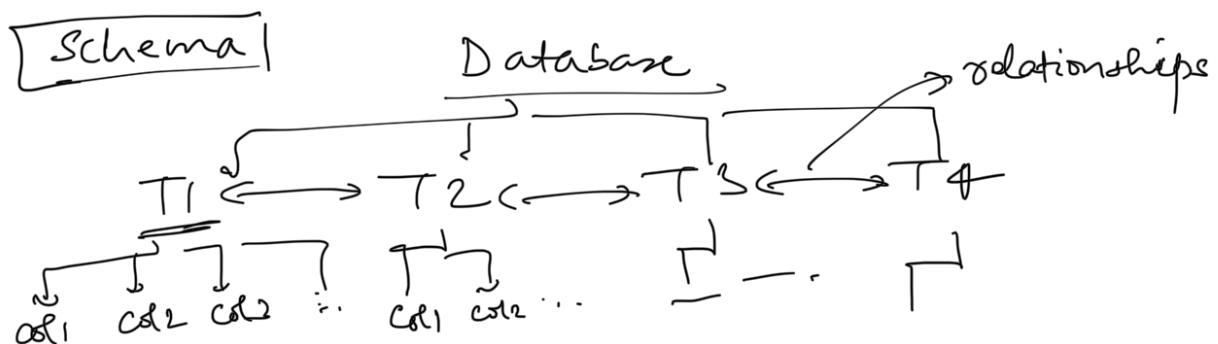


SCHEMA DESIGN - I

AGENDA:

- ① WHAT IS SCHEMA?
- ② WHAT CAN GO WRONG?
- ③ NORMALISATION - 1NF, 2NF.
- ④ APPROACH TO SCHEMA DESIGN
- ⑤ CARDINALITY

Scheme → plan or a structure



Flipkart

T-shirts

| id | color-type | size | price | brand | color |
|----|------------|------|-------|-------|--------|
| 1 | red | M | - | - | red |
| 2 | green | L | - | - | green |
| 3 | yellow | S | - | - | yellow |

Index

non-atomic

red
"red, green"

red

⇒ (SELECT * FROM Tshirts WHERE color LIKE "%red%")

Faster

| tshirt_id | Tshirt-color | Index |
|-----------|--------------|-------|
| 1 | red | |
| 2 | red | |
| 2 | green | |
| 3 | yellow | |

Indexing

| 1 | update | users | | | |
|---|--------|-------|------|-----|-------|
| 2 | id | email | name | ... | - - - |
| | | sid | | | |

Ex: 2

Bad Design

| class_id | topic | instructor_id | instructor_name |
|----------|-------------|---------------|-----------------|
| → 1 | transaction | 4 | Anshuman |
| → 2 | String day | 4 | Anshuman ✓ |
| → 3 | SEL - 2 | 4 | Anshuman ✗ |
| → 4 | SQL - 1 | 6 | Ayush |
| : | | | |
| | | | |

update prob → cost
delete prob
insert prob

Cost high update class set instructor_name = "Ayush"
where instructor_id = 4
update 1000 rows

classco.

| class_id | class_name | instructor_id | instructor_name |
|----------|------------|---------------|-----------------|
| 1 | SQL-1 | 4 | Anshuman |
| 2 | SQL-2 | 5 | Ayush |
| 3 | SQL-3 | 6 | Ayush |

orphaned
 LEFT JOIN
Instructor

Foreign key Option 1: ON CASCADE DELETE

U O T → Option 2: ~~NO CASCADE DELETE~~

Normalisation

1-NF

:

All columns are atomic in nature

color → red, green X

Users

| user_id | name | prog_lang | age | non-atomic |
|---------|-------|--------------|-----|------------|
| 1 | Rohul | C++ | 22 | |
| 2 | Kohit | Java, C++ | 24 | |
| 2 | Sana | Python, Java | 26 | |
| : | | | | |

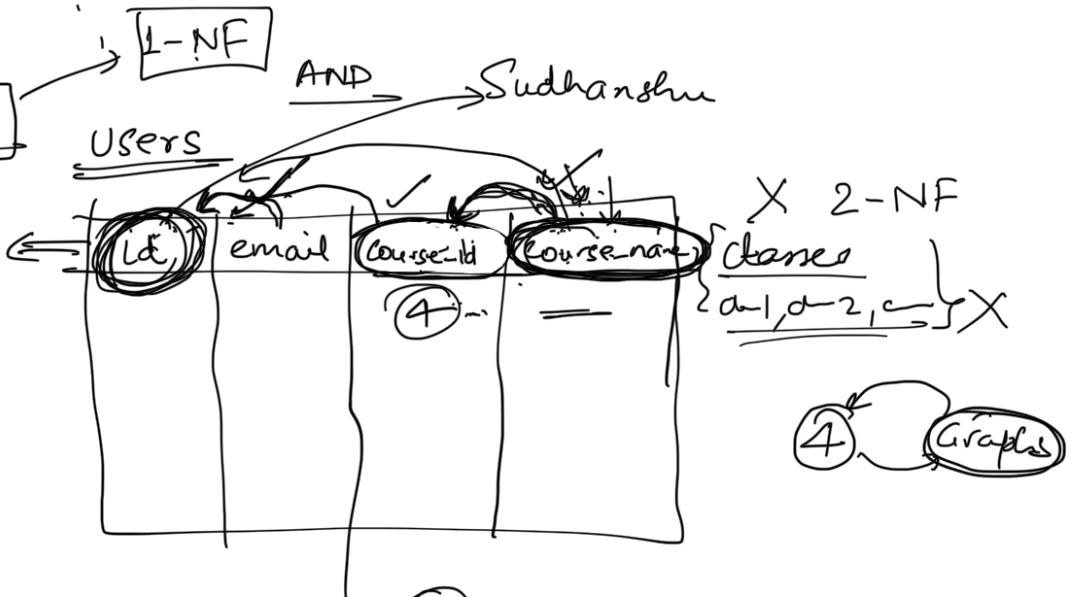
2-NF

1-NF

AND

Sudhangshu

primary key

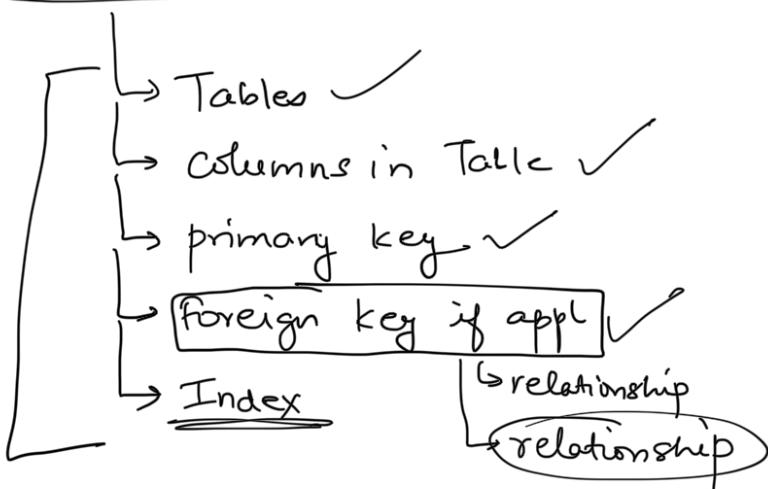


① Satisfies 1-NF

② No column should exist where they are an attribute of a non-primary key color

{3-NF
BCNF}

SCHEMA DESIGN



① Tables
↳ Entities/Noun

SCALER

- learners
- instructors
- dorseo
- TAs
- Mentors
- problems
- assignment
- batches.

Instagram

- Users
- posts
- reels
- pages
- messages
- likes

Steps

- Nouns / Entities

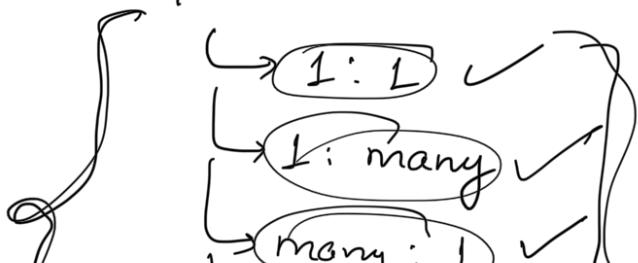
(Relationship later)

- primary key

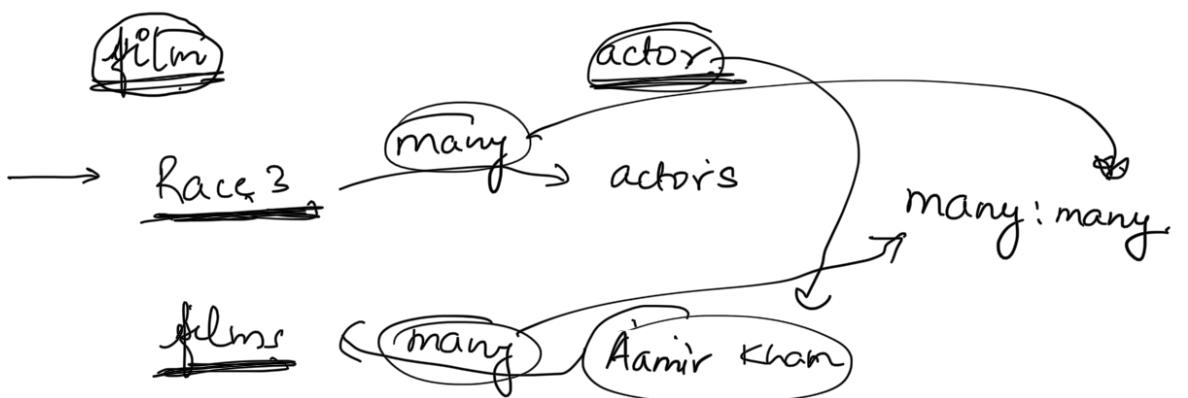
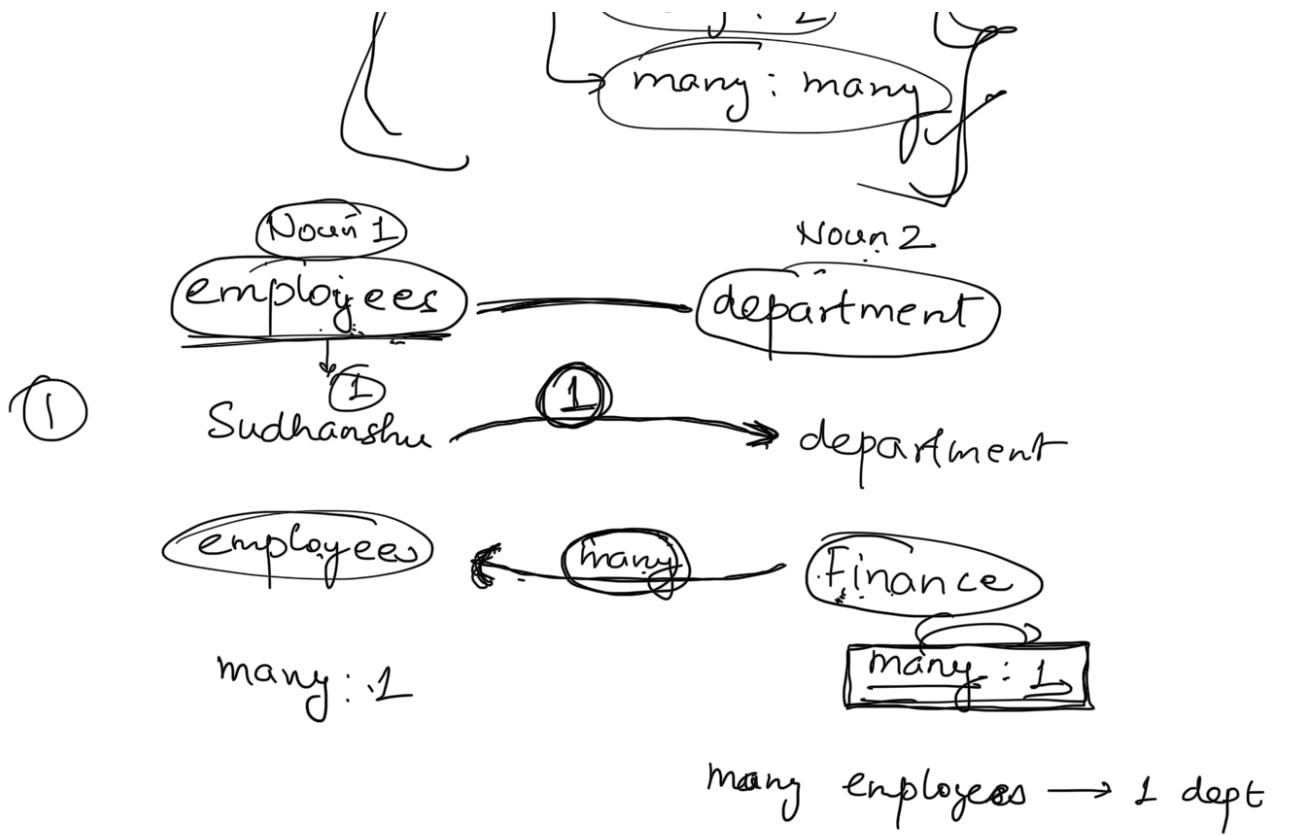
↳ key unique

↳ It should not change.

- Relationship

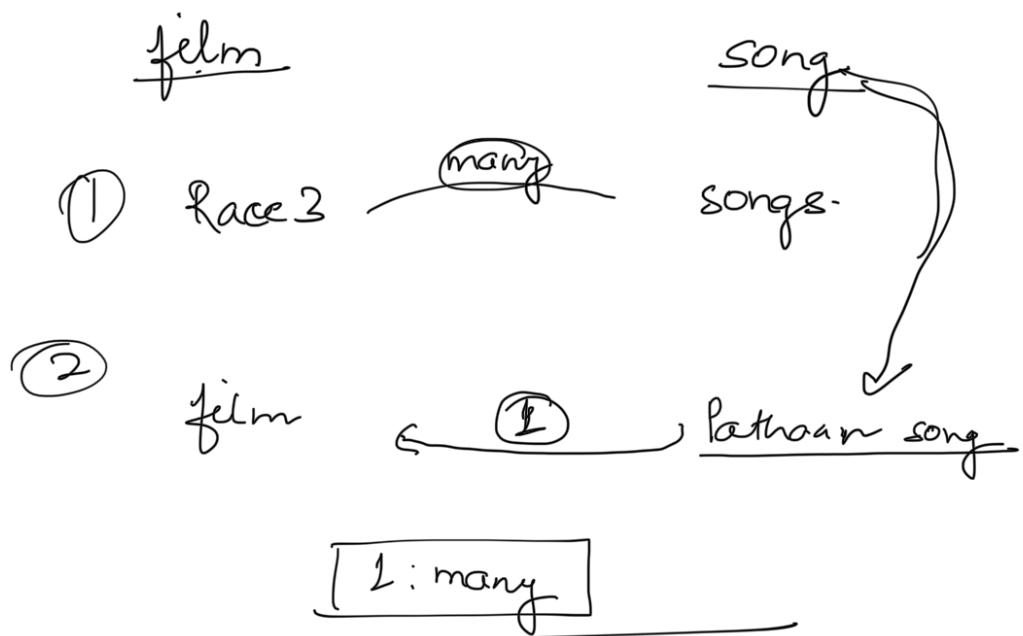


Cardinality



- second
[1] [left] to right:
— Take one example from left noun.
— How many of right noun are related to example
- first
[2] [Right] to [left]
— Take one example from right noun.
— How many of left noun are related

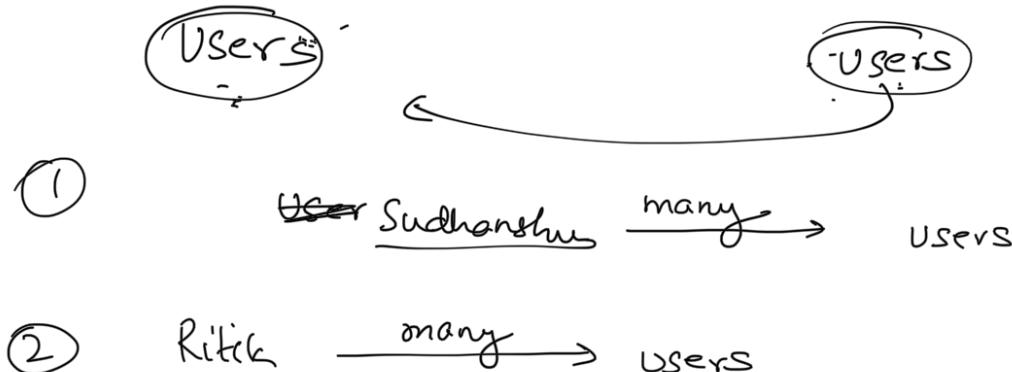
to example



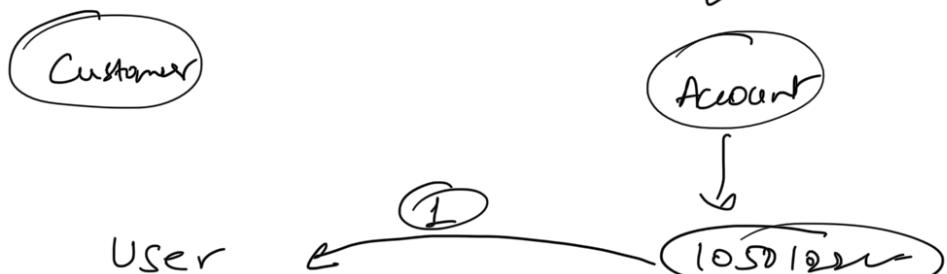
① right → left → Output 1

② left → right → Output 2

[01 : 02]

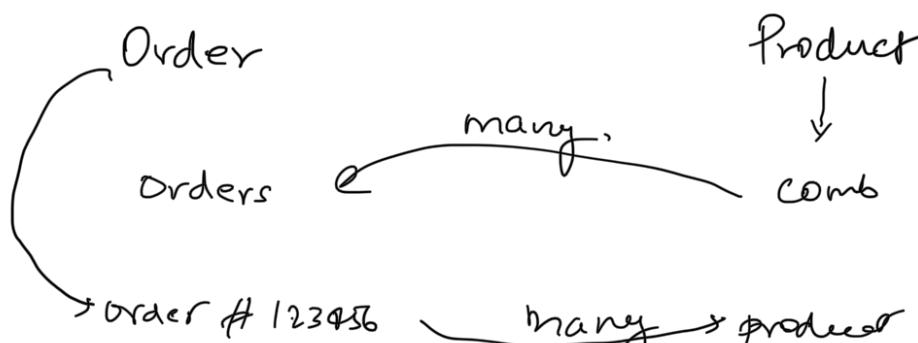


[many : many]

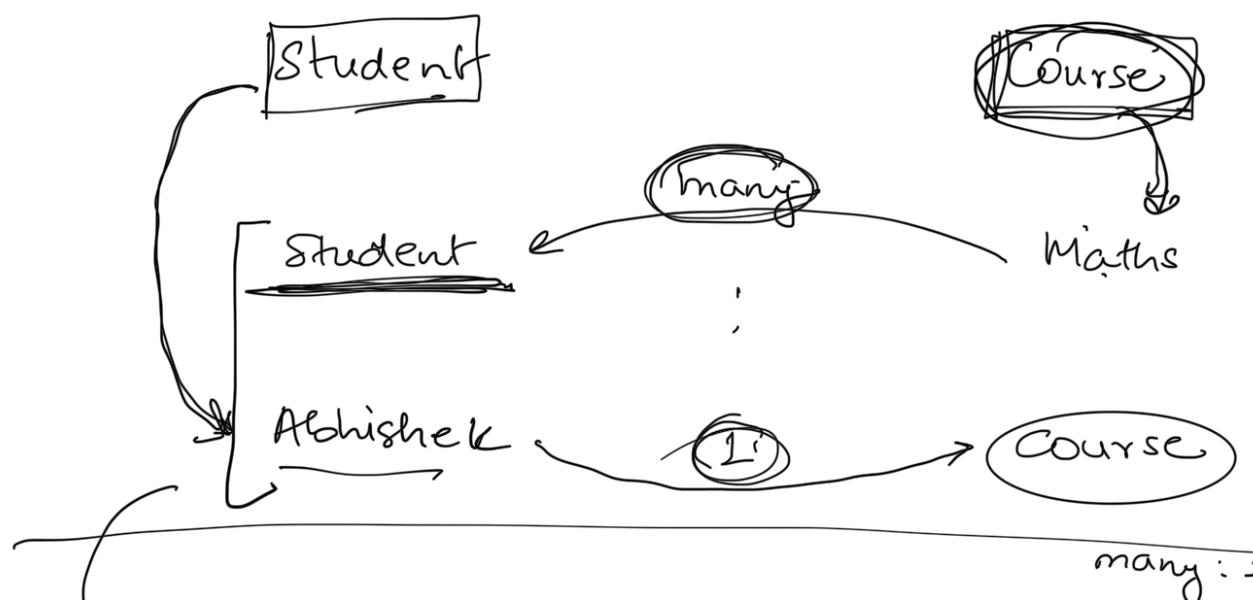




L : many



many = many

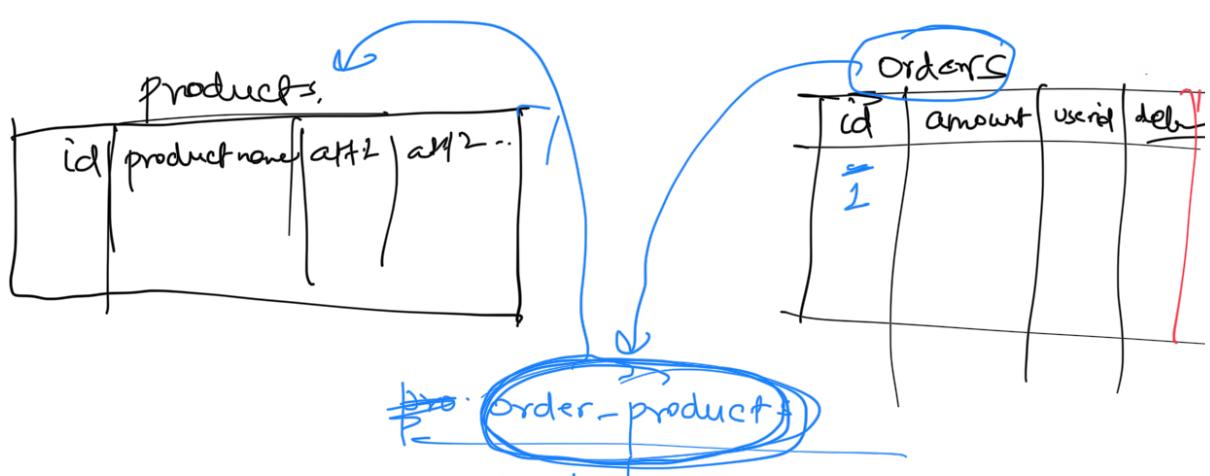
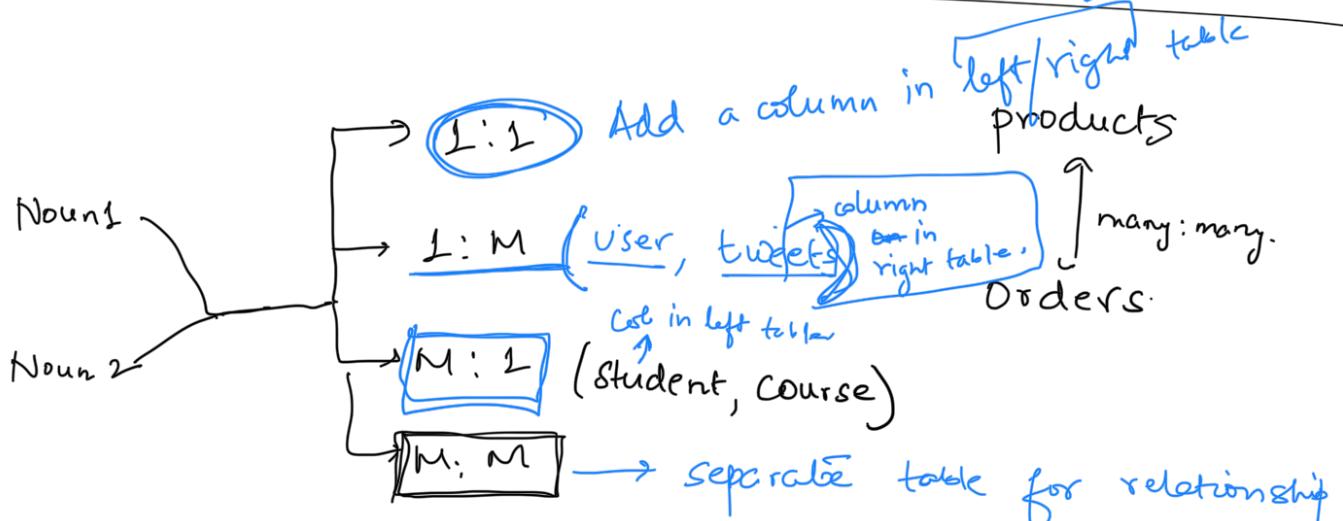
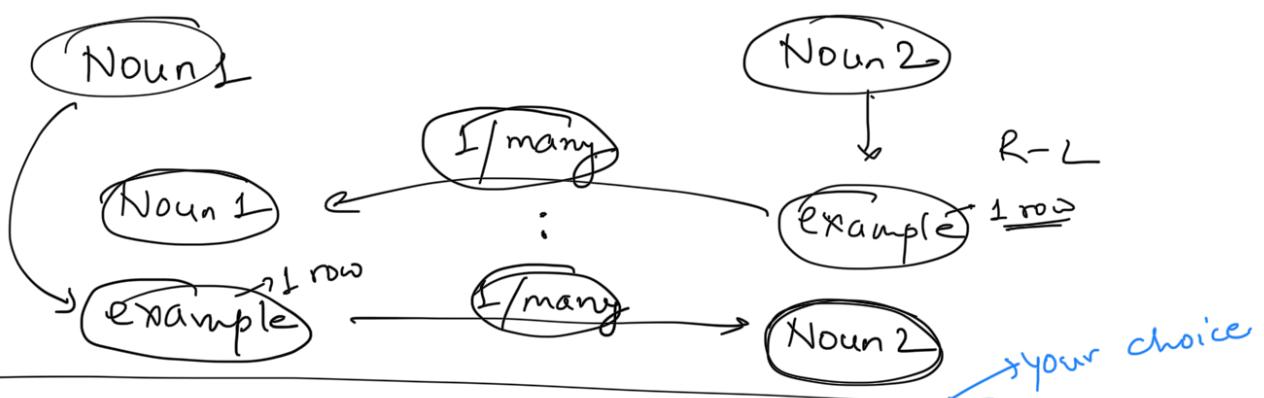
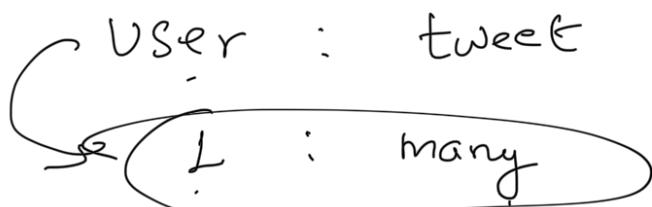
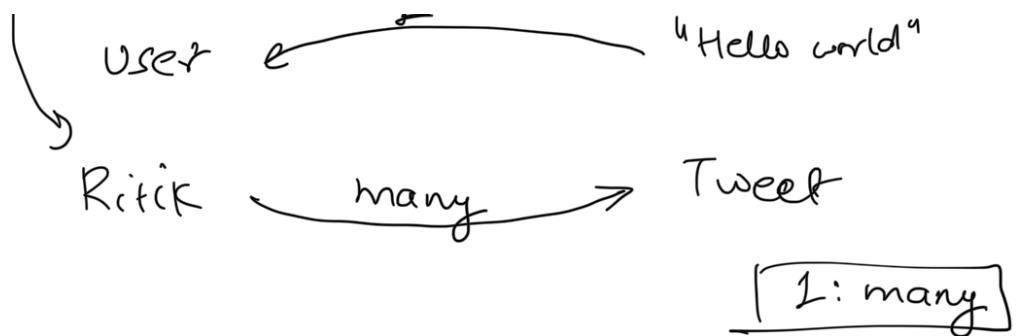


many : 1



(many : 1)





| Order-id | product-id |
|----------|------------|
| 1 | 5 |
| 1 | 6 |
| 1 | 7 |
| 1 | 70 |
| 1 | 90 |
| 2 | 5 |
| 2 | 7 |

multiple tweets

| Users | | | |
|-------|---------|-------|-----|
| id | name | email | ... |
| 18 | Amitesh | ... | - |

single user

| tweets | | | |
|--------|---------|-----------|---------|
| id | content | timestamp | user-id |
| 18 | ... | ... | 18 |

Student

| id | name | email | course-id | | |
|----|------|-------|-----------|---|---|
| | | | = | = | = |
| 1 | ... | ... | | | |
| 2 | ... | ... | | | |
| 3 | ... | ... | | | |

Course

| id | name | desc | ... |
|----|------|------|-----|
| 1 | ... | ... | X |

film

| id | name | duration | release_year | earning |
|----|----------|----------|--------------|---------|
| 1 | Race 3 | 180 | 2019 | 1Cr |
| 2 | 3 Idiots | 190 | 2015 | - |
| 3 | Lagaan | 240 | 2009 | - |

actor

| id | name | height | ... |
|----|-------------|--------|-----|
| 1 | Salman | 5'3 | -- |
| 2 | Damir Khan | 5'7 | -- |
| 3 | Johnny Depp | 5'5 | -- |

