

3) What are aggregate functions what are its types?

↳ Aggregate functions are functions, which takes (multiple inputs) and returns (single output).

→ Types of Aggregate Functions:

↳ sum() → returns the total value.

↳ count() → count the (no. of rows)

↳ max() → returns the maximum value

↳ min() → returns the minimum value

↳ Avg() → returns the average value

→ Aggregate functions coding implementations?

```
5. select sum(salary) as `Total salary`,  
6 max(salary) as `Max salary`, min(salary) as `Min salary`,  
7 avg(salary) as `Average salary`, count(salary) as `Total no of salaries`  
8 from salaries;
```

<   Filter Rows: Export:  Wrap Cell Content: 

	Total salary	Max salary	Min salary	Average salary	Total no of salaries
▶	61678125784	158220	38735	63761.2043	967330

4) What is groupby

○ groupby is used to split your data into groups

○ Based on a certain criteria

→ How groupby works:

↳ There are three main steps:

(i) Splitting the data into groups

(ii) Applying aggregation functions for each group

(iii) Combining the result

→ This is how groupby works

→ Grouping Data based on single column ?

26. `select * from salaries2 order by emp_name;`

27

emp_no	emp_name	salary
2	jaanu	50000
2	jaanu	70000
3	lakshith	40000
1	lavanya	50000
1	lavanya	60000
1	lavanya	80000
4	sanjana	100000

29. `select emp_name, sum(salary) as 'Total salary'`
30 `from salaries2`
31 `group by emp_name;`

emp_name	Total salary
lavanya	190000
jaanu	120000
lakshith	40000
sanjana	100000

→ from this data we form (4-groups)

→ (Lavanya, jaanu, lakshith, sanjana).

→ Because here grouping is happen based on (emp-name)

→ example 2

26. `select * from salaries2 order by emp_name;`

27

emp_no	emp_name	salary
2	jaanu	50000
2	jaanu	70000
3	lakshith	40000
1	lavanya	50000
1	lavanya	60000
1	lavanya	80000
4	sanjana	100000

33. `select emp_no, sum(salary) as `Total salary``

34 `from salaries2`

35 `group by emp_no;`

36

emp_no	Total salary
1	190000
2	120000
3	40000
4	100000

→ Grouping data based on multiple columns?

```
37. select * from salaries2;
```

emp_no	emp_name	salary
1	lavanya	50000
2	jaanu	50000
1	lavanya	60000
2	jaanu	70000
1	lavanya	80000
3	lakshith	40000
4	sanjana	100000

```
47. select emp_no, emp_name, sum(salary) as `Total salary`,  
48 max(salary) as `max salary`, min(salary) as `min salary`,  
49 avg(salary) as `average salary`  
50 from salaries2  
51 group by emp_no, emp_name;
```

emp_no	emp_name	Total salary	max salary	min salary	average salary
1	lavanya	190000	80000	50000	63333.3333
2	jaanu	120000	70000	50000	60000.0000
3	lakshith	40000	40000	40000	40000.0000
4	sanjana	100000	100000	100000	100000.0000

Here grouping is happens based on the columns (emp-no) and (emp-name).

→ How to filter the data after grouping?

```
37. select * from salaries2;
```

emp_no	emp_name	salary
1	lavanya	50000
2	jaanu	50000
1	lavanya	60000
2	jaanu	70000
1	lavanya	80000
3	lakshith	40000
4	sanjana	100000

emp_no	emp_name	Total salary	max salary	min salary	average salary
1	lavanya	190000	80000	50000	63333.3333
2	jaanu	120000	70000	50000	60000.0000
3	lakshith	40000	40000	40000	40000.0000
4	sanjana	100000	100000	100000	100000.0000

```
47. select emp_no, emp_name, sum(salary) as `Total salary`,  
48 max(salary) as `max salary`, min(salary) as `min salary`,  
49 avg(salary) as `average salary`  
50 from salaries2  
51 group by emp_no, emp_name  
52 having `Total salary` > 110000;
```

emp_no	emp_name	Total salary	max salary	min salary	average salary
1	lavanya	190000	80000	50000	63333.3333
2	jaanu	120000	70000	50000	60000.0000

→ Having is used to filter the data after grouping

→ how to filter the data before grouping?

26. `select * from salaries2 order by emp_name;`

emp_no	emp_name	salary
2	jaanu	50000
2	jaanu	70000
3	lakshith	40000
1	lavanya	50000
1	lavanya	60000
1	lavanya	80000
4	sanjana	100000

47. `select emp_no, emp_name, sum(salary) as 'Total salary',`
48 `max(salary) as 'max salary', min(salary) as 'min salary',`
49 `avg(salary) as 'average salary'`
50 `from salaries2`
51 `where emp_name not in('jaanu')`
52 `group by emp_no, emp_name;`

emp_no	emp_name	Total salary	max salary	min salary	average salary
1	lavanya	190000	80000	50000	63333.3333
3	lakshith	40000	40000	40000	40000.0000
4	sanjana	100000	100000	100000	100000.0000

↳ where is used to filter the data before grouping
here we grouping All data other than `emp_name = jaanu`

→ how to use both where & having along with group by ?

37. `select * from salaries2;`

emp_no	emp_name	salary
1	lavanya	50000
2	jaanu	50000
1	lavanya	60000
2	jaanu	70000
1	lavanya	80000
3	lakshith	40000
4	sanjana	100000

After Applying
where condition

emp_no	emp_name	Total salary	max salary	min salary	average salary
1	lavanya	190000	80000	50000	63333.3333
2	jaanu	120000	70000	50000	60000.0000

```
39. select emp_no, emp_name, sum(salary) as `Total salary`,  
40 max(salary) as `max salary`, min(salary) as `min salary`,  
41 avg(salary) as `average salary`  
42 from salaries2  
43 where emp_name not in('lakshith', 'sanjana')  
44 group by emp_no, emp_name  
45 having `max salary` > 75000;
```

emp_no	emp_name	Total salary	max salary	min salary	average salary
1	lavanya	190000	80000	50000	63333.3333

Note : where should be used Above
group by
○ having should be use below the
group by

→ Diff between where & Having?

where

↳ where is used
To filter the data
Before grouping the
Data

↳ because where executes
Before group by

HAVING

↳ Having is used to filter
the data After grouping
The Data

↳ Because having executes
After group by