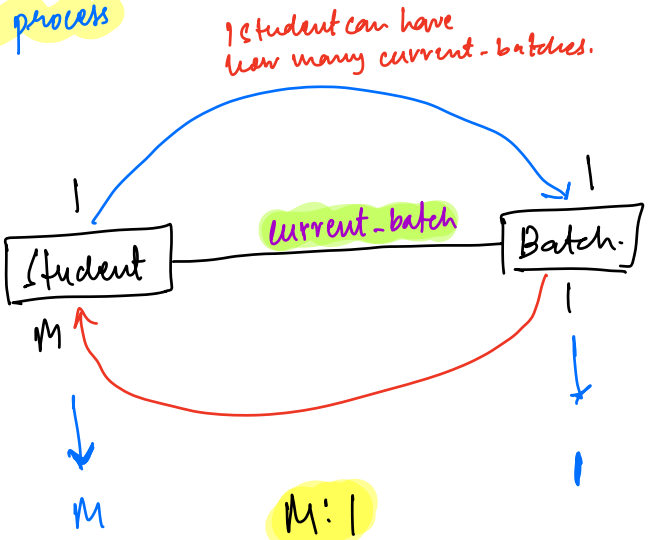
Step 1:- Find which relation b/w A and B are we talking about.

A: Student

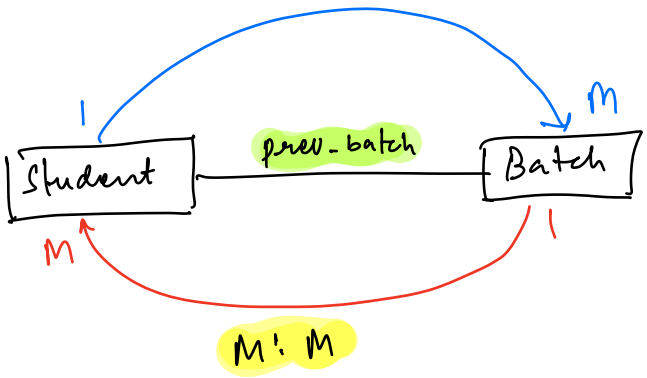
B: Batch.

Relation:- current_batch.

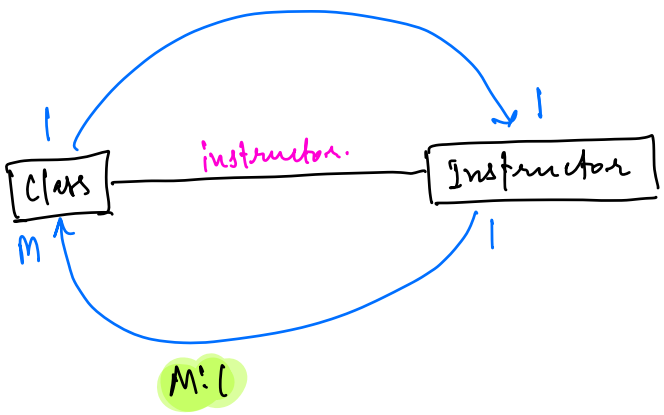
Step 2:- 2 step process



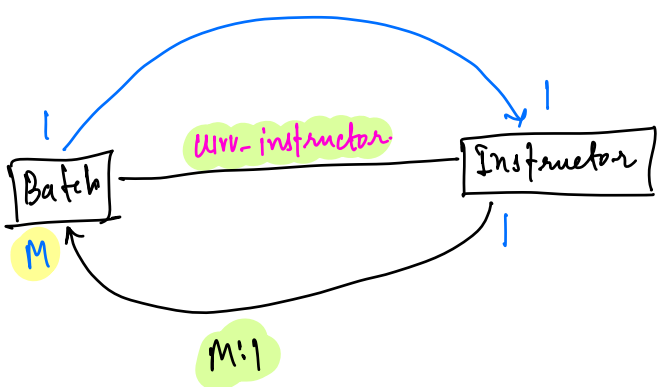
Step 3:- If M on one side, you put M there else 1 on that side.


1
M
Student
prev_batch
Batch
M
1
M : M

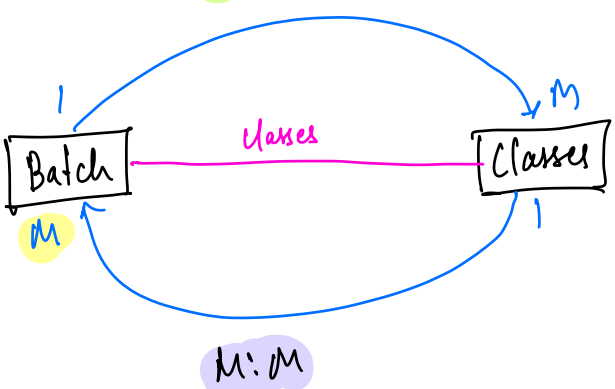
e.g.


1
1
Class
instructor
Instructor
M
1
M : 1

e.g.


1
1
Batch
curr_instructor
Instructor
M
1
M : 1

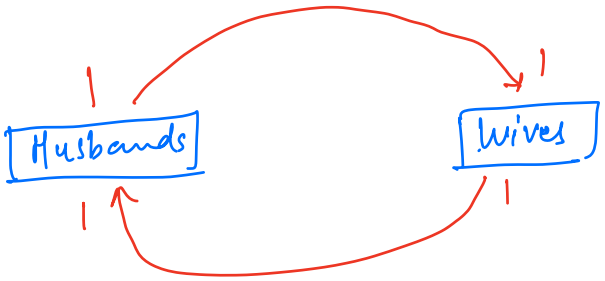
e.g.


1
M
Batch
classes
Classes
M
1
M : M

How to represent different cardinalities in a database.

1) 1:1

e.g.



1:1 cardinality.

Husbands.

id	name	wife-id

OR

Wives.

id	name	hus-id

In 1:1 relation, put the id of other (ANY) side on the diff. side.

hus-id in wives table as fk

OR

wife-id in husbands table as fk.

2) 1:M or M:1

Class

instructor-id

instructors.

class ids
[1, 2, 3, 4..]

1 class can have 1 instructor

1 instructor can have M classes

→ Store instructor-id in class table ✓

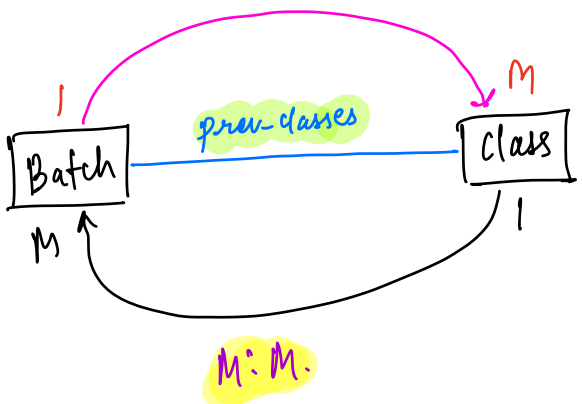
→ Store class_ids in in instructors table. X

2 options:-

1) The table which is related to many can have a list of ids ✗
   [Multivalued attributes not recommended] (Atomic values).

2) The table which is related to 1 can have a single id. ✓

3) M:M.



Batches.

	prev_classids
	[list of ids] ✗

Classes.

	batch_ids.
	[id1, id2,] ✗

Create a new table to store relationship b/w these 2.

→ mapping table / lookup table.

batch_classes.

batch-id	class-id.
1	2
1	5
1	7
2	2
3	2

→ PK for mapping table.

7:00 AM, 10:00 AM

↳ 3 hours