

# **Introduction to SQL for Data Analysis (Student Version)**

BISA x Deloitte Workshop

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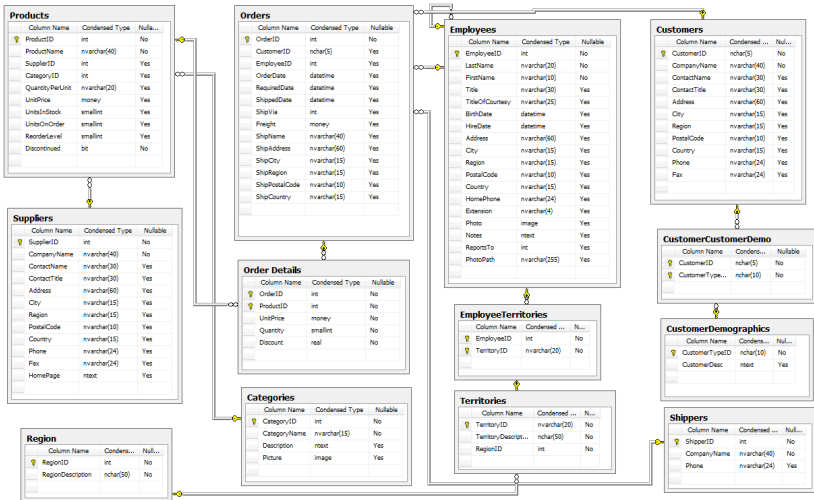
# Activities Outline

1. Activity 1 - SQL Fundamentals
2. Activity 2 - SQL Joins
3. Activity 3 - Exercises

## **Activity 1 - SQL Fundamentals**

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# Northwind ERD



## 1.1 SELECT Statement

```
SELECT *  
FROM Product
```

### Questions:

- What does the \* mean?
- What is “Product” in the 2nd line?
- After running the above code, how many products are there?

### Your Turn:

- Show only three columns from the Product table:  
ProductName, UnitPrice, Discontinued
- Bonus: After trying the above, can you try and add an  
ORDER BY clause (similar to the FROM clause), to sort the  
result by UnitPrice?

## 1.2 WHERE Clause (Basic Filtering)

```
SELECT ProductName, UnitPrice, Discontinued  
FROM Product  
WHERE Discontinued = 1
```

### Questions:

- What does the WHERE clause mean?
- What is the unit price for the product “Alice Mutton”?

### Your Turn:

- How to only show products with UnitsInStock less than 10?

## 1.3 BETWEEN Operator

```
SELECT Id, CustomerId, OrderDate, ShippedDate  
FROM 'Order'  
WHERE OrderDate BETWEEN '2012-12-25' AND '2012-12-31'
```

### Questions:

- Why did we put quotes on the word Order (2nd line)?
- How many orders were placed between 25th and 31st December in 2012?

### Your Turn:

- What are the total costs of Freight for orders shipped between 17th and 18th September in 2013? Hint: add up the three freight manually.

## 1.4 LIKE Operator

```
SELECT *  
FROM Customers  
WHERE CustomerName LIKE 'a%'
```

### Questions:

- What does this show?
- Why do we use wildcards and the LIKE operator?

### Your Turn:

- List all customers with a phone number that contains '555'  
e.g. (5) 555-4729



## 1.5 AVG ( ) and COUNT ( ) Functions

```
SELECT AVG(UnitPrice) AS AVG_Unit_Price  
FROM Product
```

### Question:

- What is the average unit price of products in the database?

### Your Turn:

- Using the count ( ) function, how many products are there which has a UnitPrice between \$15 and \$30? Hint: you will need to add another clause to specify the additional constraint.

## 1.6 GROUP BY Clause

```
SELECT CategoryId, AVG(UnitPrice) AS AVG_Unit_Price  
FROM Product  
GROUP BY CategoryId
```

### Questions:

- What is the average unit price for category 5?
- What do you notice when you added the Group By clause, compared to just the aggregation

### Your Turn:

- What is the maximum Freight Cost for each ShipRegion?  
Hint: use the 'Order' table

## **Activity 2 - SQL Joins**

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## 2.1 INNER and LEFT Join Clauses

```
SELECT Customer.Id, Customer.ContactName, 'Order'.Id  
FROM Customer  
INNER JOIN 'Order'  
ON Customer.Id = 'Order'.CustomerId
```

### Question:

- The Customer and Order tables have a 1:M relationship. The convention is FROM table 1 JOIN table 2. For an Inner Join, does the order of specifying tables matter?

### Your Turn:

- Change the join type to LEFT JOIN. Do you think you get more results returned compared to an INNER JOIN?

## 2.2 Cross Join Clause

The syntax to implement a cross join is:

```
SELECT * FROM table_name_1 CROSS JOIN table_name_2
```

### Questions:

- Before using a cross join, how many rows are there in the following tables: Region, Territory?
- Multiply the number of rows in those 2 tables - this is the expected number of rows in the result set in the following exercise.

### Your Turn:

- Show all the combinations of regions and territories using a cross join.

## **Activity 3 - Exercises**

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## Exercise 1

Run a query that retrieves a list of products that has less units in stock than units on order. List the product name, units on order, units in stock. Order by the product name.

Question: How many products are on the list?

## Exercise 2

Run a query that shows a list of orders shipped to Belgium (country), and the first and last name of employees who placed those orders.

Hint: you will need to use JOIN and WHERE clauses.

Question: How many orders that shipped to Belgium did Margaret Peacock place?



## Exercise 3

Below shows the first 5 rows of the OrderDetail table, which shows what products are inside each Order. The first 2 rows show that there are 2 products ordered in OrderId 10250. Similarly, there are 3 products in OrderId 10251.

i	Id	OrderId	ProductId	UnitPrice	Quantity	Discount
	10250/51	10250	51	42.4	35	0.15
	10250/65	10250	65	16.8	15	0.15
	10251/22	10251	22	16.8	6	0.05
	10251/57	10251	57	15.6	15	0.05
	10251/65	10251	65	16.8	20	0

Run a query that calculates the **revenue for each order**.

Hint: You only need to use the OrderDetail table. **Revenue for each product** is  $(\text{UnitPrice} - \text{Discount}) * \text{Quantity}$