



gdi

# INTRO TO SQL SESSION 1

APRIL 18, 2023 – MAY 4<sup>TH</sup> 2023

WEEK 1: APRIL 28 & APRIL 24<sup>TH</sup>

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# GDI'S INTRO TO SQL

- This class will focus on understanding how to use SQL and its basic syntax.
- Topics in this course will include: querying and aggregating data in individual tables, querying multiple related tables (JOINS), and writing subqueries.
- In this course, online SQL database tools will be used to teach students how to write queries. No installation is required.

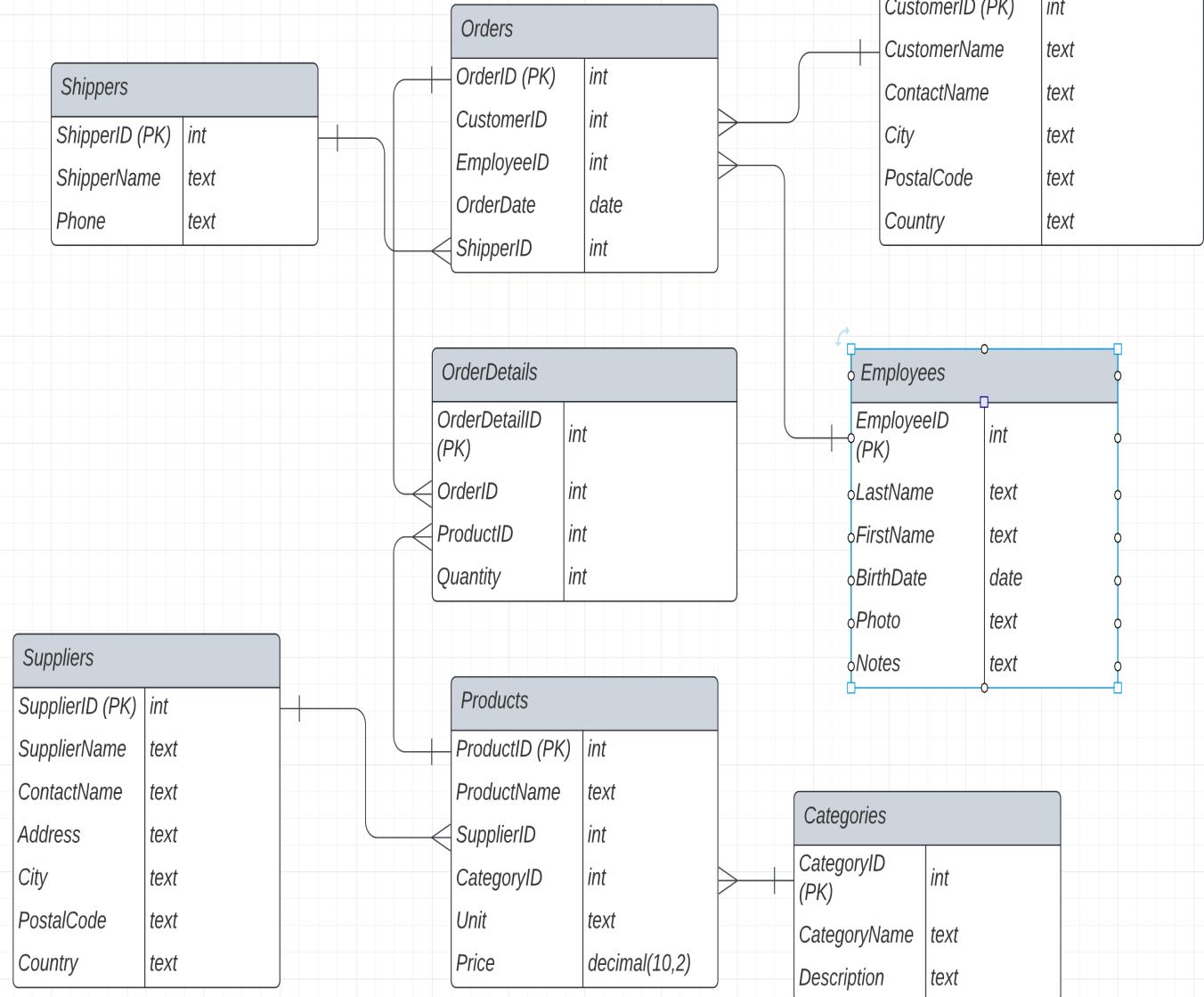
# ONLINE SQL TOOLS

- W3Schools has a SQL database to query -  
[https://www.w3schools.com/sql/trysql.asp?filename=trysql\\_editor](https://www.w3schools.com/sql/trysql.asp?filename=trysql_editor)
- DB Fiddle is a site used by companies to assess SQL skills, but it is also an easy way to learning to using SQL as well as create tables.  
<https://www.db-fiddle.com/f/6eXpPSRFQgzdKUCjSsbSF4/9>
- REPLIT.com is another way to learn SQL using SQLLite.  
I have created some examples for you to learn with.  
<https://replit.com/@sqlSylvia/GDI-SQLIntro>

# W3 SCHOOLS – DATA BASE

- In your browser open the following url to work with a SQL database in W3Schools.
- [https://www.w3schools.com/sql/trysql.asp?filename=trysql\\_editor](https://www.w3schools.com/sql/trysql.asp?filename=trysql_editor)

## W3Schools - Customer Orders



# SELECT \* FROM <TABLE>

- **SELECT statement is used to select data from a database.**
- **The FROM command is used to specify which table to select data from.**
- \* is used to return all columns of data in the table.
- The absence of a **WHERE** command means return all rows.

Your Database:

Tablename	Records
<a href="#">Customers</a>	91
<a href="#">Categories</a>	8
<a href="#">Employees</a>	10
<a href="#">OrderDetails</a>	518
<a href="#">Orders</a>	196
<a href="#">Products</a>	77
<a href="#">Shippers</a>	3
<a href="#">Suppliers</a>	29

SQL Statement: [Get your own SQL server](#)

```
SELECT * FROM Customers;
```

Edit the SQL Statement, and click "Run SQL" to see the result.

[Run SQL »](#)

Result:

Number of Records: 91

CustomerID	CustomerName	ContactName	Address	City	PostalCode	Country
1	Alfreds Futterkiste	Maria Anders	Obere Str. 57	Berlin	12209	Germany
2	Ana Trujillo Emparedados y helados	Ana Trujillo	Avda. de la Constitución 2222	México D.F.	05021	Mexico
3	Antonio Moreno Taquería del Maestro	Antonio Moreno	El Mburucuyá 7	Panamá	90110	Panama
4	Centro comercial Invertia	Francisco Perez	Avda. 5 de Mayo 2222	Montevideo	11000	Uruguay
5	Ernesto Cane Carnes y Frutas	Ernesto Cane	Avda. Constitución 2222	Montevideo	11000	Uruguay
6	Isabella Giga Gigantour	Isabella Giga	Avda. 5 de Mayo 2222	Montevideo	11000	Uruguay
7	Jalbert Comidas rápidas	Jalbert	Avda. 5 de Mayo 2222	Montevideo	11000	Uruguay
8	La Grande Epicerie de Paris	La Grande Epicerie de Paris	1 rue de la Paix	Paris	75002	France
9	Magazzini Alimentari Del Frantoio	Francesco Tunno	Via Monte Rosello 12	Cagliari	09101	Italy
10	Monica	Monica	23 Via Vespucci	Firenze	50137	Italy
11	Pastrana Gourmet Etcetera	Pastrana	Avda. 5 de Mayo 2222	Montevideo	11000	Uruguay
12	Reyes	Reyes	Avda. 5 de Mayo 2222	Montevideo	11000	Uruguay
13	Siempre Pescanova	Peregrina García	Avda. 5 de Mayo 2222	Montevideo	11000	Uruguay
14	Tiedemann Käse und Wurst Fabrik	Kurt Tiedemann	Obere Str. 57	Berlin	12209	Germany
15	Trädgårdsföreningen Blomsterbutiken Hilma	Hilma Karlsson	Årstaviken 2222	Stockholm	11000	Sweden
16	Uncle Bob's Spar & Borgr Galleri	Bob Jensen	Årstaviken 2222	Stockholm	11000	Sweden
17	Utzon Galleri	Utzon	Årstaviken 2222	Stockholm	11000	Sweden
18	Västberga Broms	Ulf Lindström	Årstaviken 2222	Stockholm	11000	Sweden
19	Wistow Furniture Emporium	Howard Wistow	Obere Str. 57	Berlin	12209	Germany
20	Zeynep Dede Galeri	Zeynep Dede	Årstaviken 2222	Stockholm	11000	Sweden
21	Zöllner Galleri	Albert Zöllner	Årstaviken 2222	Stockholm	11000	Sweden
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# SELECT DISTINCT AND ORDER BY

- The DISTINCT clause returns only UNIQUE records (removes duplicate records).
- ORDER BY sorts the results in alphabetical or numeric order depending on table fields/columns in the SELECT statement
- Try the following
  - SELECT DISTINCT City, Country  
FROM [Customers]  
ORDER BY COUNTRY

SQL Statement:

```
SELECT DISTINCT City, Country FROM [Customers] ORDER BY Country
```

Edit the SQL Statement, and click "Run SQL" to see the result.

[Run SQL »](#)

Result:

Number of Records: 69

City	Country
Buenos Aires	Argentina
Graz	Austria
Salzburg	Austria
Bruxelles	Belgium
Charleroi	Belgium
São Paulo	Brazil
Campinas	Brazil
Rio de Janeiro	Brazil
Resende	Brazil
Tsawassen	Canada

# SQL AGGREGATE FUNCTIONS

- TRY the following in Customer Orders Database
- `SELECT MAX(OrderDate) , COUNT(*) FROM [Orders]`
- `SELECT MIN(Price), MAX(Price) , AVG(PRICE) FROM [Products]`
- `SELECT DISTINCT Country FROM [Customers]`

SQL function	returns
AVG()	the mean average of the elements in the column
COUNT()	the total number of elements in the column
DISTINCT()	the number of distinct values across the column
MAX()	the largest-value element in the column
MIN()	the smallest-value element in the column
SUM()	the arithmetic total of all values in the column

# USING THE WHERE CLAUSE

The WHERE clause is used to returns the rows meeting the criteria

Try the following and let's discuss your results

- SELECT \* from Suppliers WHERE Country = "USA"
- SELECT \* FROM [Customers] where City = "London"
- SELECT \* FROM [Products] Where Price >= 18
- SELECT \* FROM [OrderDetails] where Quantity < 5



# SQL OPERATORS: AND, OR, NOT

SQL Operators are used within the WHERE Statement and CASE Statement.

Let's focus on WHERE Statement

```
SELECT * FROM Customers  
WHERE Country = "Argentina" OR  
Country = "Venezuela"
```

```
SELECT * FROM Customers  
WHERE Country = "Venezuela" AND  
PostalCode = 5022
```

# LIKE CLAUSE

- The LIKE operator is used in a WHERE clause to search for a specified pattern in a column.
- There are two wildcards often used in conjunction with the LIKE operator:
  - The percent sign (%) represents zero, one, or multiple characters
  - The underscore sign (\_) represents one, single character

# JOIN – JOINING TABLES

- A JOIN combines columns from one or more tables to a new table.
  - INNER JOIN – returns each row in the two joined tables that have matching column values
  - LEFT OUTER JOIN - The result of a **left outer join** (or simply **left join**) for tables A and B always contains all rows of the "left" table (A), even if the join-condition does not find any matching row in the "right" table (B).
  - RIGHT OUTER JOIN - A **right outer join** (or **right join**) closely resembles a left outer join, except with the treatment of the tables reversed.
  - FULL OUTER JOIN - combines the effect of applying both left and right outer joins. Where rows in the FULL OUTER JOINed tables do not match, the result set will have NULL values for every column of the table that lacks a matching row. For those rows that do match, a single row will be produced in the result set (containing columns populated from both tables).
  - CROSS JOIN – returns the Cartesian product of rows from tables in the join.  
In other words, it will produce rows that combine each row from the first table with each row from the second table.

# INNER JOIN EXAMPLE

- ```
SELECT ORDERID ,  
       SUM(OrderDetails.Quantity *  
            Products.Price )  
  
      FROM [OrderDetails]  
      JOIN [Products]  
      ON OrderDetails.ProductID =  
          Products.ProductID  
      GROUP BY ORDERID
```

SQL Statement:

```
SELECT ORDERID, SUM(OrderDetails.Quantity * Products.Price)  
FROM [OrderDetails]  
JOIN [Products]  
    ON OrderDetails.ProductID = Products.ProductID  
GROUP BY ORDERID
```

Edit the SQL Statement, and click "Run SQL" to see the result.

[Run SQL »](#)

Result:

Number of Records: 196

| OrderID | SUM(OrderDetails.Quantity * Products.Price) |
|---------|---------------------------------------------|
| 10248   | 566                                         |
| 10249   | 2329.25                                     |
| 10250   | 2267.25                                     |
| 10251   | 839.5                                       |
| 10252   | 4662.5                                      |
| 10253   | 1806                                        |
| 10254   | 781.5                                       |
| 10255   | 3115.75                                     |
| 10256   | 648                                         |
| 10257   | 1400.5                                      |

# JOINS: OUTER LEFT/RIGHT

```
SELECT Customers.CustomerName, count(Orders.OrderID)  
FROM [Customers]  
LEFT JOIN [Orders] ON Orders.CustomerID = Customers.CustomerID  
GROUP BY Customers.CustomerName
```

ACTION: Re-write this statement using RIGHT JOIN

# WEEK 1: PRACTICE ASSIGNMENT

- Using the W3Schools Database answer the following questions:

1. Which customer has the most number of Orders?
2. Which customer has spent the most money in Orders?
3. Are there any employees that went to Boston College? Who?
4. How many products are there by category? List out CategoryName, and number of products?
5. How many orders used “Speedy Express” Shipper?

What other insights can you provide?

# LEARNING AND PRACTICING: SQL RESOURCES

- Online Databases for learning
  - [https://www.w3schools.com/sql/trysql.asp?filename=trysql\\_editor](https://www.w3schools.com/sql/trysql.asp?filename=trysql_editor)
  - The following 2 databases are the same schema, but in.
    - <https://www.db-fiddle.com/f/6eXpPSRFQgzdKUCjSsbSF4/9> – No login required but you need to save your work elsewhere for backup.
    - <https://replit.com/@sqlSylvia/GDI-SQLIntro>. - replit you need an account to save your work
- SQL Reference information
  - <https://www.w3schools.com/sql/default.asp>
  - <https://www.tutorialspoint.com/sql/index.htm>