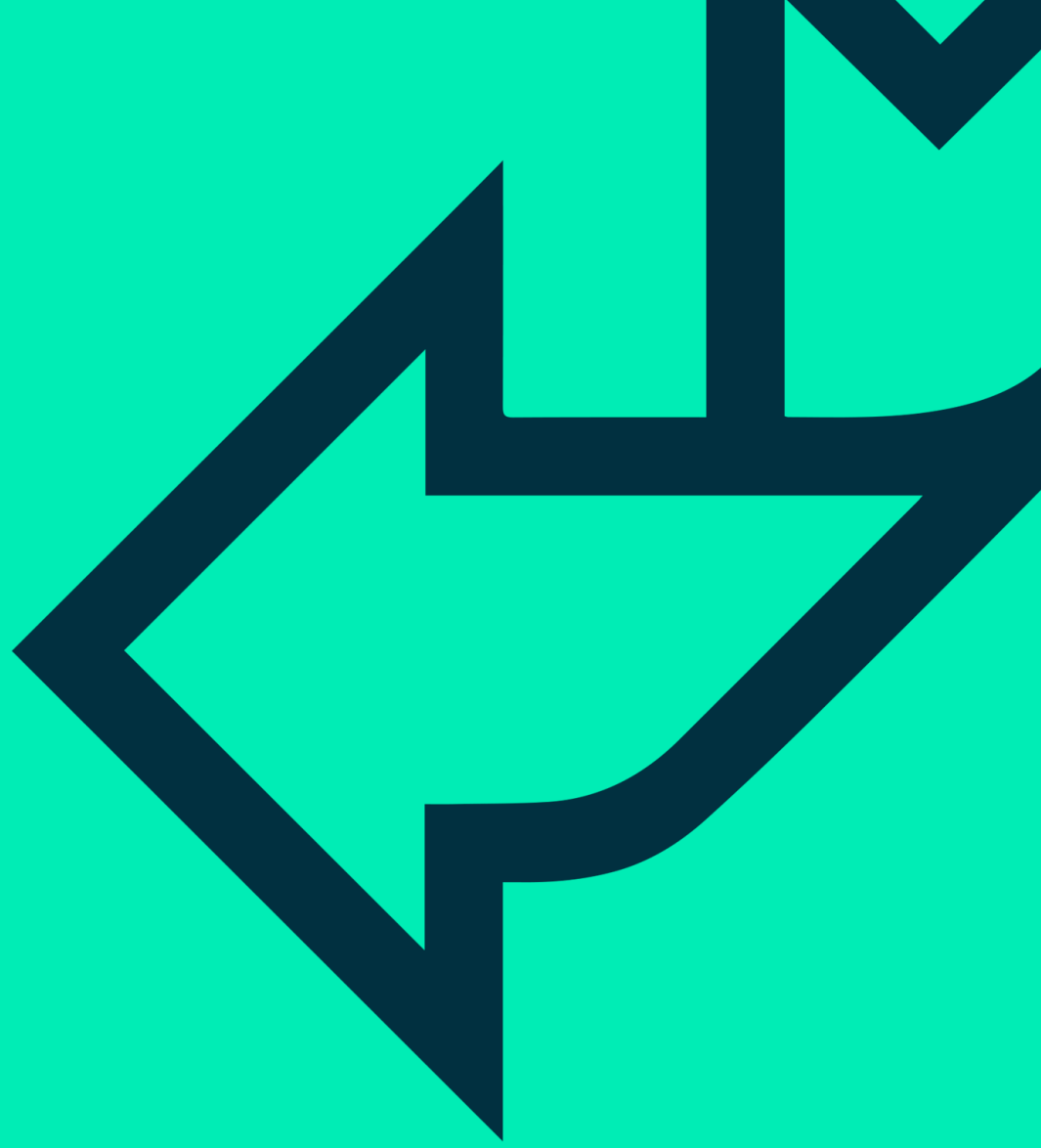
POWERING POTENTIAL

SQL:
Aggregation

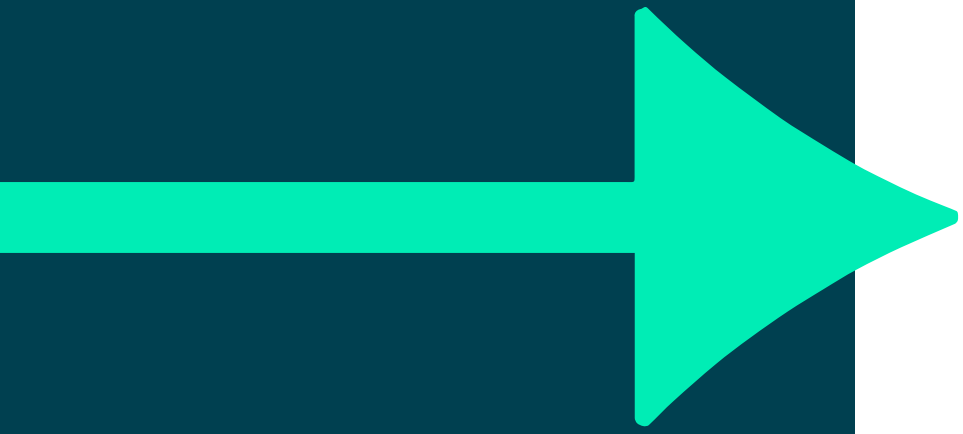
SQL

Lesson Objectives and Contents

- → Aggregation functions
- → Aggregation through Group By and Having



SELECT STATEMENT



SELECT <<field(s)>>
FROM <<table(s)>>
WHERE <<condition(s)>>
GROUP BY <<field(s)>>
HAVING <<condition(s)>>
ORDER BY <<field(s)>>

AGGREGATE FUNCTIONS

Aggregate functions operate across a set of rows in a column and output a single value.

Aggregate function can work in a SELECT list on it's own

```
SELECT  SUM (sales_target)
FROM    salesperson
```

If you want to see the breakdown of the summary with another field then must also use GROUP BY

```
SELECT   emp_no, SUM(order_value) AS 'Total'
FROM     sale
GROUP BY emp_no
```

AGGREGATE FUNCTIONS

COUNT(*)

COUNT(*<<expression>>***)**

SUM(*<<expression>>***)**

AVG(*<<expression>>***)**

MIN(*<<expression>>***)**

MAX(*<<expression>>***)**

NOTE:

COUNT(*) counts all rows, including those containing NULL.

All the other aggregate function ignore the NULL values.

It is not possible to calculate any of sum, average, min, max, etc. when one or more of the values are unknown.

GROUP BY

order_no	emp_no	order_value
1001	10	5
1002	20	10
1003	10	16
1004	20	23
1005	60	6

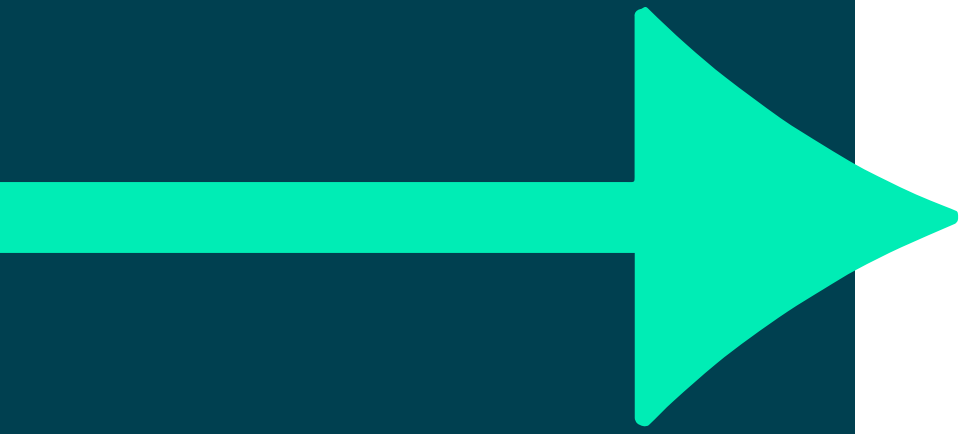
sale

```
SELECT    emp_no, SUM(order_value) 'Total'
FROM      sale
GROUP BY emp_no
```

Result

emp_no	Total
10	21
20	33
60	6

GROUP BY

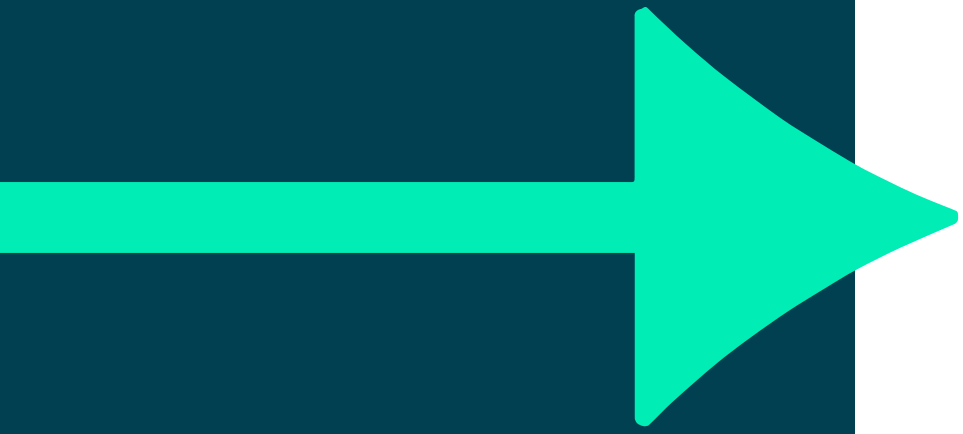


Try with the Northwind database

```
USE Northwind
SELECT CategoryID, AVG(UnitPrice) AS AvPrice
FROM Products
GROUP BY CategoryID
```

Each column in the SELECT list must be either an aggregate or in the GROUP BY clause.

THE HAVING CLAUSE



- The **HAVING** clause works with the result of the SQL query after the aggregate functions have been applied.
- Can be used to further filter results after the aggregate function has produced its results.
  - ❖ Can filter on the aggregate function itself.
  - ❖ Or on other column values in the SELECT list.
- Similar to WHERE clause in that it acts as a filter.
- Differs from WHERE clause in that it filters on results after the aggregates have been applied.
  - ❖ No aggregate function? No HAVING clause needed.
- It is possible to have both a WHERE clause and a HAVING clause.

GROUP BY HAVING

order_no	emp_no	order_value
1001	10	5
1002	20	10
1003	10	16
1004	20	23
1005	60	6

sale

Temporary internal table

emp_no	Total
10	21
20	33
60	6

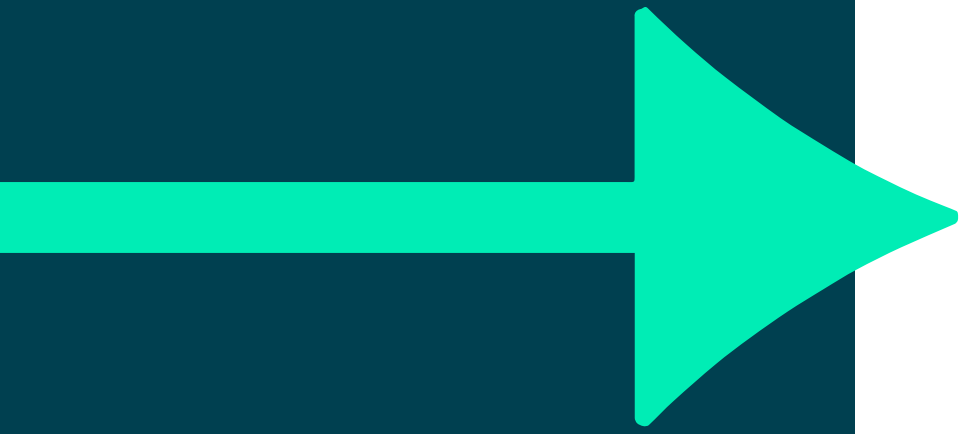
```
SELECT   emp_no,
         SUM(order_value) 'Total'
FROM     sale
GROUP BY emp_no
HAVING SUM(order_value) > 20
```

Can't use an aggregate in a Where clause

Result

emp_no	Total
10	21
20	33

GROUP BY HAVING



Try with the Northwind database

```
USE Northwind
SELECT CategoryID, AVG(UnitPrice) AS AvPrice
FROM Products
GROUP BY CategoryID
HAVING AVG(UnitPrice) > 30
ORDER BY AvPrice DESC
```

Each column in the SELECT list must be either an aggregate or in the GROUP BY clause.