Aggregate Functions

In this session, you will learn:

- What is an Aggregate Functions?
- List of Aggregate Functions with example queries

Aggregate Functions

- An aggregate function performs a calculation on a set of values and returns a single value.

  - ✓ Count()
  - ✓ Sum()
  - ✓ Avg()
  - ✓ Max()
  - ✓ Min()

Aggregate Function – Count()

- returns the number of rows present in the table either based on some condition or without condition.

Example

```
SELECT count(*) AS Customer_Count
from Customer WHERE City IN (‘Chennai’,’CBE’);
```

Customer

Customer _Id	FirstName	Street	City	Zip_Code	Phone
100	ABC	Central	Chennai	641088	9852754812
101	XYZ	Velacherry	Chennai	641088	5872526262
103	FEG	Lakeview	Ooty	465424	4541565996
102	PQR	PNP	CBE	641323	8893992919
106	MNO	Electronic	Bangalore	666743	8173578292

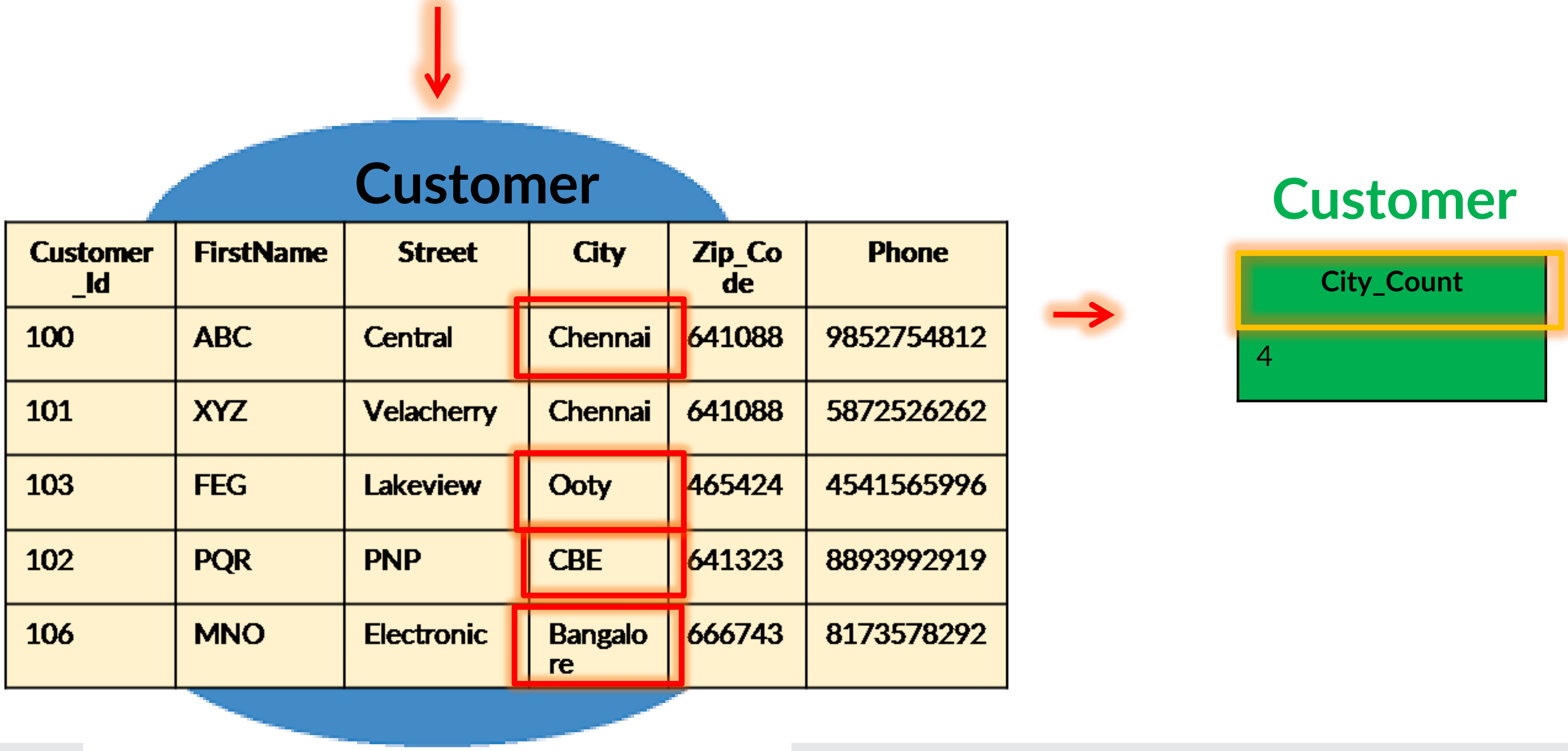
Customer

Customer_Count
3

Aggregate Function – Count()

Example

SELECT count(DISTINCT City) AS City_Count
from Customer



Customer

Customer _Id	FirstName	Street	City	Zip_Code	Phone
100	ABC	Central	Chennai	641088	9852754812
101	XYZ	Velacherry	Chennai	641088	5872526262
103	FEG	Lakeview	Ooty	465424	4541565996
102	PQR	PNP	CBE	641323	8893992919
106	MNO	Electronic	Bangalore	666743	8173578292

Customer

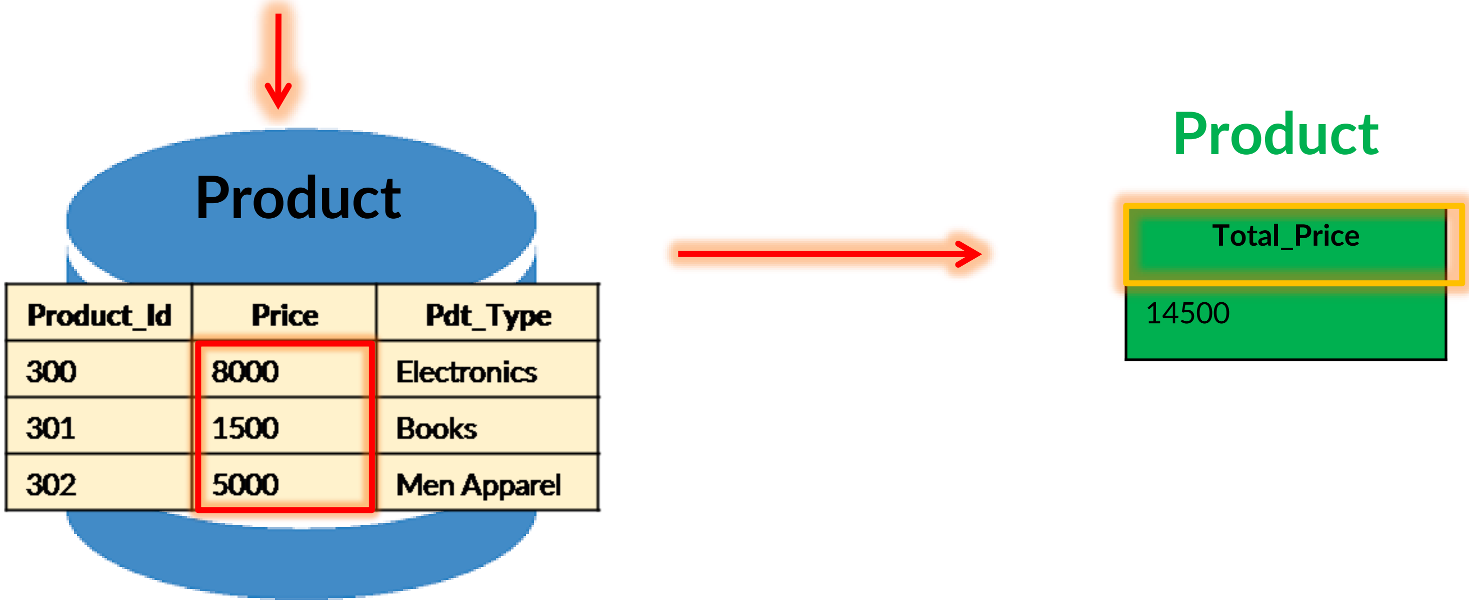
City_Count
4

Aggregate Function – Sum()

- returns total sum of a selected columns numeric values.

Example

```
SELECT Sum(Price) AS Total_Price
from Product
```



Product

Product_Id	Price	Pdt_Type
300	8000	Electronics
301	1500	Books
302	5000	Men Apparel

Product

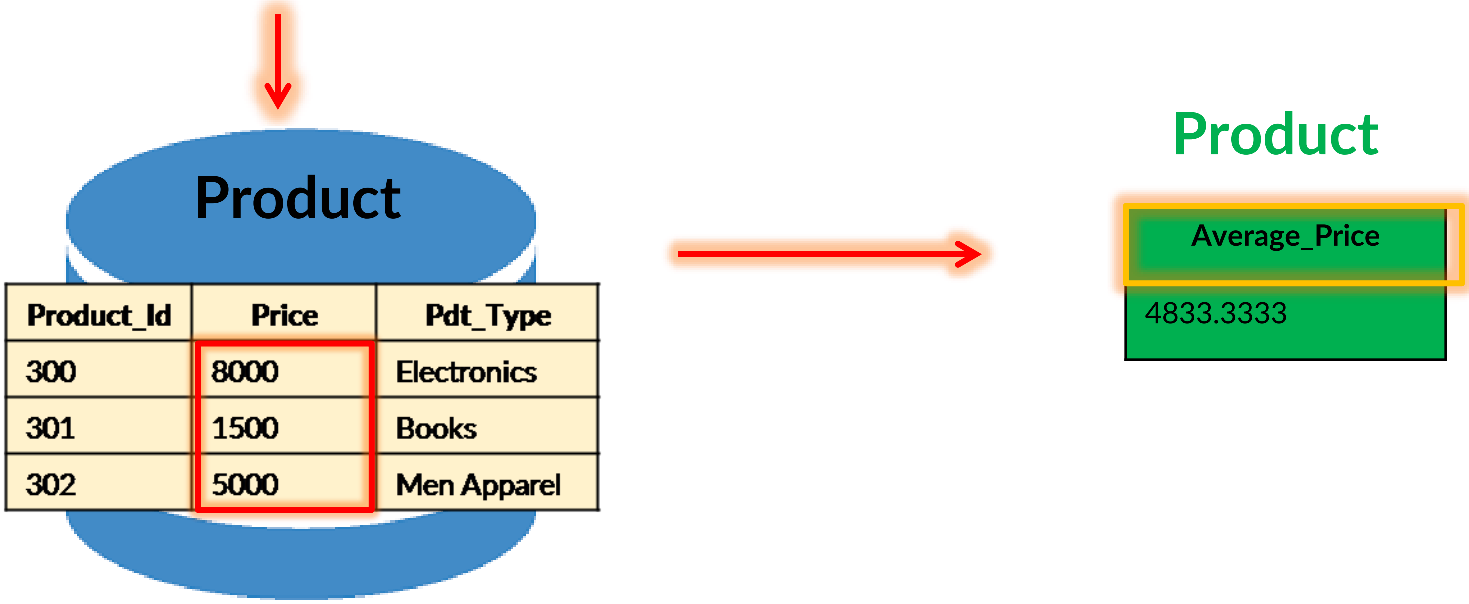
Total_Price
14500

Aggregate Function – Avg()

- Calculates the average value of a column of numeric type.

Example

```
SELECT Avg(Price) AS Average_Price
from Product
```



Product

Product_Id	Price	Pdt_Type
300	8000	Electronics
301	1500	Books
302	5000	Men Apparel

Product

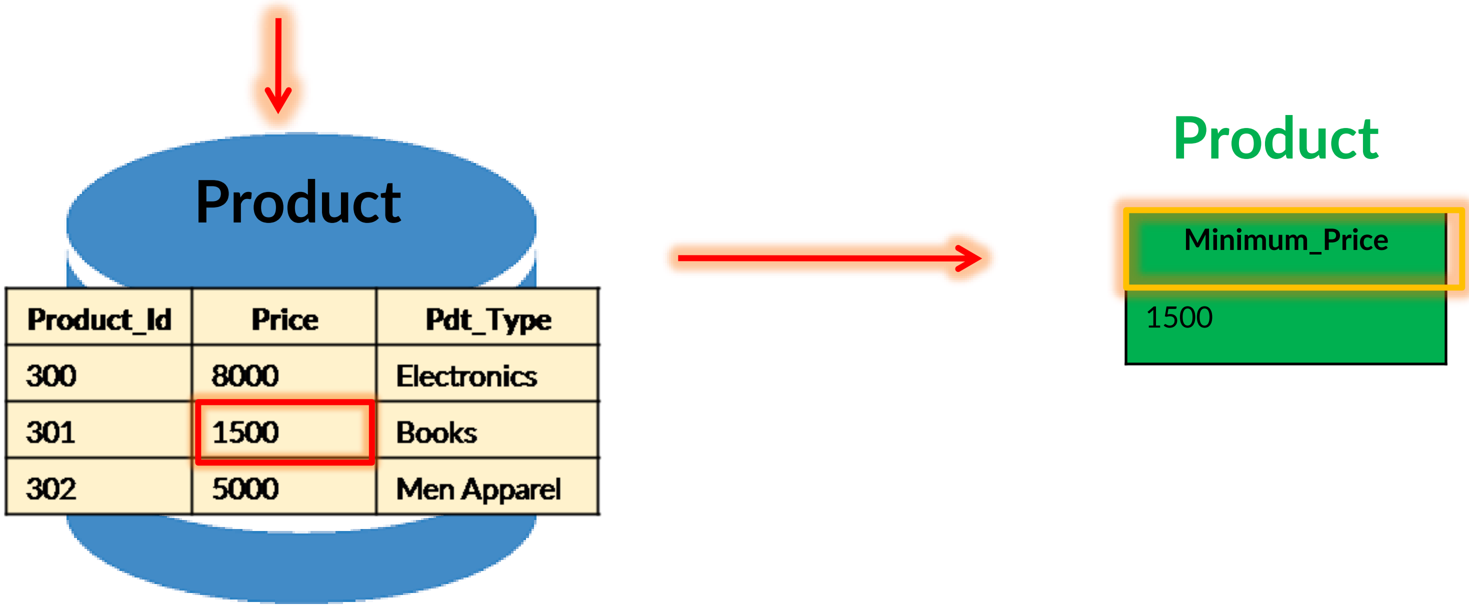
Average_Price
4833.3333

Aggregate Function – Min()

- returns minimum value from a selected column of the table

Example

```
SELECT Min(Price) AS Minimum_Price
from Product
```



Product_Id	Price	Pdt_Type
300	8000	Electronics
301	1500	Books
302	5000	Men Apparel

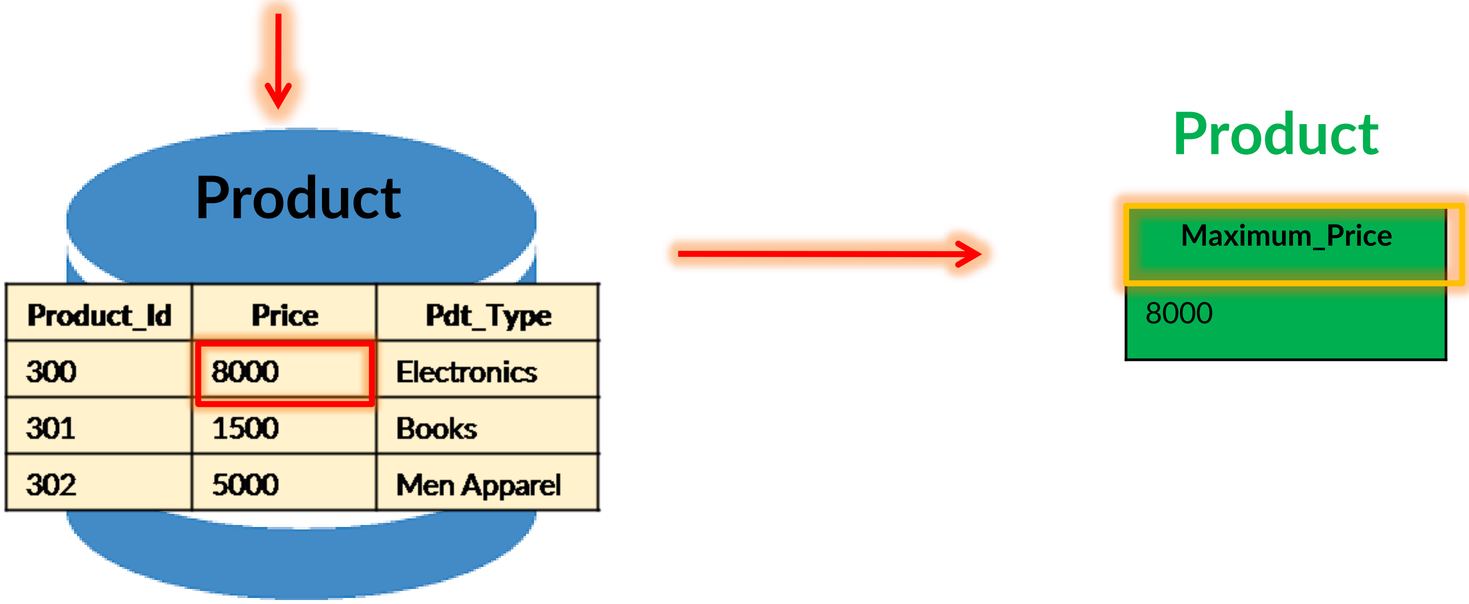
Minimum_Price
1500

Aggregate Function – Max()

- returns maximum value from a selected column of the table

Example

```
SELECT Max(Price) AS Maximum_Price
from Product
```



Product

Product_Id	Price	Pdt_Type
300	8000	Electronics
301	1500	Books
302	5000	Men Apparel

Product

Maximum_Price
8000

GROUP BY clause

- GROUP BY clause is used with SELECT statement to collect data from multiple records and group the results by one or more columns.

Syntax

```
SELECT expression1, expression2, ... expression_n,
aggregate_function (aggregate_expression)
FROM tables
WHERE conditions
GROUP BY expression1, expression2, ... expression_n;
```

GROUP BY clause

- expression1, expression2, ... expression_n: It specifies the expressions that are not encapsulated within aggregate function. These expressions must be included in GROUP BY clause.

- aggregate_function: It specifies the aggregate functions i.e. SUM, COUNT, MIN, MAX or AVG functions

- aggregate_expression: It specifies the column or expression on that the aggregate function is based on.

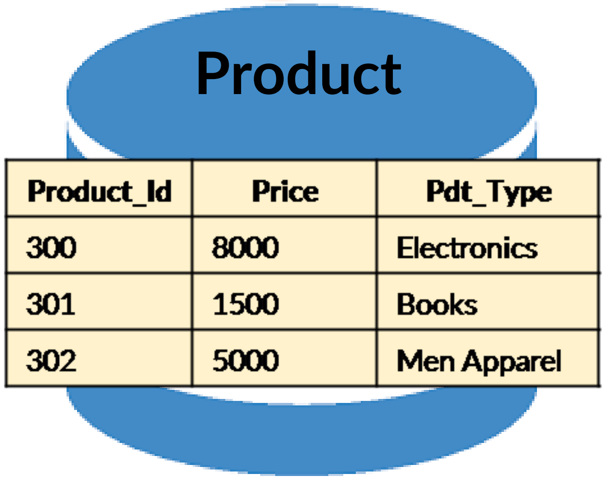
- tables: It specifies the table from where you want to retrieve records.

- conditions: It specifies the conditions that must be fulfilled for the record to be selected.

GROUP BY clause

Example 1

```
SELECT Pdt_Type, Max(Price) AS Maximum_Price
from Product GROUP BY Pdt_Type ORDER BY Pdt_Type;
```



Product_Id	Price	Pdt_Type
300	8000	Electronics
301	1500	Books
302	5000	Men Apparel

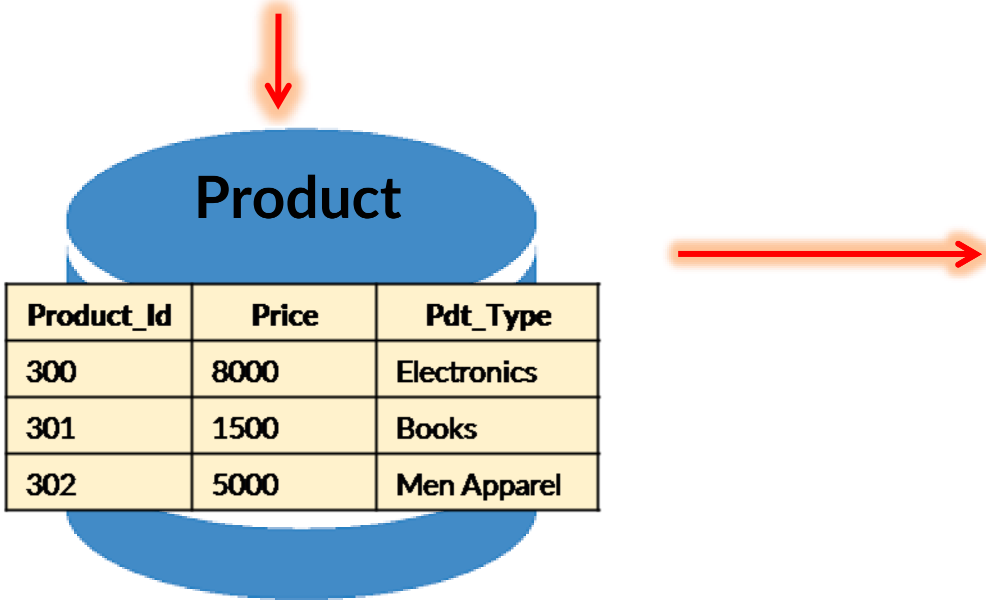
Product

Pdt_Type	Maximum_Price
Books	1500
Electronics	8000
Men Apparel	5000

GROUP BY clause

Example 1

SELECT Product_Id, Pdt_Type, Max(Price) AS Maximum_Price from Product GROUP BY Pdt_Type ORDER BY Pdt_Type;

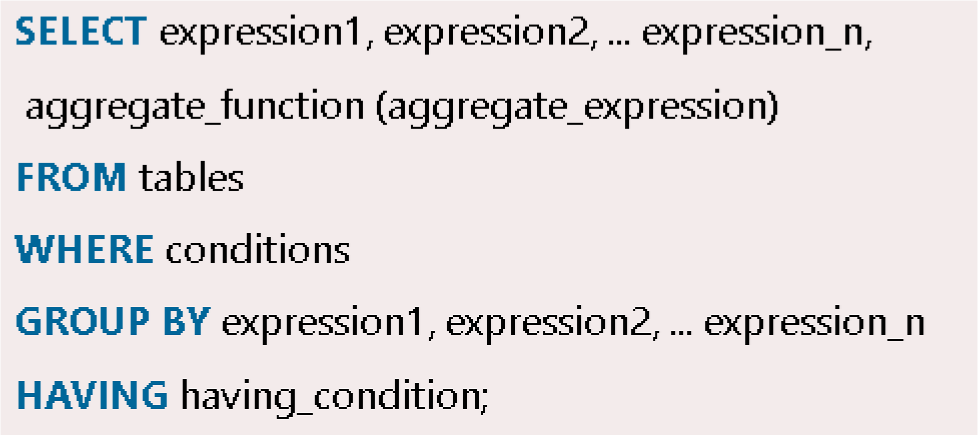


Product

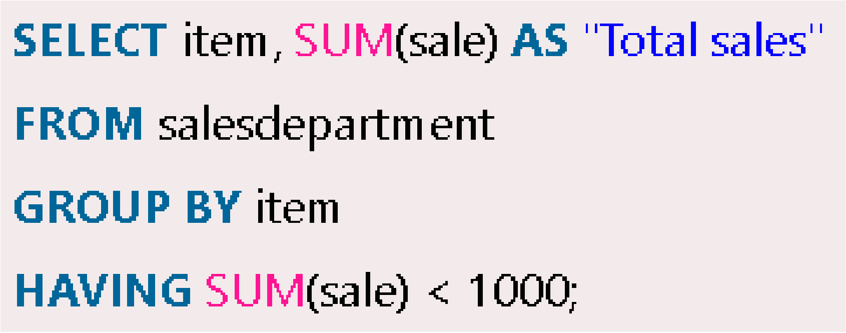
Product_Id	Price	Pdt_Type
300	8000	Electronics
301	1500	Books
302	5000	Men Apparel

Error.
Because the select Expression Product_Id is missing in GROUP BY

Ensure that all of the GROUP BY columns match the SELECT clause.



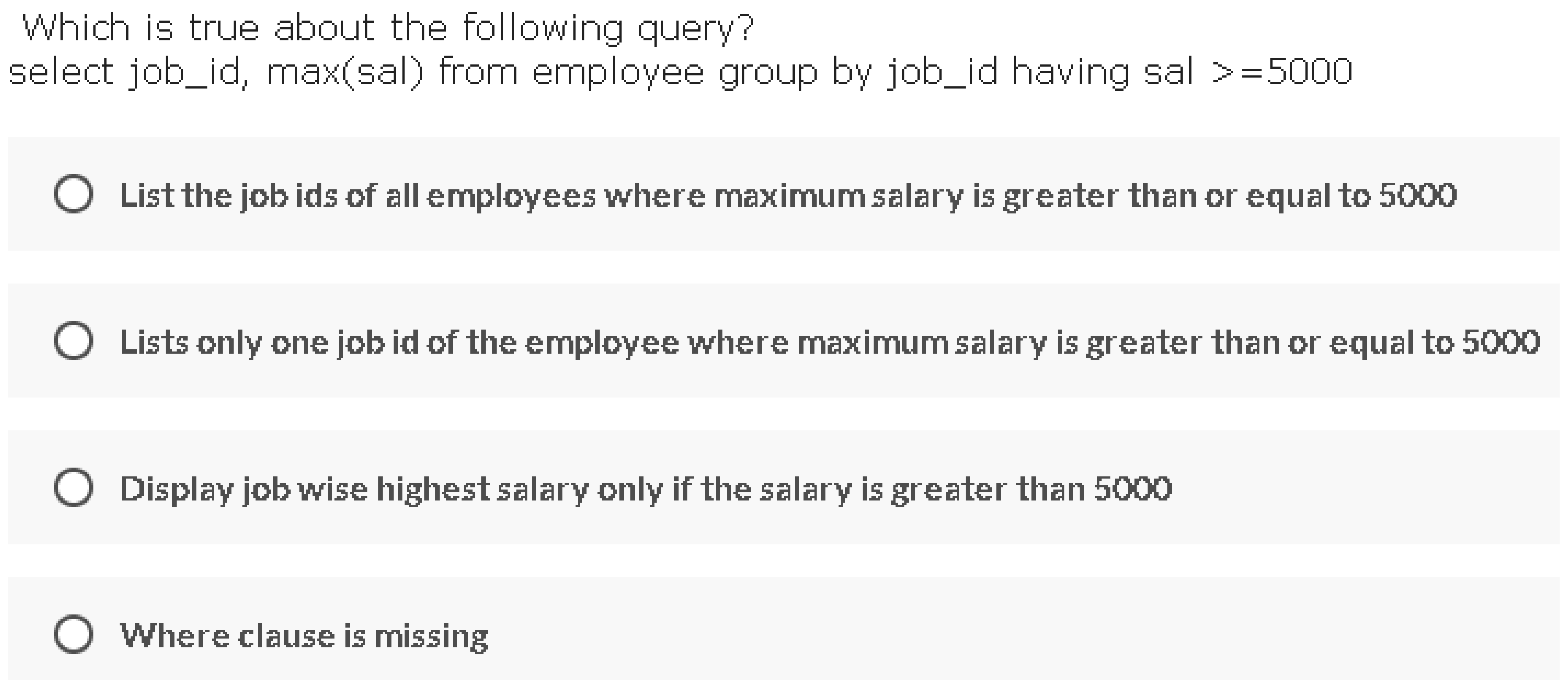
```sql
SELECT expression1, expression2, ... expression_n,
 aggregate_function (aggregate_expression)
FROM tables
WHERE conditions
GROUP BY expression1, expression2, ... expression_n
HAVING having_condition;
```



```sql
SELECT item, SUM(sale) AS "Total sales"
FROM salesdepartment
GROUP BY item
HAVING SUM(sale) < 1000;
```

having_conditions: It specifies the conditions that are applied only to the aggregated results to restrict the groups of returned rows.

The GROUP BY clause is used in the SELECT statement for grouping the rows by values of column or expression. For example, given groups of products in several categories, the AVG() function returns the average price of products in each category



Which is true about the following query?

```
select job_id, max(sal) from employee group by job_id having sal >=5000
```

○ List the job ids of all employees where maximum salary is greater than or equal to 5000

○ Lists only one job id of the employee where maximum salary is greater than or equal to 5000

○ Display job wise highest salary only if the salary is greater than 5000

○ Where clause is missing

THANKS

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