

## Agenda

- aggregate queries
- aggregate functions
- count
- other aggregate funet<sup>n</sup>
- Group by.
- having clause.

[Start at 9:10]

## Aggregate queries

- ways
- how
  - "find the student who ...."
  - "find the batch that ..."
- apply?
- what is average salary of an employee -
  - what was the count of the movies released in a particular year

transation

txnid	vendor	user_id	amount

- average money spent by user\_id!
- Take each user  
(average their spent amount)

### Aggregation

- Uber (cab aggregator).
- Zomato (Restaurant aggregator).
- gather, collect, bring them together

### Aggregate functions

- count, sum, min, max, avg ..

### Aggregate function?

Takes in number of rows and  
spit out a value.

### Count.

- $\text{count}(1, 2, 3, 4, 5) = 5$

id	title	release-year	description

→ Give me all the films that were released last year.



select count(\*) <sup>from</sup> film where release year = 2023

ans = []

in for : filtering (where)

ans (intermediate table):

aggregate.

pseudo :

ans = []

for item in table

filter where .  
count = 0

for row in Table  
count ++.

return count.

Select count(\*), col-name from Table

padding??

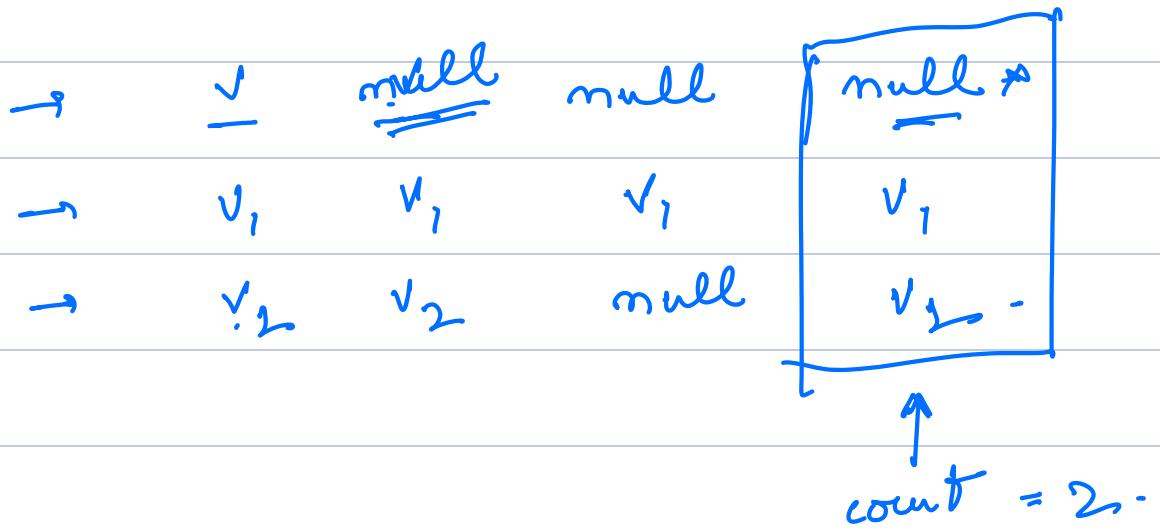
- count (title) = count (\*) ✓
- count (description) = count (\*) - X  
                          nullable  
(not always)

\* ≡ all columns

$$\text{count}(1, 2, 3, \text{null}, 5) = 4.$$

All Aggregate funct<sup>n</sup> only consider  
non - null values

$$\text{count (title)} = \text{count (description)}$$



count(\*)

$[(v, v, \text{null}, \text{null}), (\dots)]$

Ans

(v, null, null, null, ...)

$\rightarrow$  average (1, 2, 3, null, 4)

$$1 + 2 + 3 + 4 = \frac{10}{4} = 2.5.$$

Question

$\rightarrow$  considering students and batches Table  
gives the count of students in  
Batch "A"

select count(\*) from students

in batches

join batches  
on st. batch\_id = b.id  
where b.name = 'A'.

→ select 1 from Table  
padding a colm with 1 ??

→ select count(1) from Table  
|||

select count(\*) from Table

count (static (int/string)).

other aggregate functions

select count(batch\_id), avg(Age)  
from students.

→ Max gives a max value.

→ Min

→ Sum

break till 10:22

Group by .

$[1, 1, 2, 3, 2, 4, 5, 6, 6]$  array.

$[1, 2, 3, 4, 5, 6]$  set.

from_id	vendor	user_id	amount
		1	20
		2	40
		3	60
		1	20
		2	40

$[1, 2, 3]$

Group by essentially breaks the Table into sets and feeds each set to the aggregate funct'.



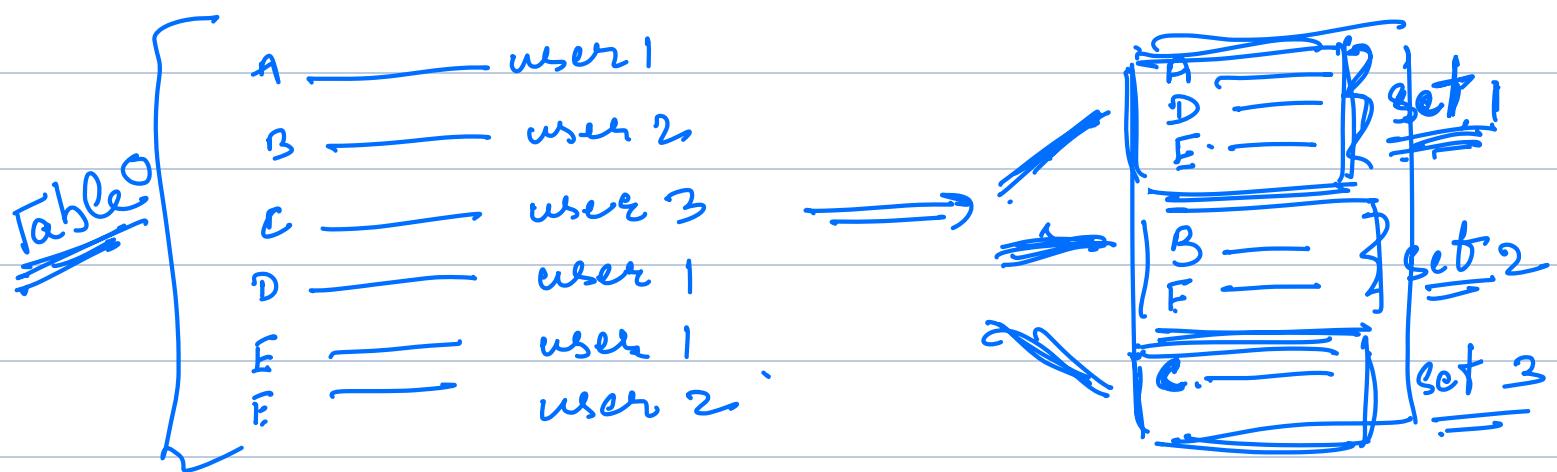
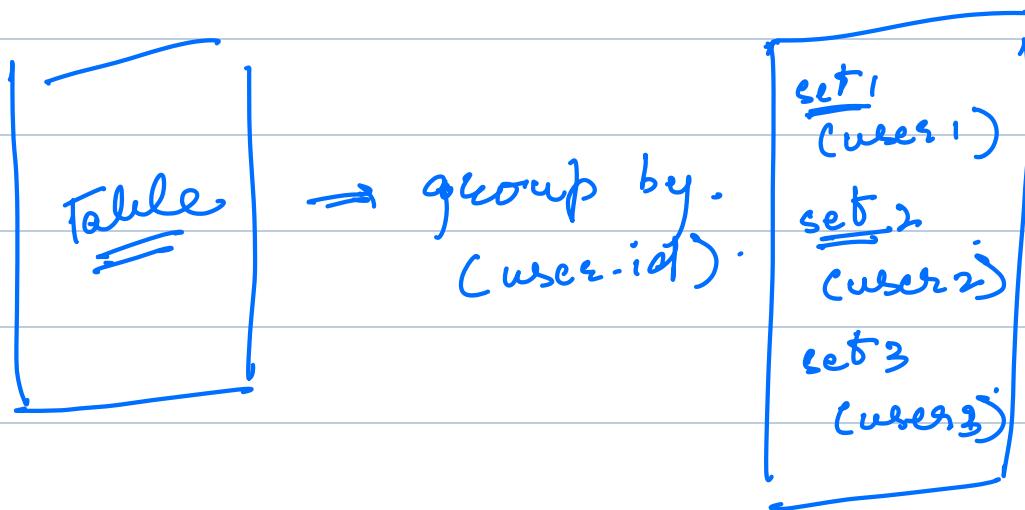
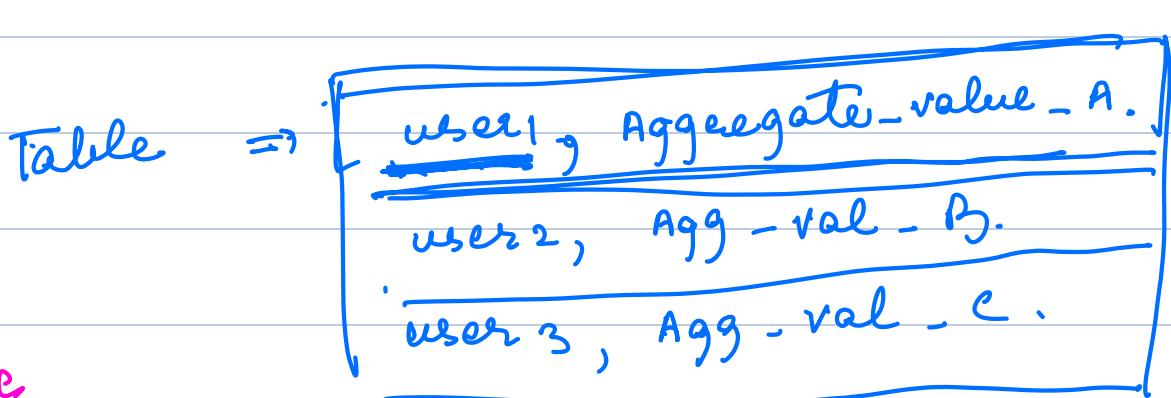


Table 1 (user 1)  $\Rightarrow$  user 1, Aggr( ).

Table 2 (user 2)  $\Rightarrow$  user 2, Aggr( ).

⋮  
⋮  
⋮



Question

→ considering students and batches Table,

+ 2 - 10 interview in all.

give count of all students in all  
the batches?

A  $\rightarrow$  count(students)  
B  $\rightarrow$  count(students)

select count(s.id), b.name

from students s  
join batches b.  
on s.b-id = b.id  
group by b.name.

↳ why can  
we use a  
col<sup>n</sup> name  
here

<del>address</del>	user	country	state	city
T <sub>1</sub>	1	India	Raj	udaipur
T <sub>2</sub>	2	India	Punjab	chandigarh
T <sub>3</sub>	3	America	Ohio	something
T <sub>4</sub>	4	India	Raj	Ajmer
T <sub>5</sub>	5	UK	london	Borough

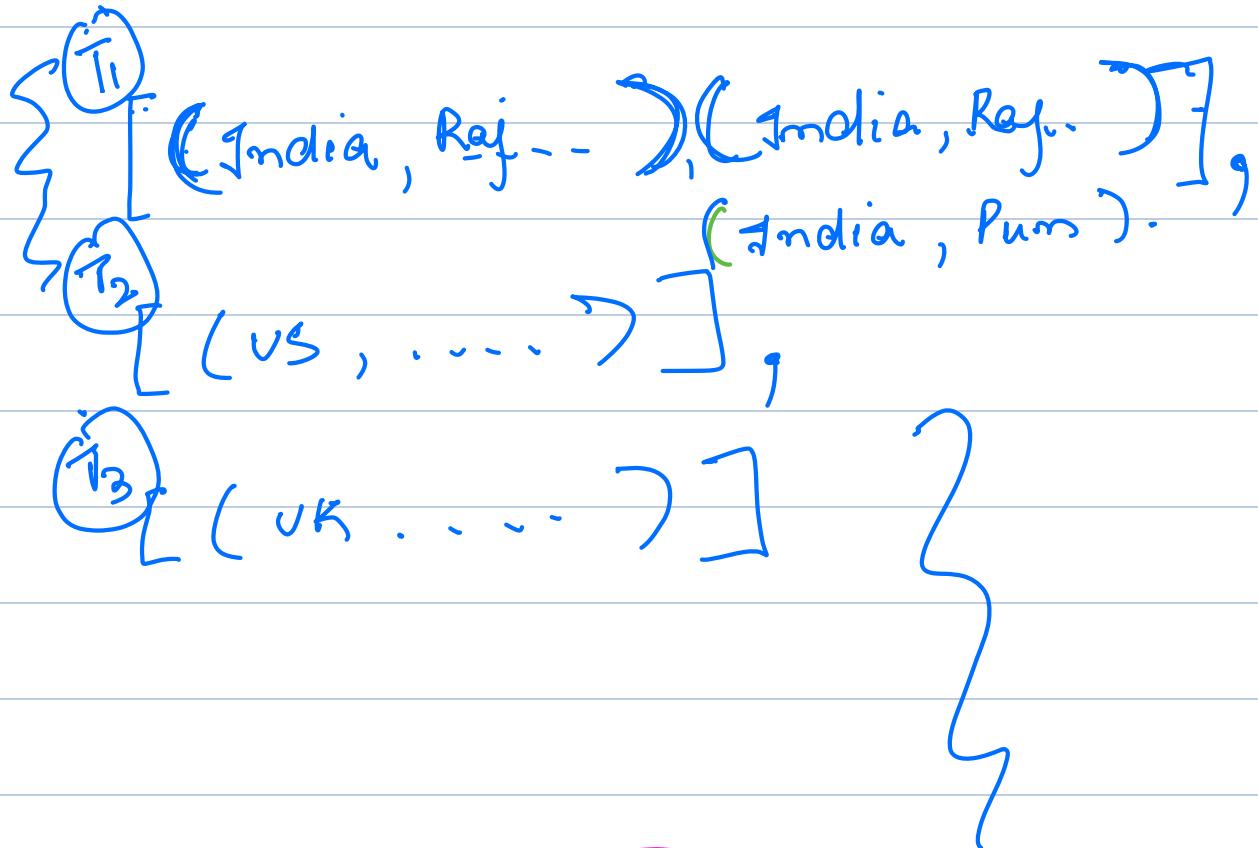
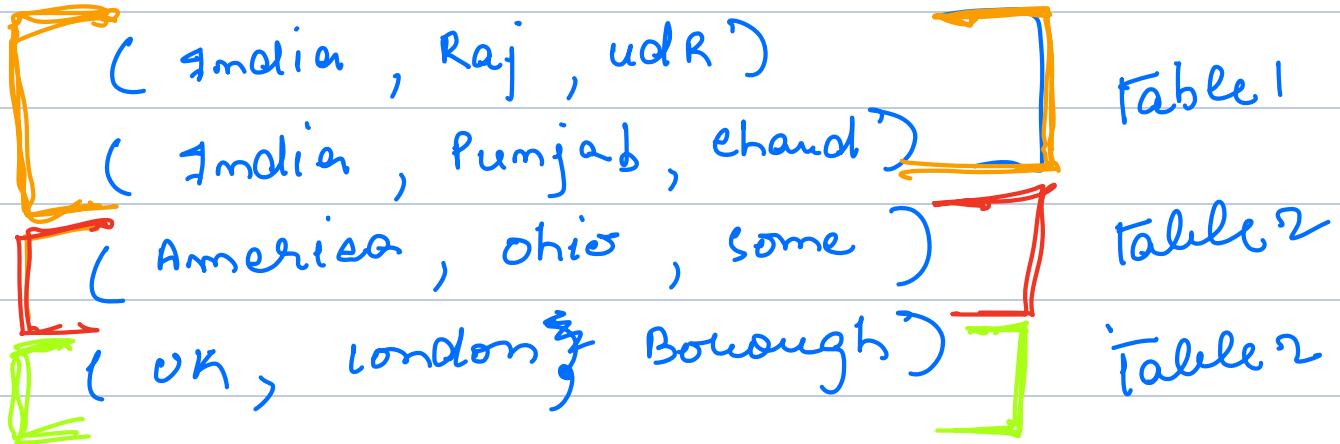
① select count(\*), country from address.

↑  
value      ↑  
multiple

(SQL goes boom boom)

ERORH

② Select count(\*) as howMany , country  
 from address  
 group by country



3	India
1	vs
1	UK.

to state

→ Select count(\*) as how many , country , state  
from address  
group by country , state .

$T_1 \left\{ \begin{array}{l} T_1' [ (India, Raj', ... ) - , (India, Raj' ... ) ] \\ T_1'' [ (India, Punjab) ] \end{array} \right\}$

$T_1' \text{ (agg) } ?$   
 $T_1'' \text{ (agg) } ?$

→ we create a multi-set of country ,  
and then of state , and then  
apply aggregate functn.

set of sets

Having

Having is used to filter Groups

Question

Point out names that have more

Than 100 students along with count of students is

students

id name batch\_id

batches

id name

select count(s.id), b.name  
from students s.

Join batches b

on s.batch\_id = b.id

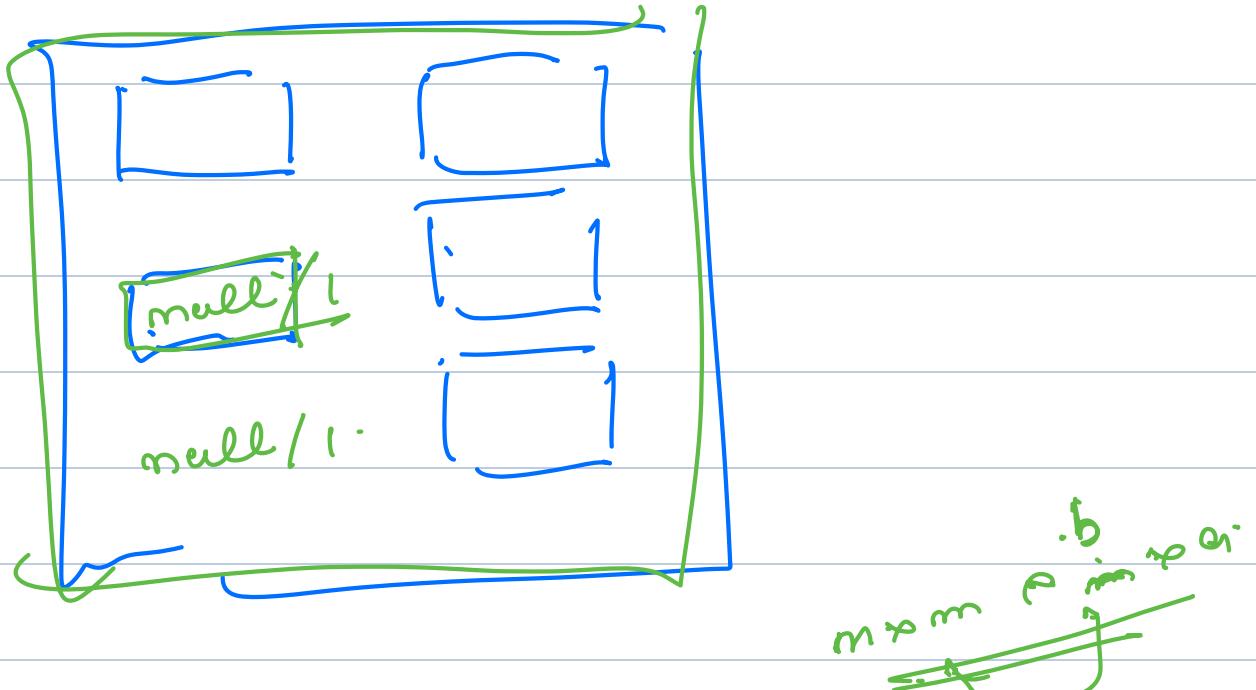
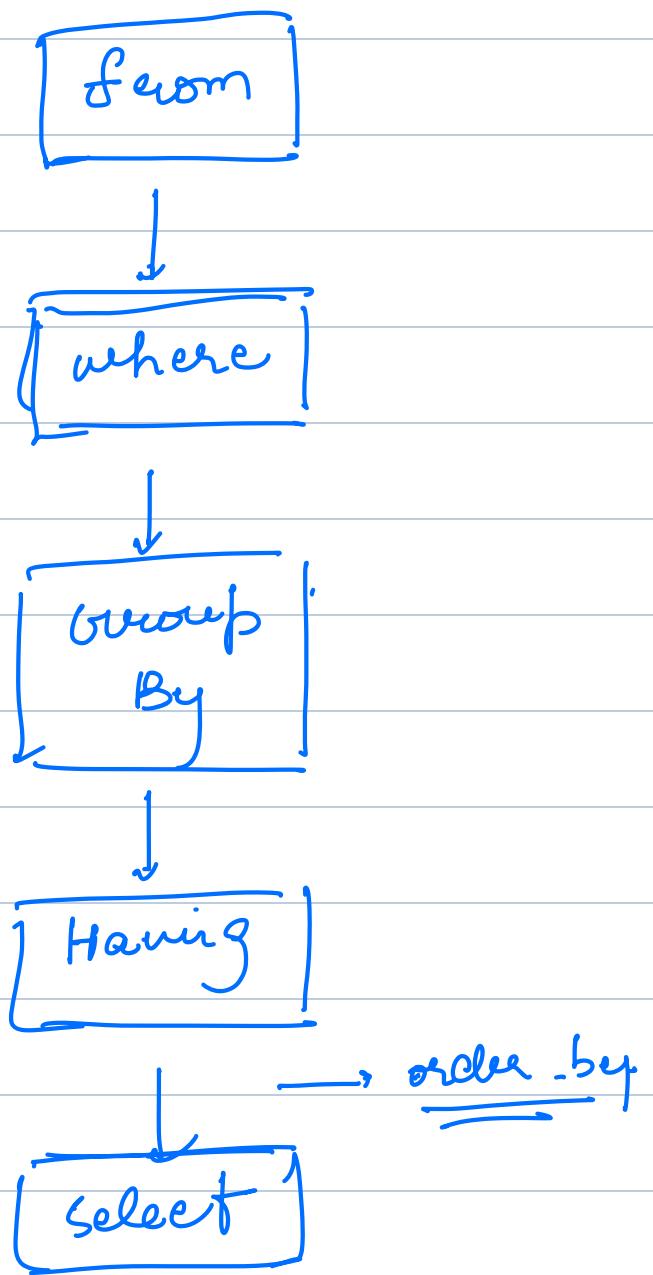
Group by b.name

having  $\text{count}(s.id) > 100$  | math

where ?

The sequence in which query executes

- ① Join
- ② where ↗
- ③ divide into groups.
- ④ Having (filter groups)
- ⑤ Pointed Through select.



~~ME~~

{ $m - b$ }