

Schema Design - 1

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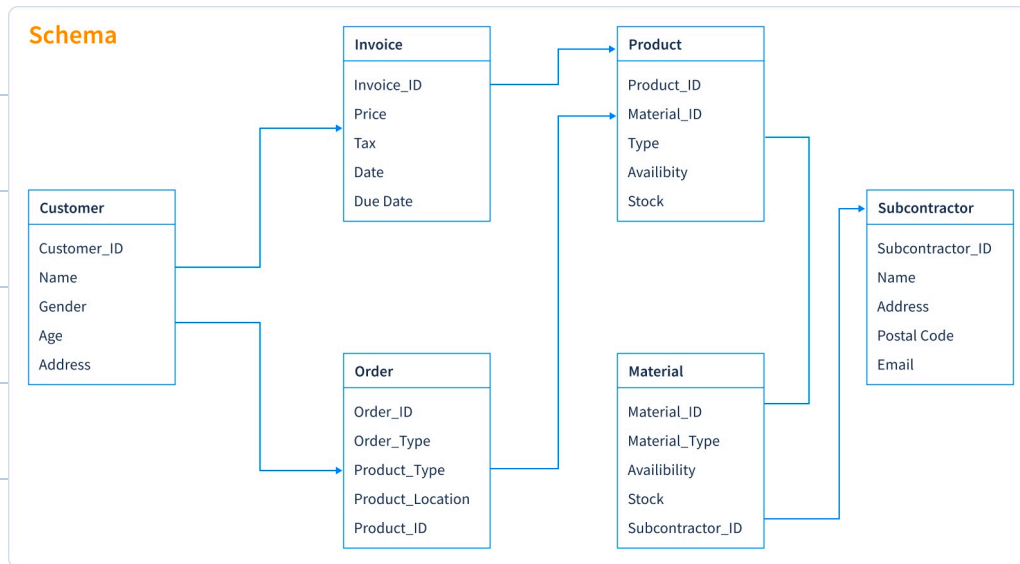
Notes

33rd Hard day challenge :

1. Assignments + Revision (mcq)
2. Backlog (Assignments of prev. session)
3. Additional Questions



Schema : Structure of Database



Schema gives information about :

1. Structure of Database
2. Tables in Database
3. Columns in a Table
4. Primary Key
5. Foreign Key
6. Index
7. Pictorial Representation



How to approach a schema design?

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 no.
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.

→ *google (enum values)*



Steps to follow :

1. Create the tables

↳ Identify the tables to be created.

i) Find nouns in your requirements.

ii) We need to decide whether we should create a table for that noun or not.

Naming convention

- Plural names → plural names
- Snake case : → mentor_sessions
- Attribute names in singular forms → (id, name)



2. Add primary keys and all other attributes

- It should be unique & not null.
- It should not get changed.
- Prefer number over strings

Batches

name
start_month
batch_instructor
batch_id (PK)

Students

name
grad_year
univ_name
email
phone_number
student_id (PK)

Classes

name
date
time
class_instructor
class_id (PK)

Mentors

name
company_name
mentor_id (PK)

Mentor_Sessions

time
duration
student_id
mentor_id
student_rating
mentor_rating
session_id (PK)



Cardinality

- It talks about how many entities of one side is related/connected to how many of other side.
- It talks about relationship strength of two tables.

i) 1 : 1

ii) 1 : M

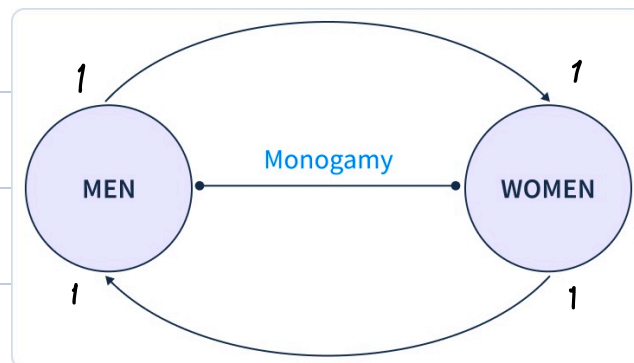
iii) M : M

iv) M : 1

1) 1 : 1

Men : Women

(1 : 1)



Two step process :

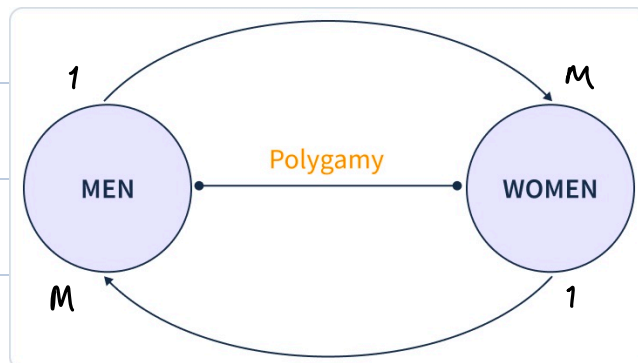
1. One man can marry how many woman.
2. One woman can marry how many man.



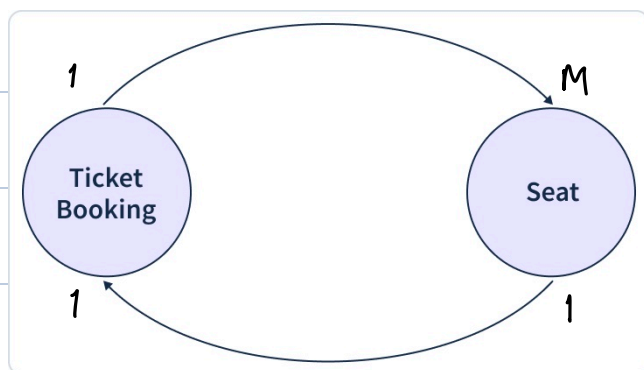
2) M : M

men : women

(M : M)



3) M : 1 or 1 : M

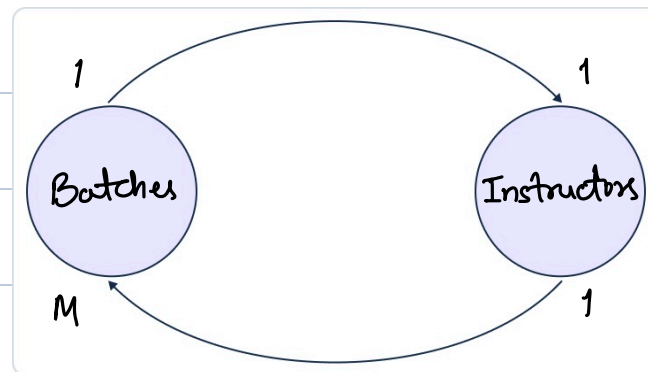


ticket booking : seat
(1 : M)

Seat : ticket booking
(M : 1)

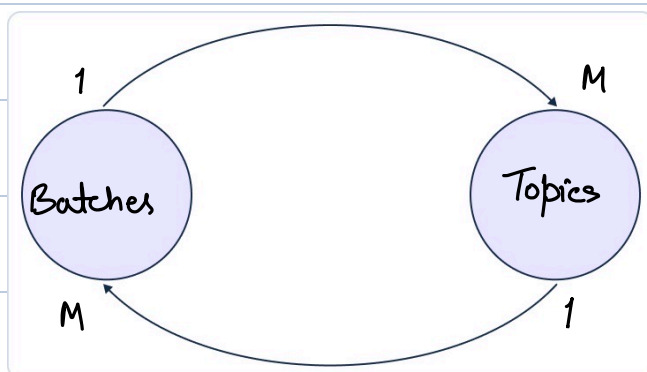


4) Find cardinality between Batches and Instructors



(M : 1)

5) Find cardinality between Batches and topic



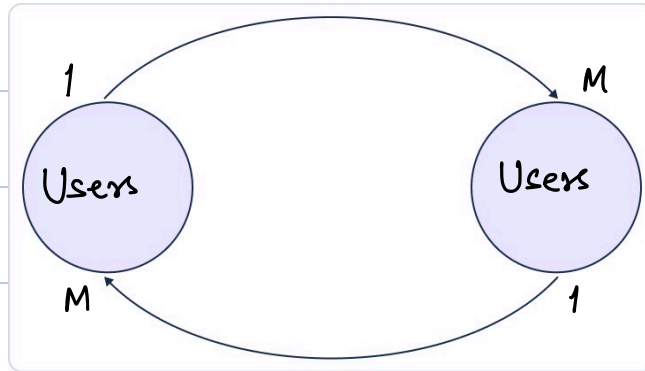
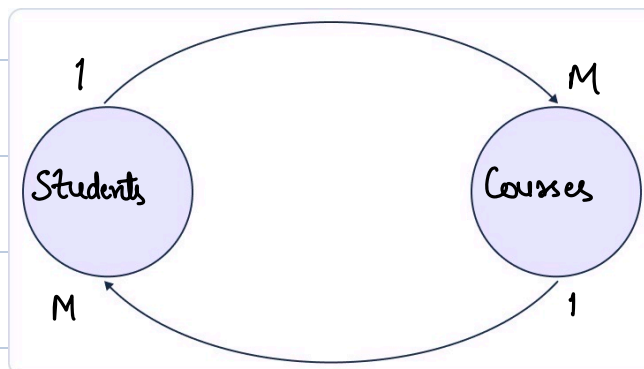
(M : M)

Batches	Topics
Jan 23 - SQL	Keys
Jan 24 - SQL	CRUD 1
Feb - 24 - SQL	CRUD 2

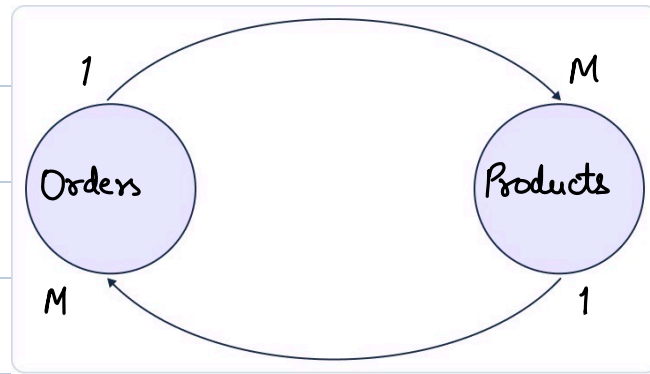


6)

Users to Users

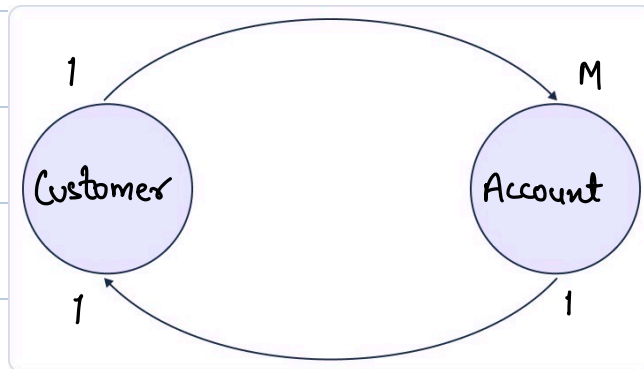
 $(M:M)$ * Quizzes °1.Ans: $(M:M)$

2



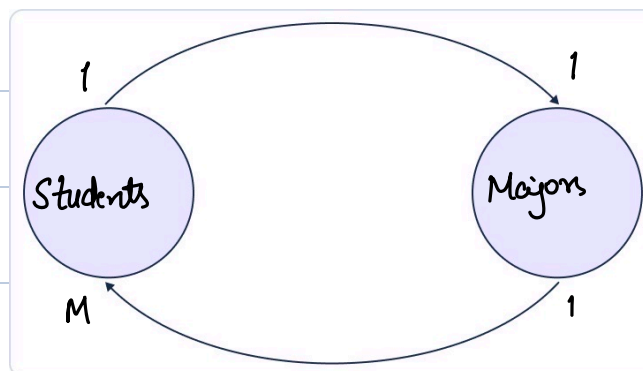
(M : M)

3



(1 : M)

4



(M : 1)



How to represent cardinalities in tables?

1) 1:1 Add column on either of the side.

Men

id	name	spouse-id
1	A	3
2	B	1
3	C	2

Women

id	name
1	D
2	E
3	F

2) 1:M or M:1

Batches (M)

id	name	Inst_id
1	Apr-23	1
2	Mar-23	2
3	May-23	1

Instructors (1)

id	name
1	Rahul
2	Mohit
3	Pateck

In case of 1:M or M:1 cardinality, we will always add a col^m on M's side.



3) M : M

Sessions (M)

id	name
1	CRUD 1
2	CRUD 2
3	Joins 1

Batches (M)

id	name
1	Mar-23
2	Apr-23
3	May-23

In case **M:M** cardinality we will add / create mapping / lookup table to store data about the relationship of these tables.

Sessions_batches (lookup table)

Session-id	Batch-id
1	1
2	1
1	2



Sparse Relations

1 million \longrightarrow 1000 got married

Men

id	name	Spouse-id
1	A	3 ⋮ Null
2	B	Null ⋮ Null
3	C	Null

Women

id	name
1	D
2	E
3	F

\rightarrow In case of sparse relationship, it is recommended to create a lookup/mapping table.

Men-id	Women-id
5050	5055
5051	8085

Men-Women

This above Table stores only related data, data of those people who got married.

→ Space efficient

→ Need to perform an extra join to retrieve the data.