Conditional Expressions and Operators

SQL

- Section Overview
  - CASE
  - COALESCE
  - NULLIF
  - CAST
  - Views
  - Import and Export Functionality

SQL

- These keywords and functions will allow us to add logic to our commands and workflows in SQL.
- Let’s get started!

CASE

SQL

- We can use the **CASE** statement to only execute SQL code when certain conditions are met.
- This is very similar to **IF/ELSE** statements in other programming languages.

SQL

- There are two main ways to use a CASE statement, either a general CASE or a CASE expression.
- Both methods can lead to the same results.
- Let’s first show the syntax for a “general” CASE.

SQL

- General Syntax
  - CASE

```
        WHEN condition1 THEN result1
    WHEN condition2 THEN result2
    ELSE some_other_result
END
```

PIERIAN DATA

SQL

- Simple Example
  - SELECT * FROM test;

a
1
2

PIERIAN DATA

SQL

- Simple Example
  - SELECT a,

a
1
2

SQL

- Simple Example
  - SELECT a,
    CASE

a
1
2

PIERIAN DATA

SQL

- Simple Example
  - SELECT a,
    CASE WHEN a =1 THEN ‘one’

a
1
2

SQL

- Simple Example
  - SELECT a,
    CASE WHEN a = 1 THEN ‘one’
    WHEN a = 2 THEN ‘two’

a
1
2

PIERIAN DATA

SQL

- Simple Example
  - SELECT a,
    CASE WHEN a = 1 THEN ‘one’
    WHEN a = 2 THEN ‘two’
    ELSE ‘other’

a
1
2

PIERIAN DATA

SQL

- Simple Example
  - SELECT a,
    CASE WHEN a = 1 THEN ‘one’
    WHEN a = 2 THEN ‘two’
    ELSE ‘other’
    END
    FROM test;

a	Case
1	one
2	two

SQL

- Simple Example
  - SELECT a,
    CASE WHEN a = 1 THEN ‘one’
    WHEN a = 2 THEN ‘two’
    ELSE ‘other’ AS label
    END
    FROM test;

a	label
1	one
2	two

SQL

- The CASE expression syntax first evaluates an expression then compares the result with each value in the WHEN clauses sequentially.

SQL

- *CASE Expression Syntax*
  - CASE expression

        WHEN value1 THEN result1

    WHEN value2 THEN result2

    ELSE some_other_result

END

PIERIAN DATA

SQL

- Rewriting our previous example:
  - SELECT a,
    CASE a WHEN 1 THEN 'one'
    WHEN 2 THEN 'two'
    ELSE 'other'
    END
    FROM test;

a	label
1	one
2	two

SQL

- Let’s work through some examples in pgAdmin!

CASE

Challenge Task

PIERIAN DATA

SQL

- We want to know and compare the various amounts of films we have per movie rating.
- Use CASE and the dvdrental database to re-create this table:

r bigint	pg bigint	pg13 bigint
195	194	223

PIERIAN DATA

SQL

- Hints
  - Review our CASE expression example that used SUM in the previous lecture

SQL

- Let’s jump to pgAdmin to walk through the solution!

COALESCE

SQL

- The COALESCE function accepts an unlimited number of arguments. It returns the first argument that is not null. If all arguments are null, the COALESCE function will return null.
  - COALESCE (arg_1,arg_2,...,arg_n)

SQL

- Example
  - SELECT COALESCE (1, 2)
    - 1
  - SELECT COALESCE(NULL, 2, 3)
    - 2

SQL

- The COALESCE function becomes useful when querying a table that contains null values and substituting it with another value. Let’s see a simple example

SQL

- Table of Products
  - Price and Discount in Dollars

Item	Price	Discount
A	100	20
B	300	null
C	200	10

SQL

- Table of Products
  - What is the final price?

Item	Price	Discount
A	100	20
B	300	null
C	200	10

SQL

- SELECT item,(price - discount) AS final FROM table

Item	final
A	80
B	null
C	190

SQL

- SELECT item,(price - discount) AS final FROM table
- Doesn’t work for item B, should be 300.

Item	final
A	80
B	null
C	190

SQL

```
SELECT item,(price - COALESCE(discount,0))
AS final FROM table
```

Item	final
A	80
B	300
C	190

PIERIAN DATA

SQL

- Keep the COALESCE function in mind in case you encounter a table with null values that you want to perform operations on!

CAST

SQL

- The CAST operator let’s you convert from one data type into another.
- Keep in mind not every instance of a data type can be CAST to another data type, it must be reasonable to convert the data, for example ‘5’ to an integer will work, ‘five’ to an integer will not.

SQL

- Syntax for CAST function
  - SELECT CAST('5' AS INTEGER)

- PostgreSQL CAST operator
  - SELECT '5'::INTEGER

SQL

- Keep in mind you can then use this in a SELECT query with a column name instead of a single instance.
  - **SELECT CAST(date AS TIMESTAMP) FROM table**

SQL

- Let’s explore some examples in pgAdmin!

NULLIF

SQL

- The NULLIF function takes in 2 inputs and returns NULL if both are equal, otherwise it returns the first argument passed.
  - NULLIF(arg1,arg2)
- Example
  - NULLIF(10,10)
    - Returns NULL

SQL

- The NULLIF function takes in 2 inputs and returns NULL if both are equal, otherwise it returns the first argument passed.
  - NULLIF(arg1,arg2)
- Example
  - NULLIF(10,12)
    - Returns 10

SQL

- This becomes very useful in cases where a NULL value would cause an error or unwanted result.
- Let’s see an example.

SQL

- Given this table calculate the ratio of Department A to Department B

Name	Department
Lauren	A
Vinton	A
Claire	B

SQL

- We can see easily the ratio of A to B is 2:1 or 200%
- Let's use SQL to solve for this with CASE

Name	Department
Lauren	A
Vinton	A
Claire	B

SQL

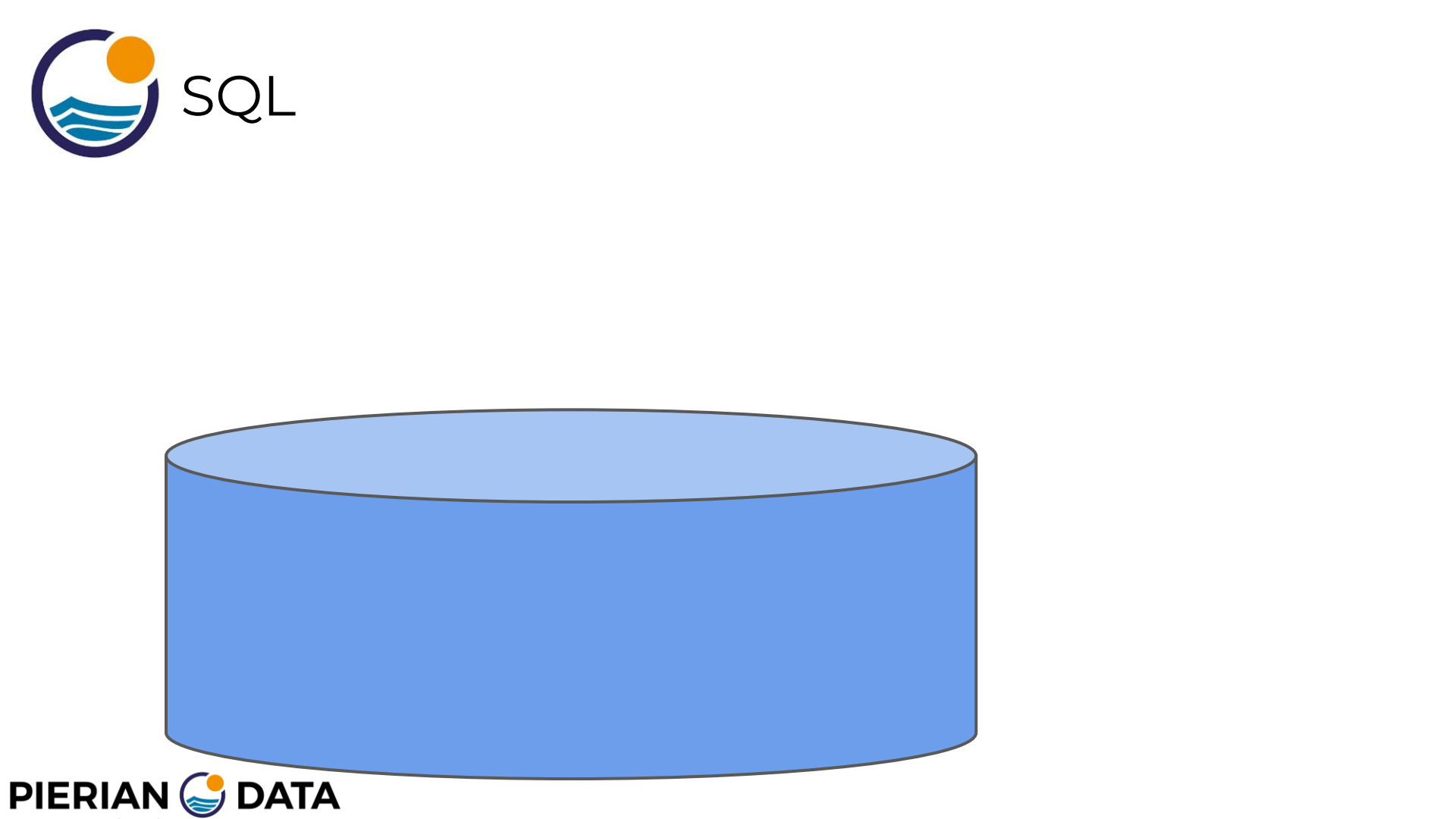
- Let’s jump to pgAdmin, quickly create this table and walk through solving the RATIO and why we may need NULLIF

Name	Department
Lauren	A
Vinton	A
Claire	B

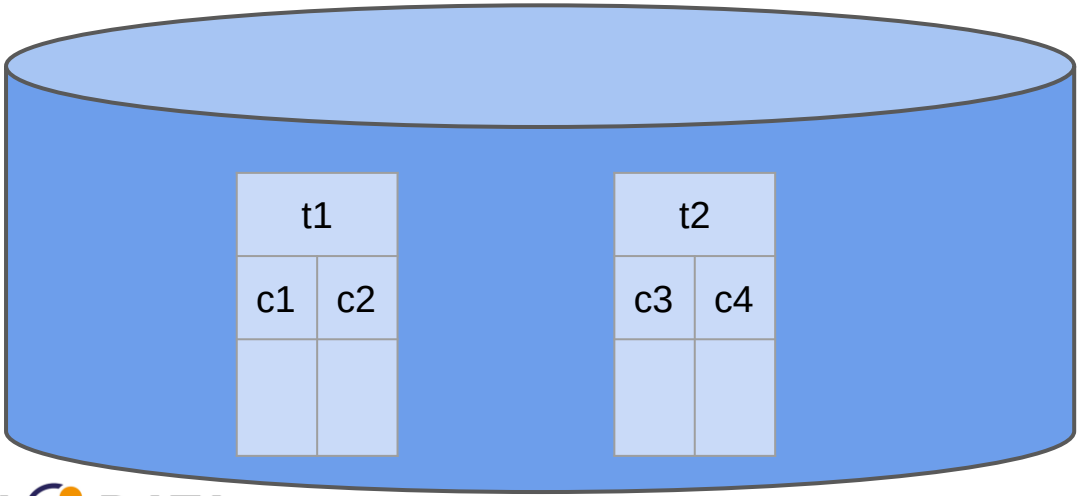
VIEWS

SQL

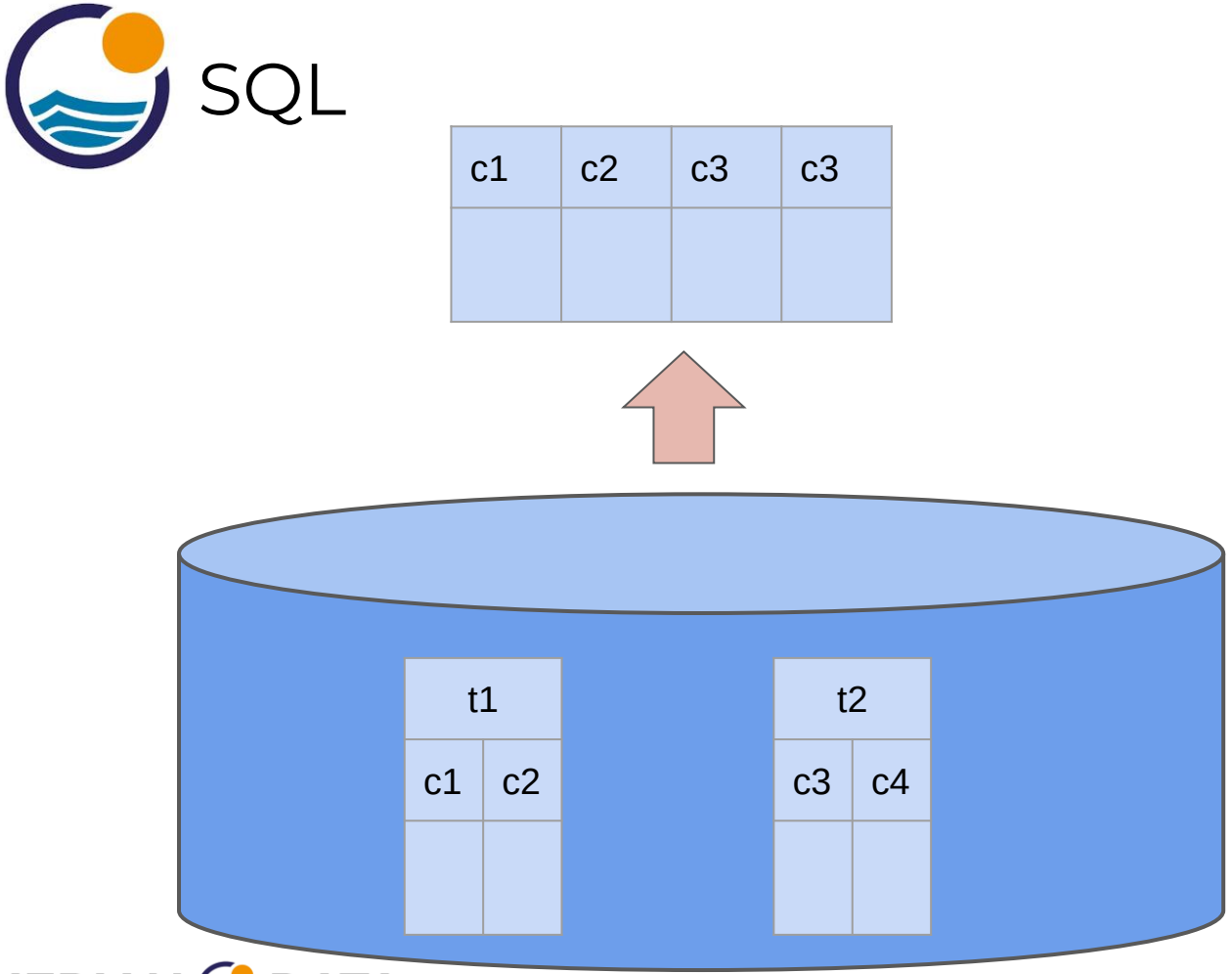
- Often there are specific combinations of tables and conditions that you find yourself using quite often for a project.
- Instead of having to perform the same query over and over again as a starting point, you can create a VIEW to quickly see this query with a simple call.

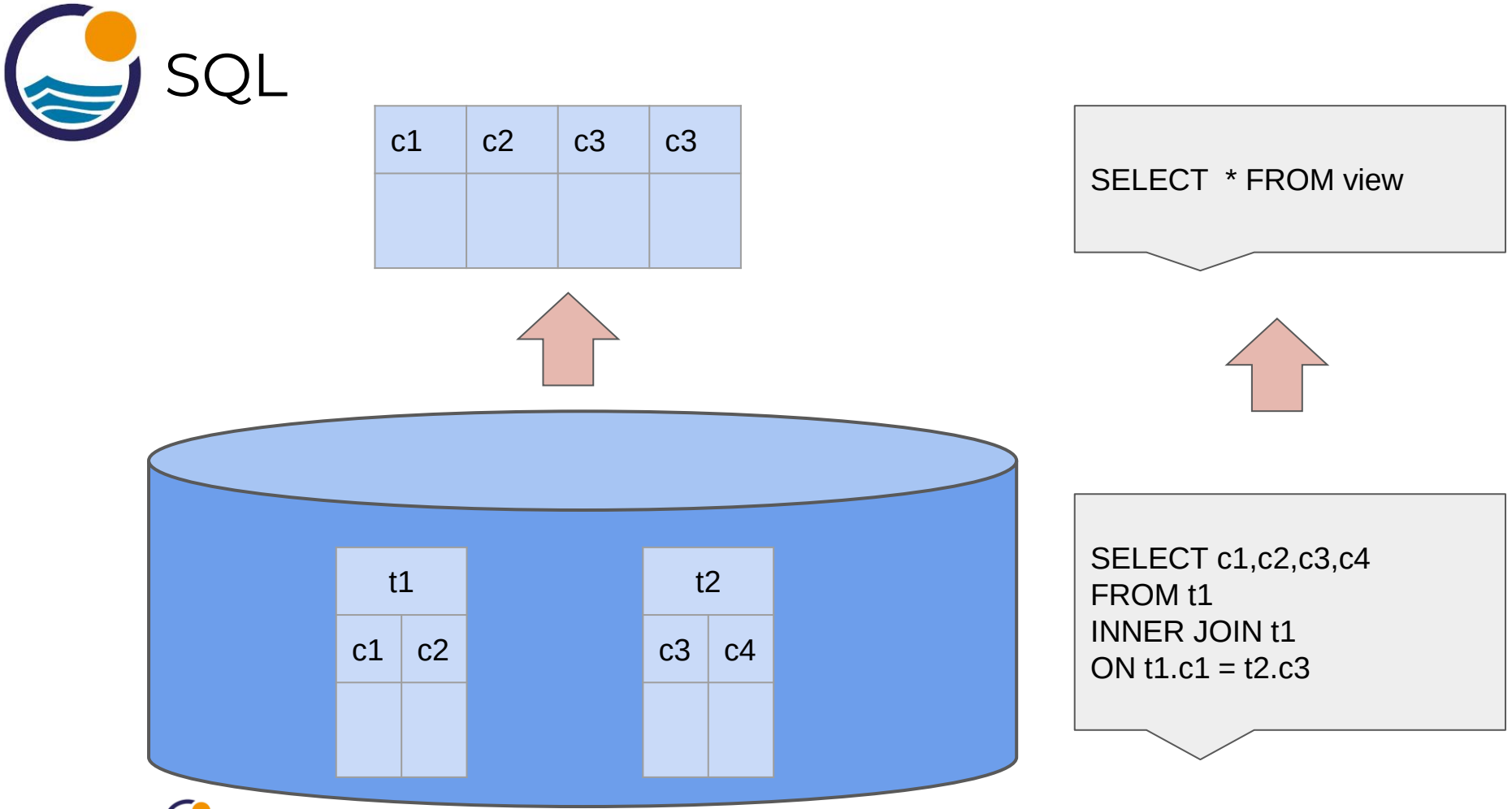

SQL
PIERIAN DATA

SQL



PIERIAN DATA


SQL
c1
c2
c3
c3
t1
c1
c2
t2
c3
c4
SELECT c1,c2,c3,c4
FROM t1
INNER JOIN t1
ON t1.c1 = t2.c3
PIERIAN DATA


SQL
c1
c2
c3
c3
SELECT * FROM view
t1
c1
c2
t2
c3
c4
SELECT c1,c2,c3,c4
FROM t1
INNER JOIN t1
ON t1.c1 = t2.c3
PIERIAN DATA

SQL

- A view is a database object that is of a stored query.
- A view can be accessed as a virtual table in PostgreSQL.
- Notice that a view does not store data physically, it simply stores the query.

SQL

- You can also update and alter existing views.
- Let’s explore this in pgAdmin!

Importing and Exporting Data

SQL

- In this lecture we will explore the Import/Export functionality of PgAdmin, which allows us to import data from a .csv file to an already existing table.
- There are some important notes to keep in mind when using Import/Export

SQL

- Important Note!
  - Not every outside data file will work, variations in formatting, macros, data types, etc. may prevent the Import command from reading the file, at which point, you must edit your file to be compatible with SQL.

SQL

- Details of compatible file types and examples are available in the online documentation:
- **postgresql.org/docs/12/sql-copy.html**

SQL

- Important Note!
  - You **MUST** provide the 100% correct file path to your outside file, otherwise the Import command will fail to find the file.
  - The most common mistake if failing to provide the correct file path, confirm the file's location under its properties.

SQL

- **VERY** Important Note!
  - The Import command **DOES NOT** create a table for you.
  - It assumes a table is already created.
  - Currently there is no automated way within pgAdmin to create a table directly from a .csv file.

SQL

- Let’s work through an example in pgAdmin!