

# Agenda

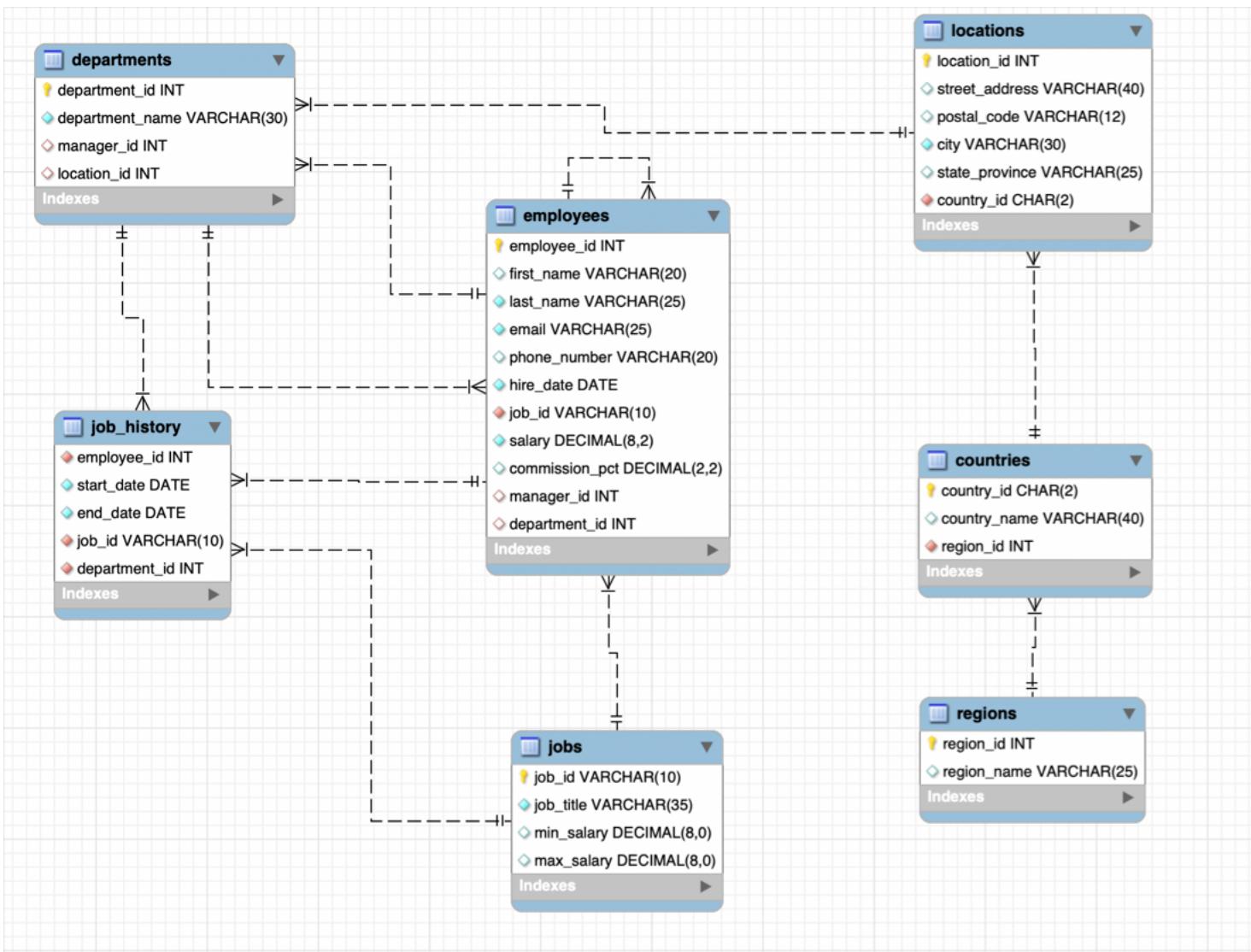
## 1. Window Functions

### 1. Aggregation Types

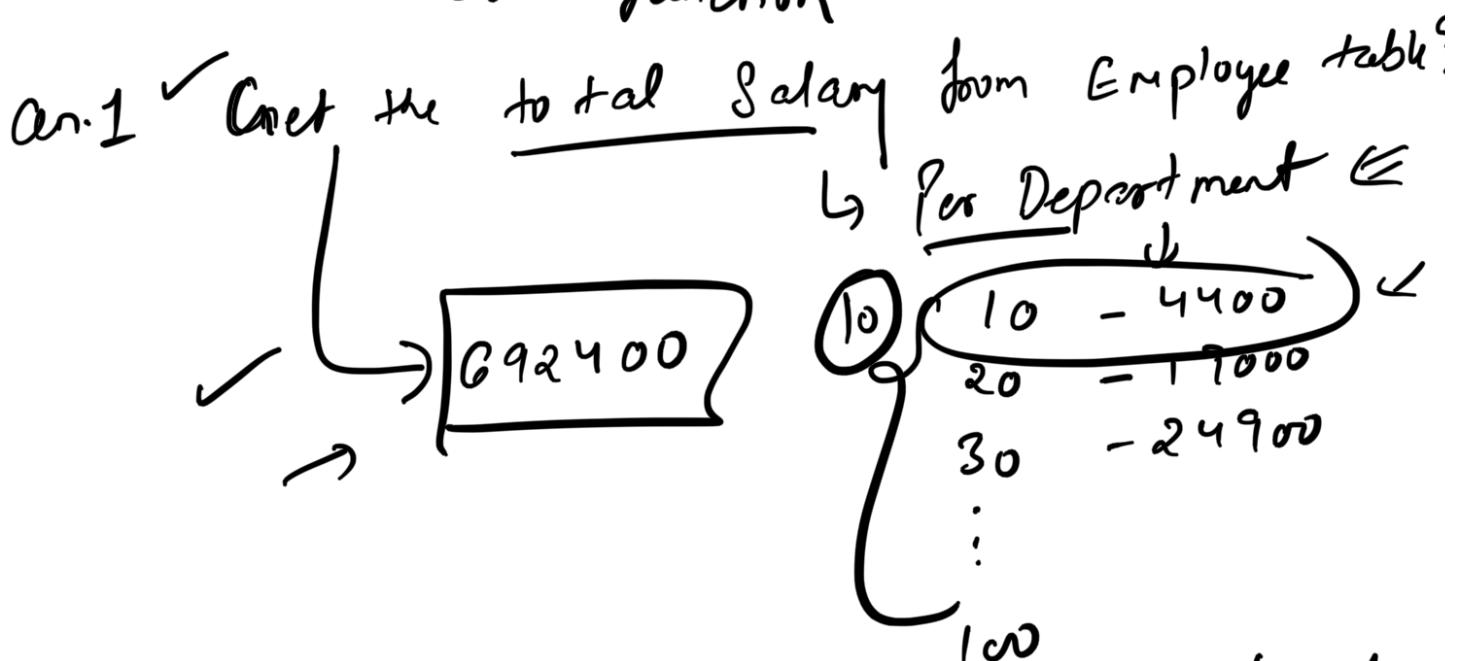
1. Sum
2. Min
3. Max
4. Count
5. Average

### 2. Analytical Types

1. row number
2. rank
3. dense rank
4. lead,lag
5. ntile
6. nth\_value, first\_value, last\_value



## Window function



② → Get the total salary per Department wise and into same <sup>row</sup> <sub>Salary</sub>.

1	10	1000	4400
2	10	2000	4400
3	10	1000	4400
4	10	4000	4400

③ → Subquery + Group By ↲

④ → Self Join + Group By ↲

① Window function ↲

→ 2 × Subquery ↲  
 → 1.5 × Joins ↲

① Aggregation functions

$\text{Sum} / \text{Avg} / \text{Count} / \text{Min} / \text{Max}$

Date

Partition by date

Sales

	employees	date	Sale	total-sels
→ ①	A	01/03	200-	900
②	B	01/03	400-	1200
→ ①	A	01/04	300-	900
②	B	01/04	300	1200
→ ①	A	01/05	400-	900
②	B	01/05	500	1200

① Get the total Sales across tabu

$A = 900$   
 $B = 1200$

OVER()

Select  
 EMP-ID, Sales, Date,  
Sum(Sale) OVER() AS total-Sales  
 From Sales;

→ OVER (partition by employee);      @ Partition by  
 @ Order by

...OVER()  
 ↗ -1 ↗ w1

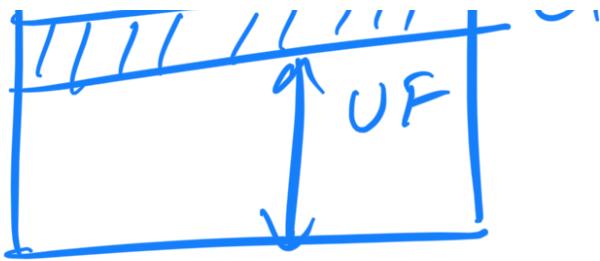


Frames Range between unbounded preceding  
and Current Row

$$\begin{aligned} \rightarrow UP = 0, 200 &\Rightarrow \text{Sum}(\text{Sal}) \Rightarrow 200 \\ \rightarrow UP = 200, 300 &\Rightarrow \text{Sum}(\text{Sal}) \Rightarrow 500 \\ &\quad \text{Sum}(\text{Sal}) = 900 \end{aligned}$$

$200$   $300$   $400$





Sum(Sales) over (Partition by emp order by sale)

Range between ↑ 2 Preceding and ↓ 1 Following

Emp	Sale	Date	total_Sale
A	400	01	500
B	500	01	
A	300	02	
A	200	02	
A	450	03	
B	300	03	
A	200	04	

A   200   04	?	
A   300   02	?	
A   400   01	?	
A   450   03	?	

Sales =  $P = 500 \quad F = 450 \quad CR = 400 \Rightarrow \underline{1350}$

RANGE → date

Sum(Sale) < over (order by date)

Range b/w JF and CR

ROWS

A	200	01	700
B	500	01	700
A	300	02	1000
A	400	03	1400
			Rov
	200	700	700
	700	700	700
	1000	1000	1000
			1400

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## Analytical functions

① Row-number

$\Rightarrow$  FB dept\_id  
order by salary

	A	B	C	D	E	F	G	H	I	J	K
	400										
1		300									
2			200								
3				600							
4					600						
5						800					
6							1800				
7								1800			
8									600		
9										400	
10											400

② Rank

rank(1)  
over  
(P B dept\_id  
order by salary  
desc)

	Salary	row-number	Rank	Dense-Rank
A	4800	1	1	1
B	4800	2	1	1
C	4800	3	1	1
D	5000	4	4	2
E	5000	5	5	3
F	5500	6	5	3
G	6000	7	7	4

③ Dense-Rank

1	3
2	0

player-id	match-day	winning	streak	result	rank
13	13	W	1	W	1
14	14	L	0	L	2

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rank()  
over CPD p12<sup>t</sup>  
or 2 by rank 2x2

rank()  
over CPD p12<sup>t</sup>  
or 2 by rank 2

1	17	-0	w	3	3
1	16	(3)	L	1	4
1	18	D	w	4	5
1	20	O	L	1	1
2	18	O	D	2	2
2	19	O	A	1	1
3	18	O	w	2	2
3	21	O	w	1	3
3	22	2	L	1	4
3	23	2	L	2	4

AI  
mentalism

$G$   
 $L$

more (dim)  
 ConvP by Pid.

1      L  
 2      1  
 3      1  
 4      4  
 5      5  
 6      6  
 7      7  
 8      8

