TABLEAU DATA MODEL

In versions of Tableau **prior** to **2020.2**, the **data model** had **only** the **physical layer**.
In Tableau **2020.2 and later**, the **data model** has the **logical (semantic) layer** and a **physical layer**.

This provides more options for combining data using schemas based on which might be more suitable for analysis.

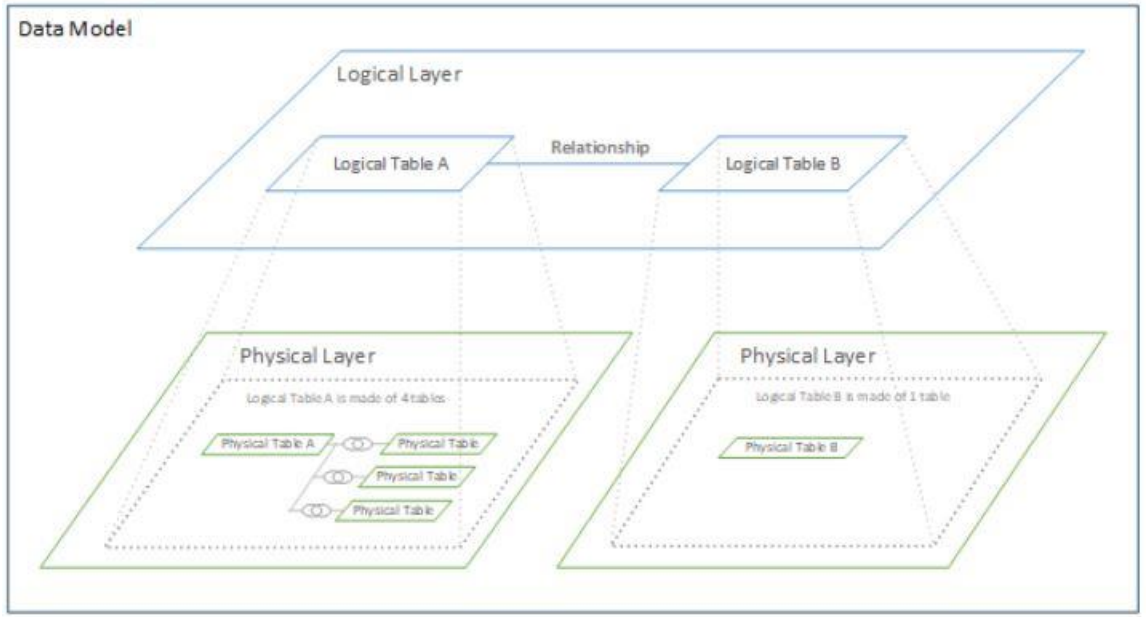


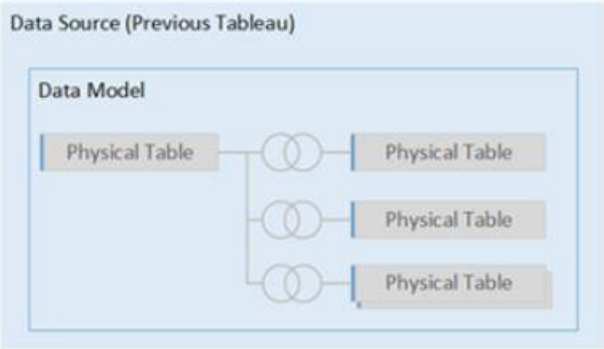
TABLEAU DATA MODEL

In previous versions of Tableau, the **data model** in the data source consisted of a single, **physical layer** where we could specify **joins and unions**.
Tables added to the physical layer (joined or unioned) create a single, flattened table (denormalized) for analysis.

For Tableau **versions 2020.2 and beyond**, the **data model** in the data source includes a new semantic layer above the physical layer—called the **logical layer**
At this logical layer we can add multiple tables and relate them to each other.
Tables at the logical layer are not merged in the data source, they remain distinct (normalized), and maintain their native level of detail.
Logical tables act like containers for merged physical tables.
A logical table can contain a single, physical table or it can contain multiple physical tables merged through joins or unions.

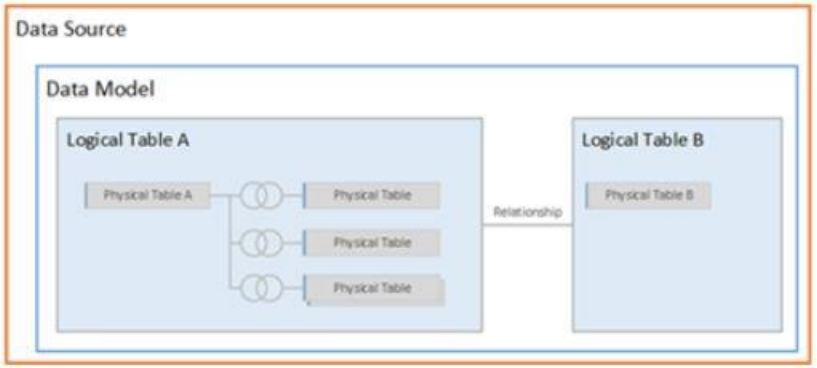
TABLEAU DATA MODEL

PREVIOUS VERSIONS



In versions of Tableau before 2020.2, the data model has only the physical layer

2020.2 AND LATER



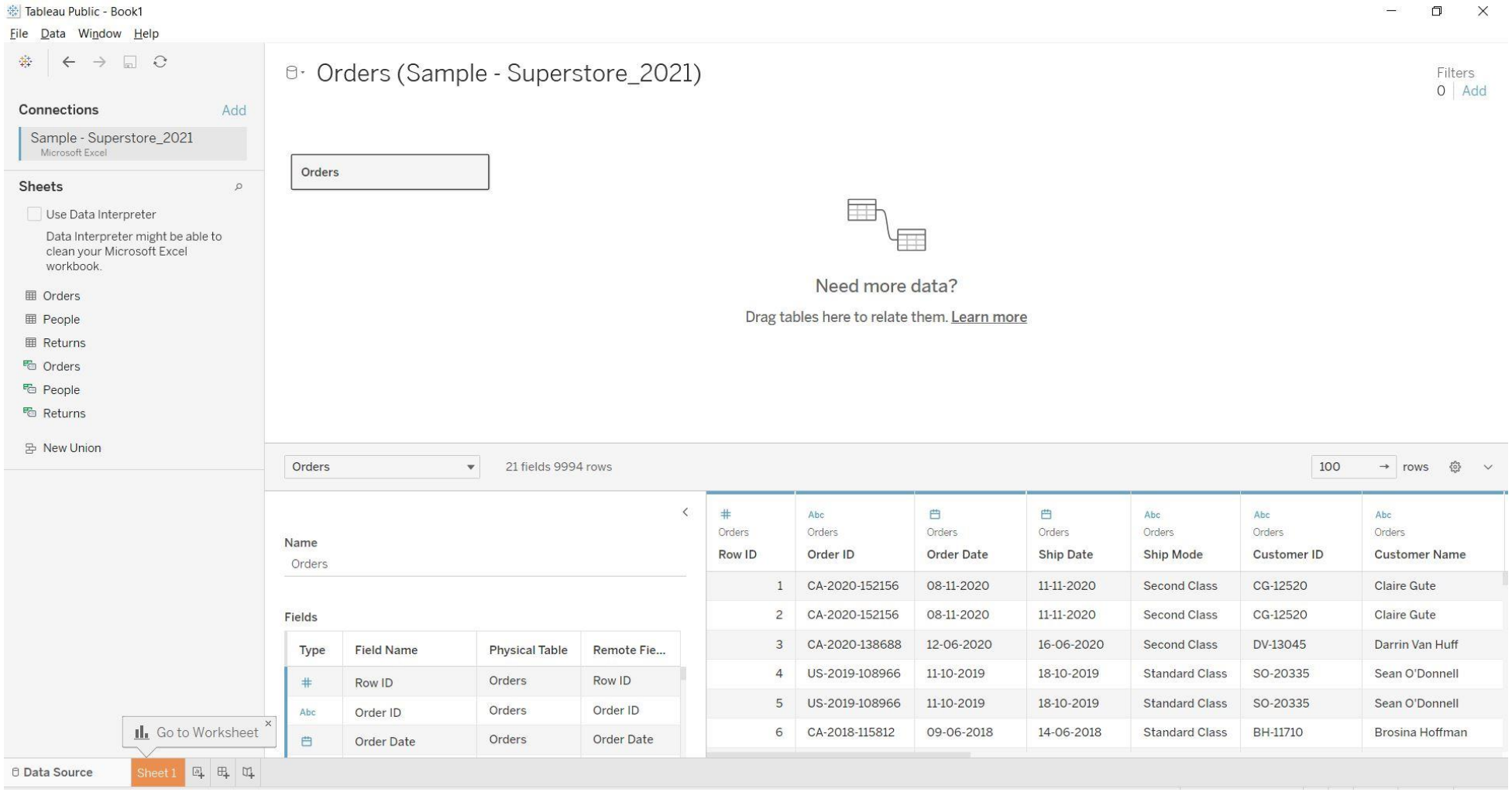
In 2020.2 and later, the data model has two layers: the logical layer and the physical layer

STEPS TO CREATE A RELATIONSHIP AND A JOIN

Step 1: Relationships can be created in the **logical layer** of the data source.

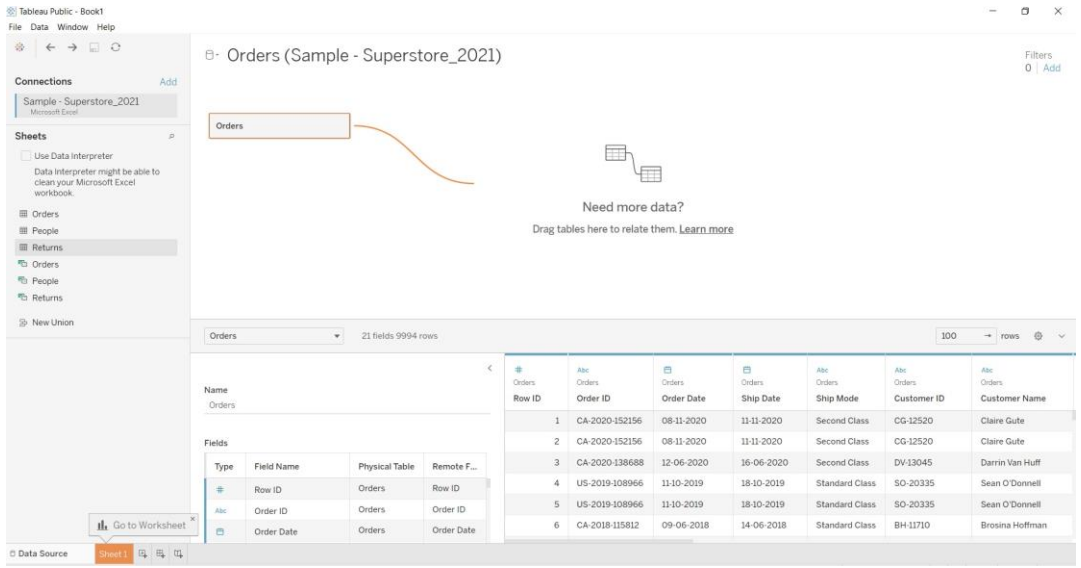
This is the default view of the canvas that we see in the Data Source page.

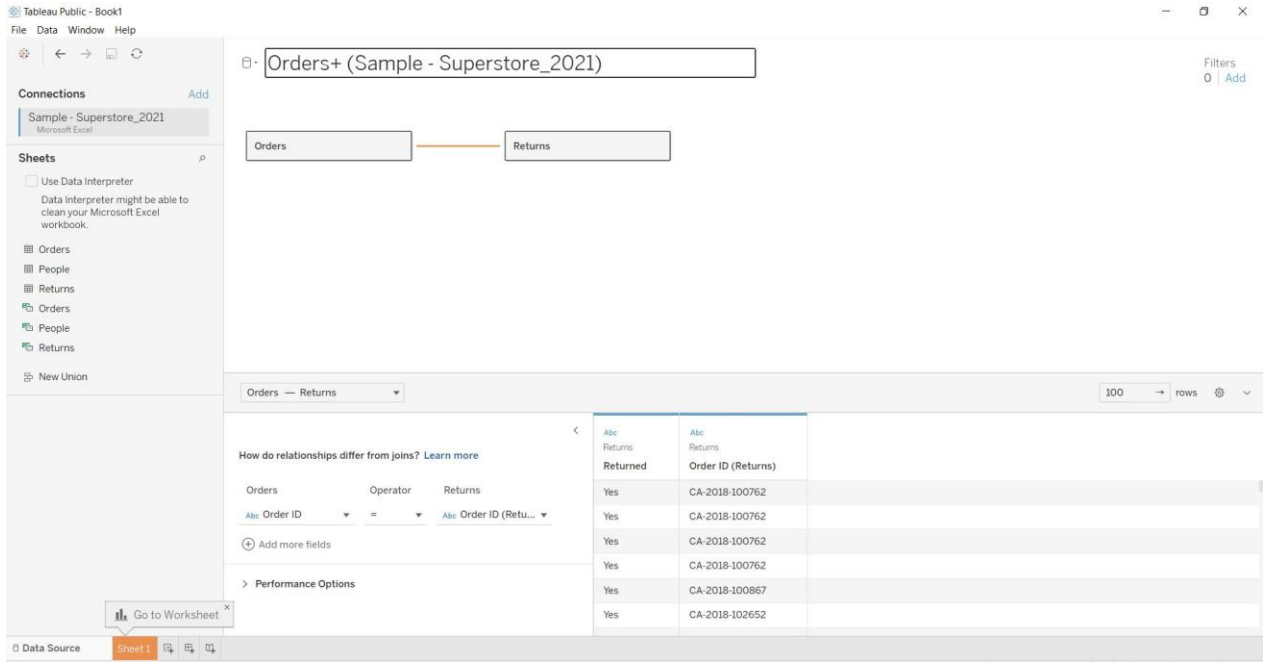
Drag the **Orders table** to the canvas



STEPS TO CREATE A RELATIONSHIP AND A JOIN

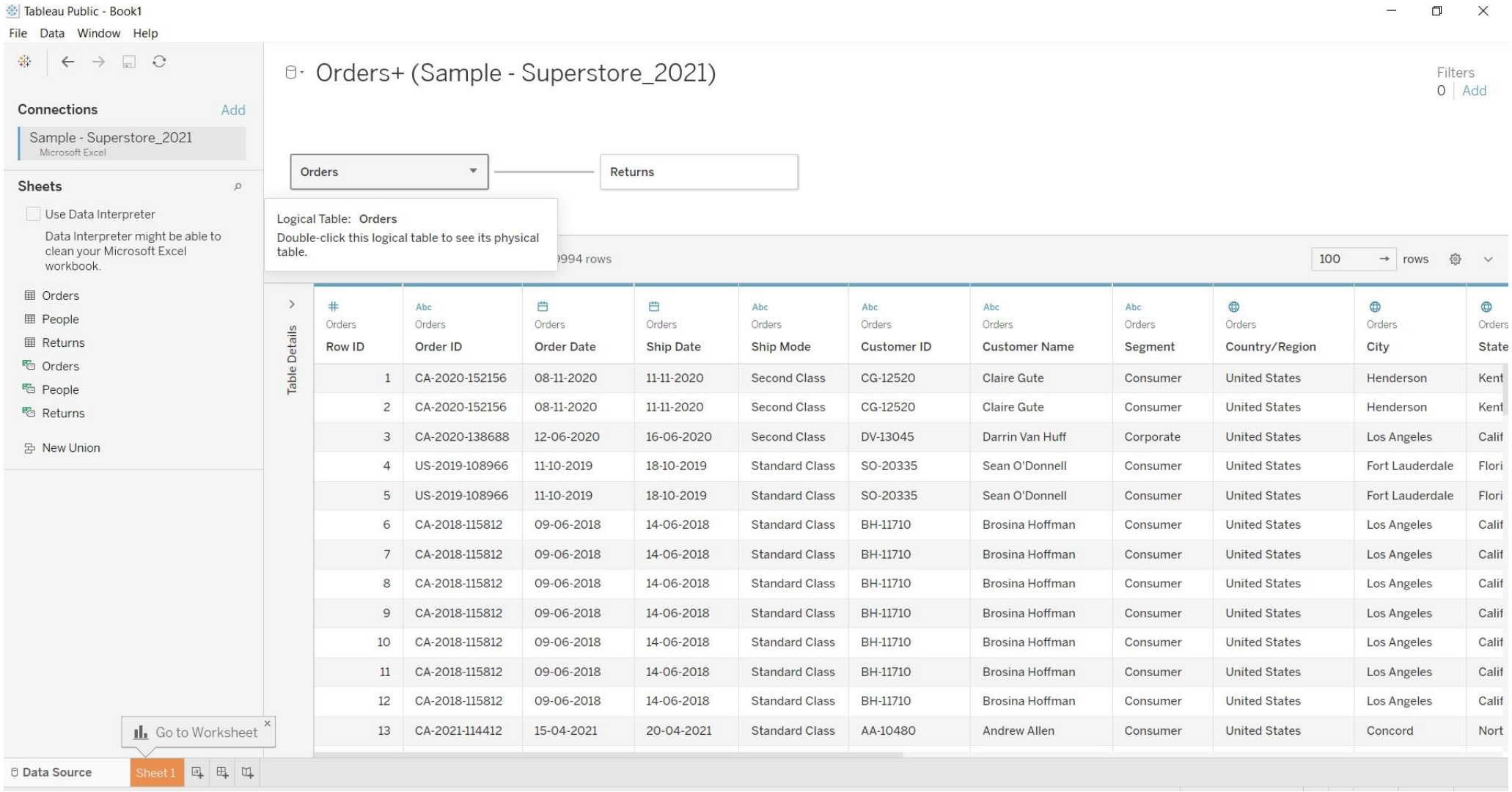
Step 2: Drag the second table **Returns table** to the canvas.
When we see the "**noodle**" between the two tables, drop that table.





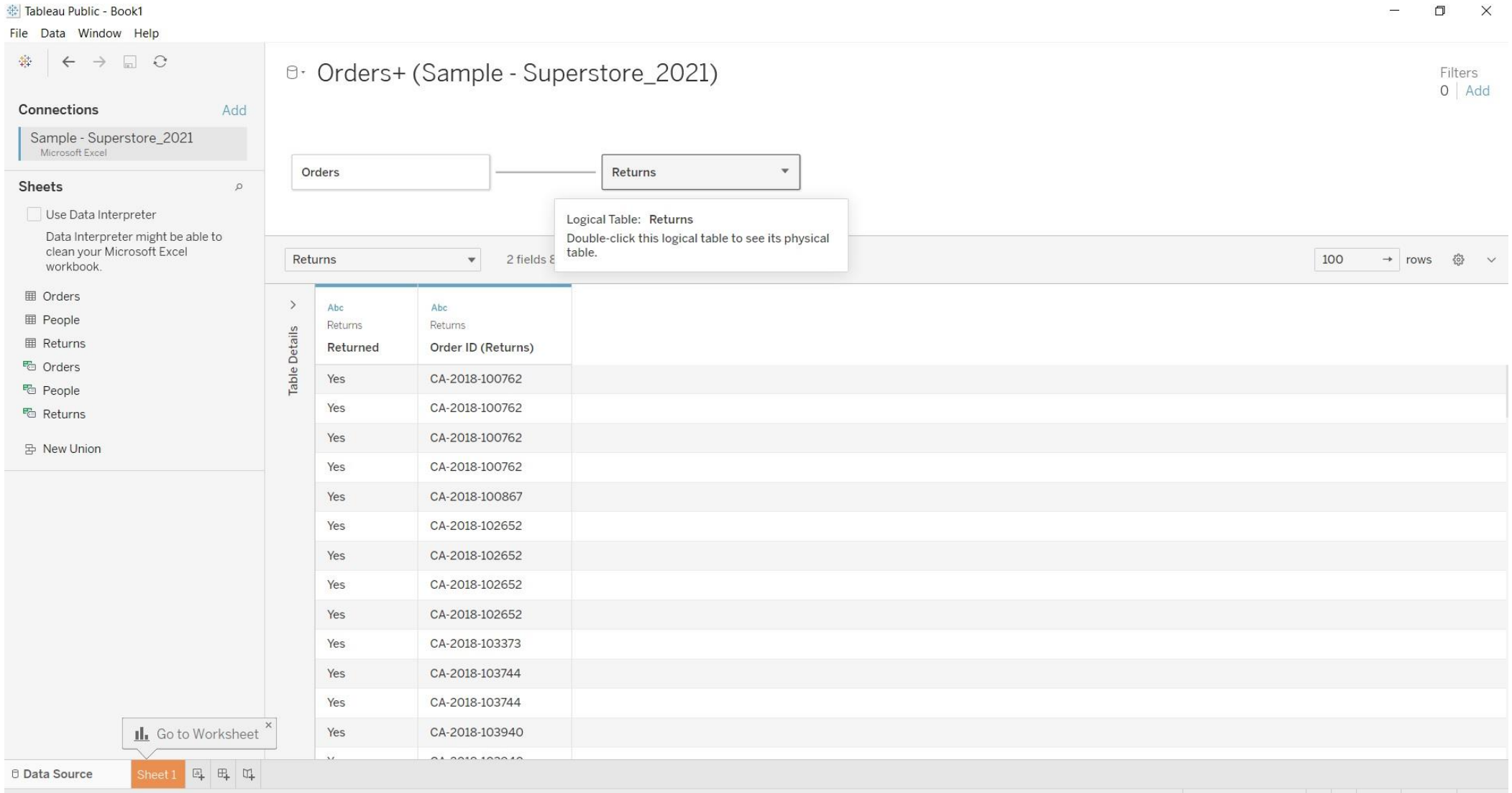
STEPS TO CREATE A RELATIONSHIP AND A JOIN

Step 3: Click on the first table i.e., **Orders** to get the view of **Logical Table of Orders**



STEPS TO CREATE A RELATIONSHIP AND A JOIN

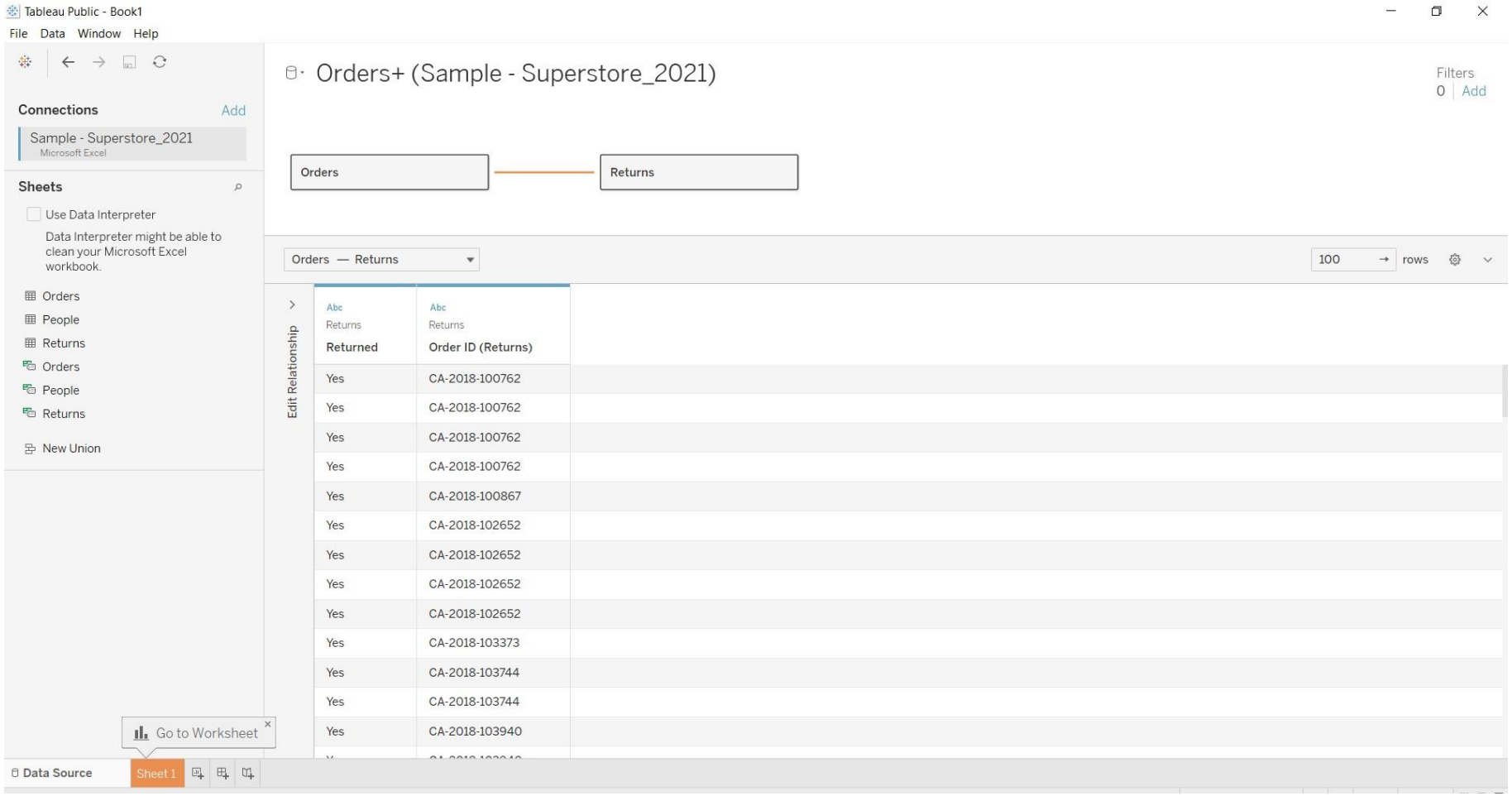
Step 4: Click on the second table i.e., **Returns** to get the view of **Logical Table of Returns**



STEPS TO CREATE A RELATIONSHIP AND A JOIN

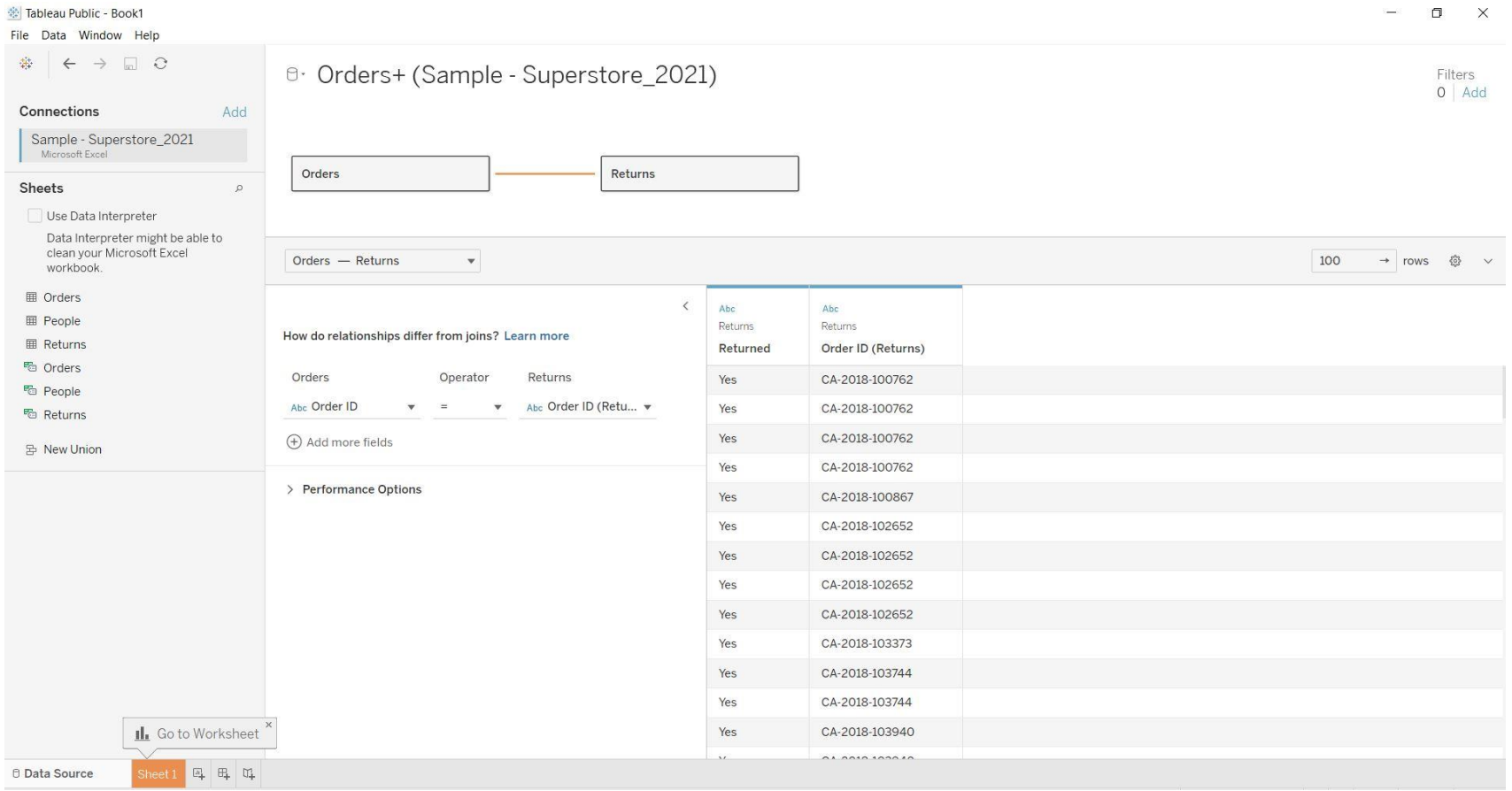
Step 5: Click on the **noodles** between the two table to get the view of Relationship

Click on **Edit Relationship**



STEPS TO CREATE A RELATIONSHIP AND A JOIN

Step 6: Tableau automatically attempts to create the relationship based on existing key constraints and matching fields to define the relationship.
For this example, the matching field is **Order ID**
If it can't determine the matching fields, we will need to select them.



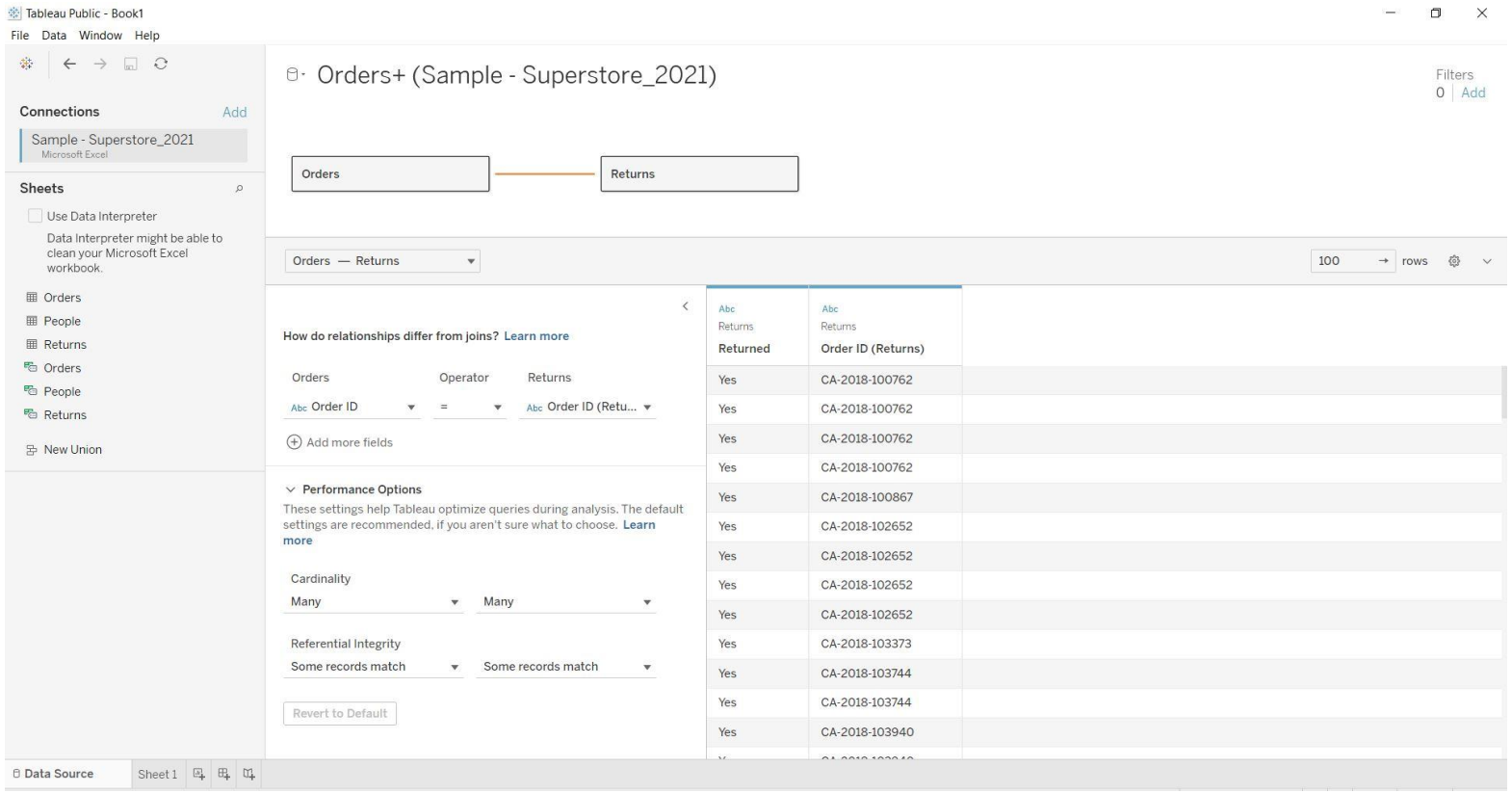
STEPS TO CREATE A RELATIONSHIP AND A JOIN

Step 7: We can check the Performance Options i.e., **Cardinality** and **Referential integrity**

If we are not aware of the required performance options, it is preferred to leave the default settings

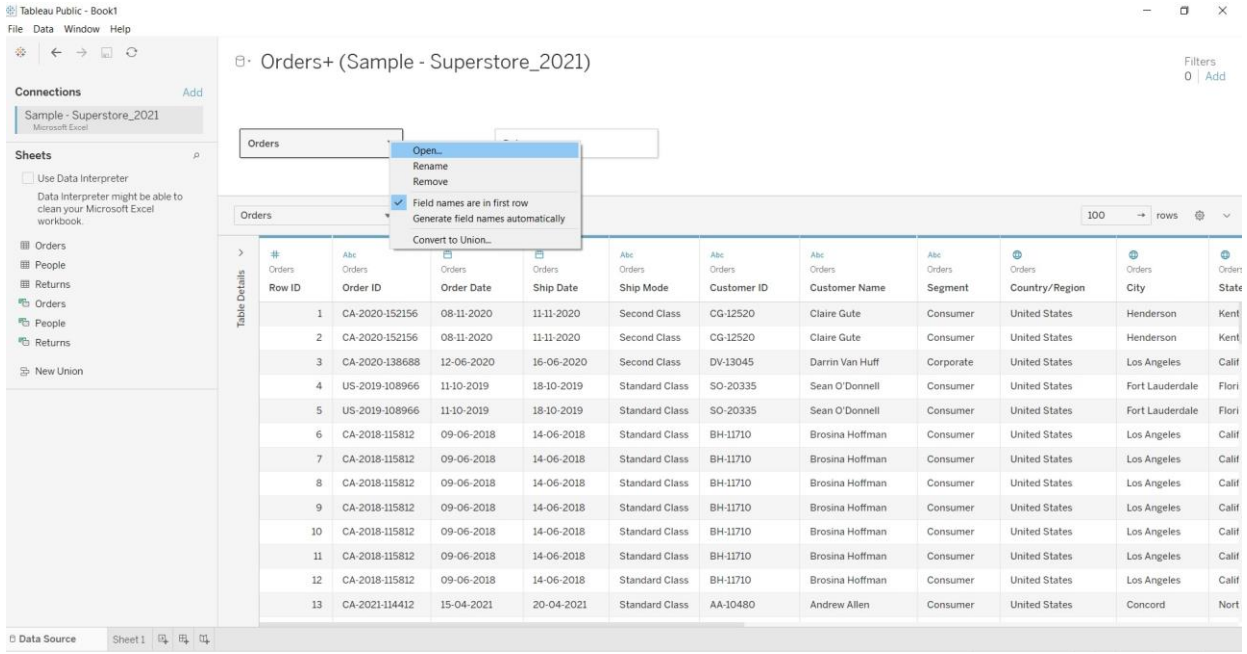
The default Performance Option settings are Many for cardinality and Some records match for referential integrity.

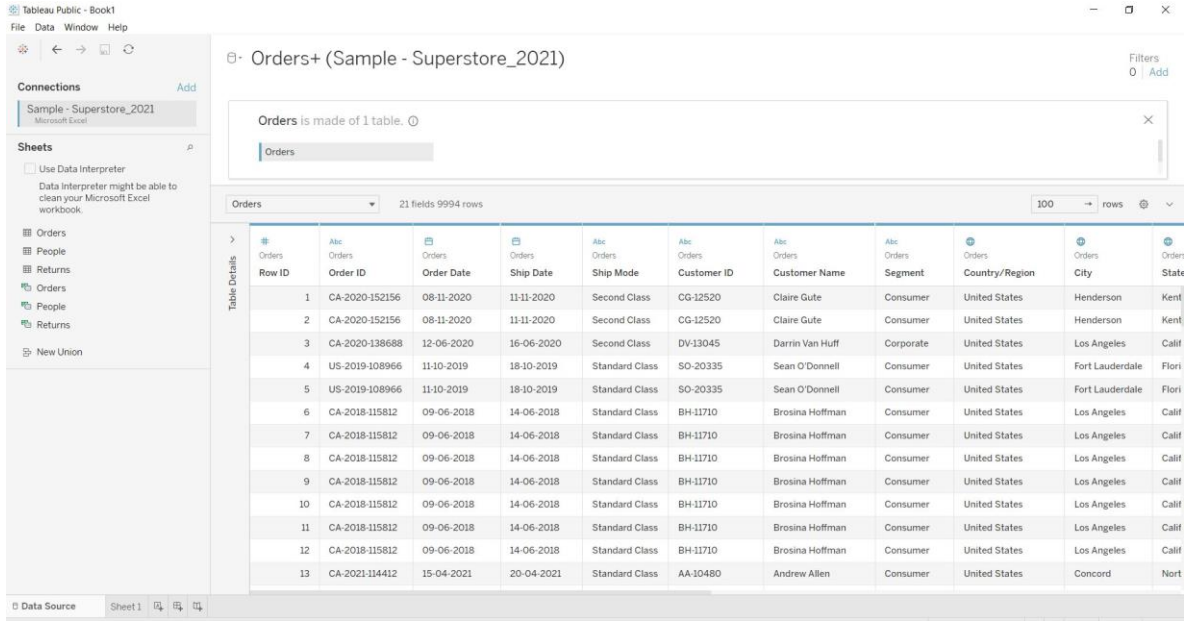
Tableau automatically optimize these for querying the database.



STEPS TO CREATE A RELATIONSHIP AND A JOIN

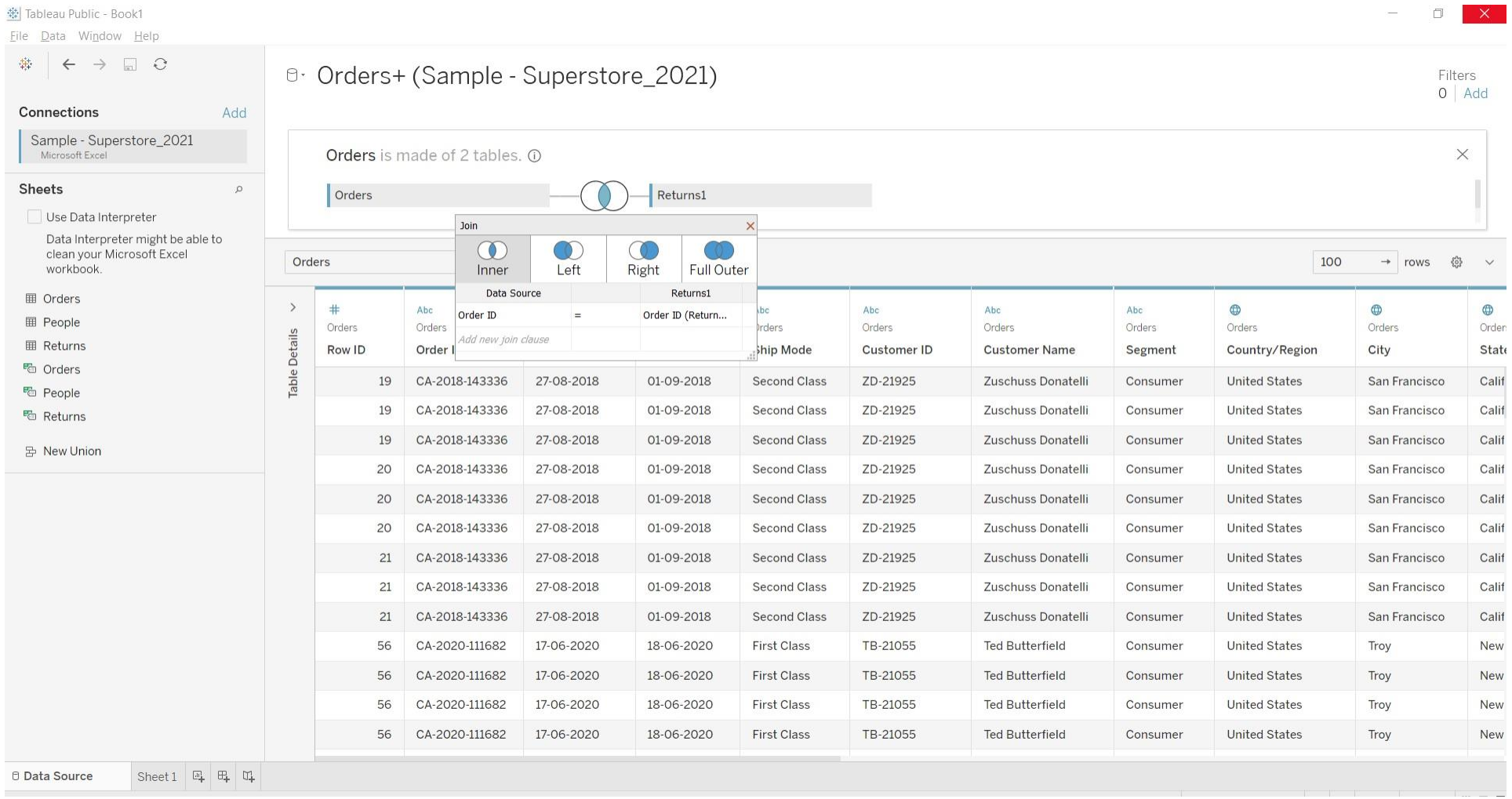
Step 8: We can click on the down-arrow at the end of logical table and click on **Open** (or) **Double-click** the Logical Table to go to the Physical layer





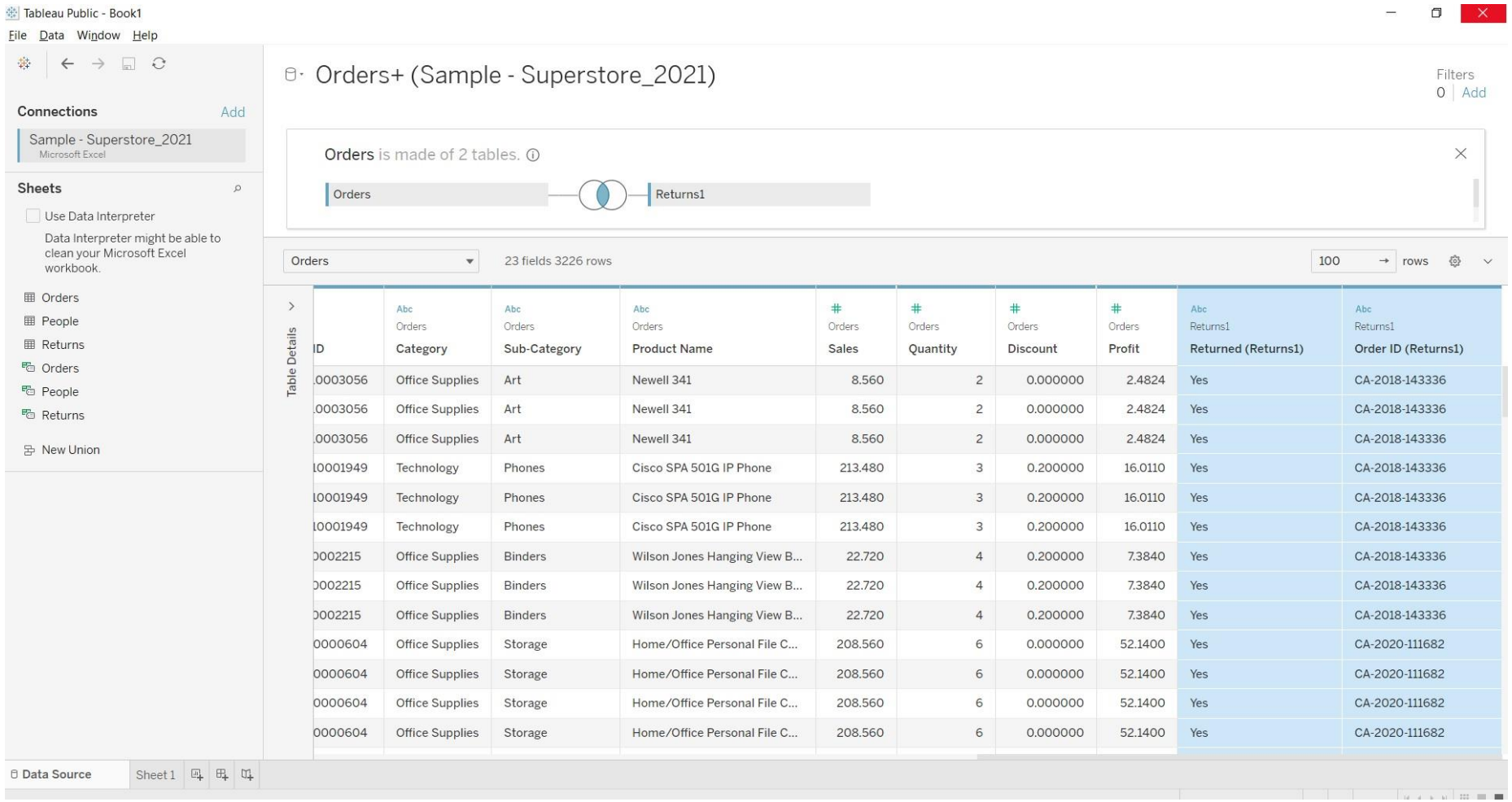
STEPS TO CREATE A RELATIONSHIP AND A JOIN

Step 9: Drag the second table **Returns table** to the canvas.
This forms an **Inner Join** by default



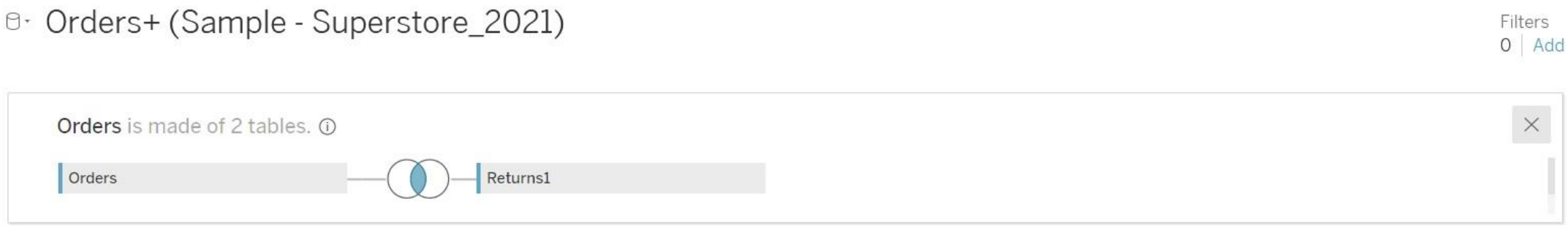
STEPS TO CREATE A RELATIONSHIP AND A JOIN

Step 10: Now we see both Order and Returns table as one **single flattened physical table**



STEPS TO CREATE A RELATIONSHIP AND A JOIN

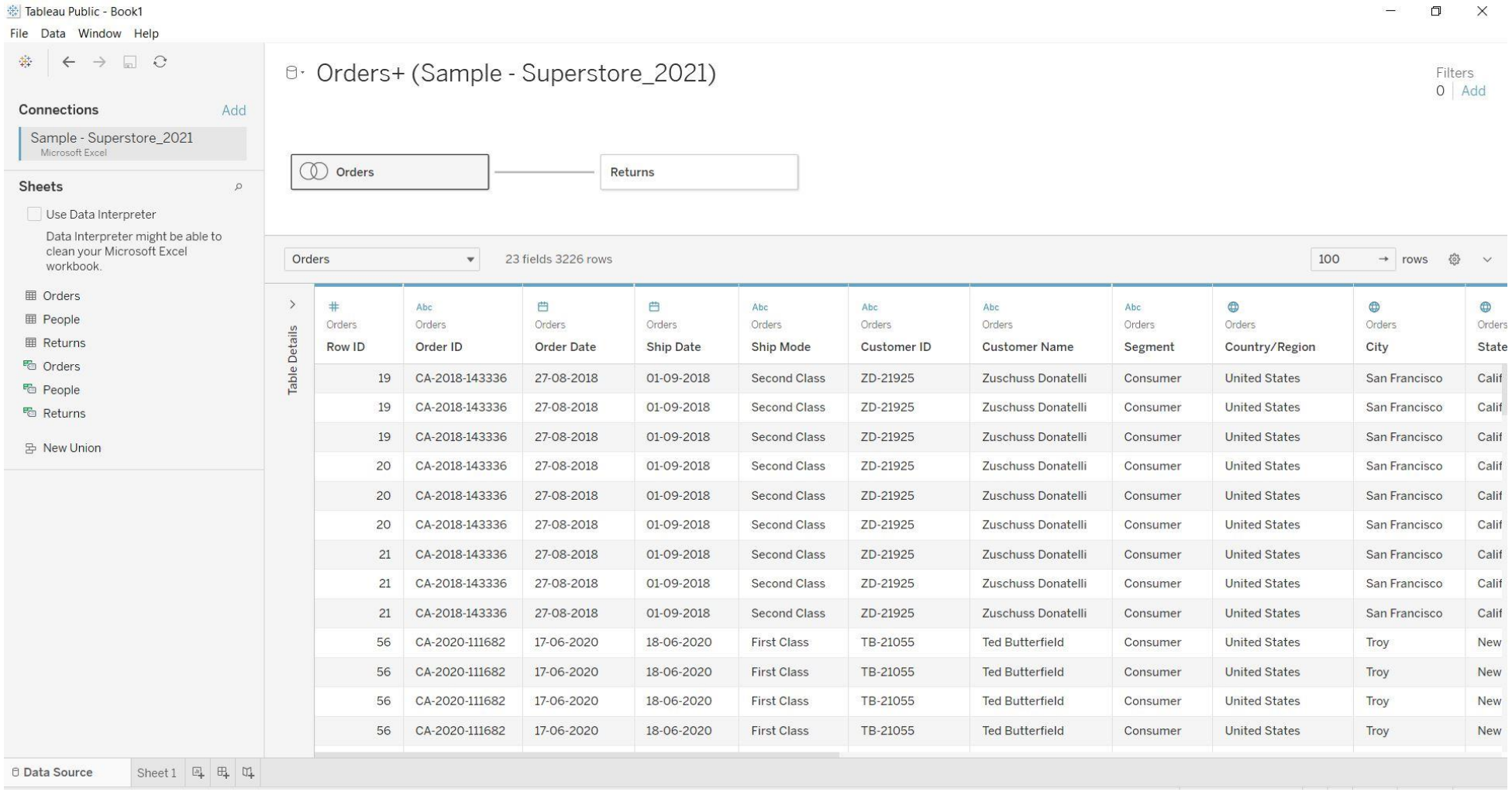
Step 11: Click on the **X** mark to exit from the **Physical layer**



STEPS TO CREATE A RELATIONSHIP AND A JOIN

Step 12: Now we are back in the **Logical layer canvas**

We are seeing the **Physical layer join** shown as a **Venn diagram** within the **Orders Logical Table**



RELATIONSHIPS (LOGICAL TABLES) VERSUS JOINS (PHYSICAL TABLES)

RELATIONSHIPS	JOINS
Defined between **logical tables** in the **Relationship canvas** (logical layer)	Defined between **physical tables** in the **Join/Union canvas** (physical layer)
Don't require the join type to be defined	Require join planning and join type
Act like **containers for tables** that are **joined or unioned**	Are **merged** into their **logical table**
Only **data relevant** to the **viz** is **queried**. Cardinality and referential integrity settings can be adjusted to optimize queries.	**Run as part of every query**
Level of detail is at the **aggregate for the viz**	**Level of detail** is at **the row level** for the **single table**
Join types are automatically formed by Tableau based on the context of analysis. Tableau determines the necessary joins based on the measures and dimensions in the viz	Join types are static and fixed in the data source, regardless of analytical context. Joins and unions are established prior to analysis and don’t change
Rows are not duplicated	**Merged table data can result in duplication**
Unmatched records are included in aggregates, unless explicitly excluded	Unmatched records are omitted from the merged data
Create independent domains at multiple levels of detail	Support scenarios that require a single table of data, such as extract filters and aggregation