What are window functions?

Window functions in SOL are a type of analytical function that perform calculations across a set of Sow that are related to the current now, called " window". A window function calculates à value for each now in the result set based on a subset of the now that are defined by a window sperification The window specification is defined using the OVERC) clause in SQL, which specifies the partioning and ordering of the ions into groups based on a

nothin each group. SELECT branch, Aver Cmarks)

Specific column or enpression, volville the ordering

defines the order in which the row are processed

PROM marks GROUP BY branch

		011-0-01			, Nitish	EE F.	82
Student_id	manne	brauch			1 2 -	886	91
	Nitish	€EE	82	(who	3	n 143	69
1	1 1 1 1 1 1 1	EEF	91		4 16-	h	55
2	Rishabh	eet	69	1			
3	Anukant		55	13 6	N. W. A.		
4	Rupesh	EEE			My and of		
	Shubham	CSE .	78	-			50
5		0.46	43	- 4	5 Shubbar	CSE	38
6	ved	CRE		1 80	A. 19	in l	43
7	Deepak	LSE	98	3	6	4	98
8	Arpan	CSE	95	la caraci	4		,95
•	, , , ,				8 5	n	
	,				,	100	

branch	Auch (marks)
ese	78,5000
EEE)	74, 2500

SELECT *

AVG(marks) OVER [PARTITION by branch)

FROM marks

	99	branch	marks	AVGICIMATION
Stalid	name		- 001	78.500
Diociti	1 - 57	EEB		
-		EEE	-	74.5vo
	40, 108	4 771	r to sent 1,0	78.500
	2	666		
•	-		- Cl_21	89.750
-	1	CAB	- 1	
79	N. F. Land	CSE		89. 250
		CSC	2	
1.511.00	100	CSE	24 24	89.750
¥1	1 1 W	CSC		
-	10.24 G / / / /	B 10 / 1	10	

Aggregate function with OVERUS

find all the students who have marks brighter than the any marks of their respectives branch.

SELECT * FROM L

SELECT *, Aug (marks) OVER CPARTITION BY branch) AS 'angg' FROM Campus. marks)t

WHERE t. marks > t. augg

RANK/DENSE - RANK/ROW-Number

Show of

of reach branch (RANK)

of reach branch (RANK)

all rank according to the marks.

SELECT *,

RANK () OVER (PARTITION BY branch ORDER BY marks DESC)

FROM Campus. marks

				. 10 10 1
Sta-id	name	branch	marks	
٦ ·	•	CSE !	95	2
8 5	5 h	csE	7e 43	3
6		CSE	95	1
9	•	ECE	95	1
10	*	ECE	88	3 4
[]	-	ELE	81	
2		MECH	91	1
1		MECH	82	2
3 4		MECH	55	4

If mark is same

from both rank is

same (cike 1 ad 1)

and then next rank

will be start from 3

not 2.

(Dense-rank)

mark	Rank	Dense-rank
95	1	1
95	1	1
89	3	
	diffe	una A

SELECT *,

PANKEY DENSE_RANK () OVER (PARTITION 134 branch ORDER BY

marks DESC)

from campus. many

ROW-NUMBER)

SELECT *

ROW-NUMBER () ONBR CPARTITION BY BRANCH)

campus - marks

84d-1'd	Name		marks	Row-Number
7	•	CSE	- 10	Row Number
8	•	"		3
5	-	"		4]
6		ECE	-	17
12	135	n	-	2 Row Nuto
		n	-	3
10	-	n	-	4
2	-	Месн	-	17
1	-	א	-	2 Row Number
3	-	» и		3]
4 "		• 1		

CIRST_VALUE / LAST_VALUE

Arst_value

first now show highest marks

SELECT *,

and create another column to show highest marks

FIRST_VALUE (marks) OVER (ORDER BY marks DESC)

ppor campaus mans

	1 Name	branch	marks	Pfrst Value
Staid	700000		98	98
7	-	1	92	98
ę		-	91	98
3		40	90	98
2	ı '			
		Fra	nes	
Rows The Re included enample includes	ibination and BE ows Cl in the , Rows the a	window tition the on value of two rween ause of frame PRECEDI	function at detendent The clauses belative much on and	is a subset of Rows nines the scope of the nines the scope of the using in the window functions in the window functions we many nows should be to the current now. For ans that the frame the flire how that he boundaries of the frame.
The BE	TWEEN	Clause	7 14	tion
Example	Proposition .		1000	DECEDING AND CURPENT ROW:
· Rows	BETWEE	N NNBO	UNDED	cludes all rows from the
means	that	the fr	ane m	p to and including the
loegnin	g of t	are par	tition ru	100
0.19301.1	e eou.			Anst and the
int the		000	823	- ar
Cinst 1 2	Nigh	€ 6 6	101	MUVNET NOW
0 003 / 2	Rupesh	EEE	***	69
nov \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	ankit	666		himen low 63
4	Rishat	6 5 8	55	
	1			

we have to find last low

ROWS between 1 PRECEDING AND 1 FOLLOWING: the forme Includes the current sow and the some immediately before and after it.

6

	Nitish	12 R.B	82 First
2	Ristrabh	EEE	91 start
3	Ankit	EEE	69
4	Rupesh	EEE	55

ROWS BETWEEN UNBOUNDED PRECEDING AND UNBOUNDED POUDING: the fearme include all nows in the partition.

The first first first first first first

2	Rishabh	EEE	1	, e.
3	onkit	EEE	69	
4	Rupesh	E E E	55-	1

· ROWS - BETWEEN 3 PRECEDING AND 2 FOLLOWING: the frame includes the weent now and the three row before it and the two nows after it.

	7 83 1	4176 .1	A FINT
1	1 Nitien 1	EEE	82 find
10	Rishabh	EEE	91
72	Ankit	EEE	69
4	Rupesh	66E	55 Jat
		- Produces	

SFLELT *

FREST LAST_VALUE (Manue) OVER CPARTITION BY Granch ORDE BY marks DESC

ROWS BETWEEN UNBOUNDED PRECEDING AND UNBOUNDED following)

marks. PROM

	1	h. a. eta l	markel	OVERL	PARI
Stalid	mame	ese	98	73	
7		CSE	45	73	
8	-	CSE	73	73	de de
5	-		72	54	100
12	-	EEE	63	54	
1		933	54	54	
1		કેકકે	39	3 1	

NTH VALUE

SELECT * ,

NTH_VALUE (Name, 2)

OVER [PARTITION BY Branch ORDER BY

marks DESL

ROWS BETWEEN UNBOUNDED PROCEDING AN UNBOUNDED POLLOWING)

PROM

Sta-i'd name Cranch mans 95	Marine		oldi det.		2 nd value	
CSC	الهندين	nance	branch	marks	2	
	Sta-19		CSE	21		
(45)	4	25112	CSE	(A5)	95	
5 - CSE 73 73	5		CSE	73	99	
6	1	_		63	54	
12 - EEE (4) 54	12	- "	V-	64)	54	
€€€ 29 54	;		€€€	29	54	

find name and branch of Topper.

SELELT name, beance, marks

FROM (

SELECT *,

FIRST_VALUE (name) OVER (PARTITION BY branch ORDER BY marks DESL) As 'Topper'

FROM campus. marks) t WHERE name = t. Topper

orane.	branch	marks
Deepak	CSE	98
Viney	ECE	95
Rishabh	565	91
Prashaut	MECH	45

OF

SELECT mane, branch, mark from CSELECT *, LAST_VALUE Channey OVER W AS 'Topper'

FROM campons. marks)t

WHERE man z topp

WINDOW W AS CPARTITION BY branch ORDER BY Marks ROWS BETWEEN UNBOUNDED PRECEDING

0

0

2

AND UNBOUNDED FOLLOWING)

LEAD 2 LAG

LAG

SELECT *,

-6

(m.

LAG (marks) OVER (ORDER BY student_id)

from marks

o \	Name	branch	marks	[AG(Warks)]
Student-i'd	V 0,000 C		0.0	NULL
1	Nitish	EEE	82	
. 2	Ristrabh	EEE	91	82
3	Ankit	EEE	69	q I
4	Rupesh	CSE	55	69
5	Shubhan	CSE	75	55
6	Ved	CSE	78	72

LEAD

SELECT *,

LEAD (marks) DUER (DRDER BY student-id)

from marks

Student-id	Name	branch	marks	LEAD CHOOL
	Nitish	666	82	91
1	Rishabh	EEE	91	64
2	an bit	EEE	69	55
3 4	Rupeth	ese	55	75
5	Shubham	cs€	75	78
6	Ved	CSE	78	NULL