Microsoft Fabric in a Day Lab Manual – **Lab 6**

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Course Material: GitHub.com/Lucid-Will/FabCon-EU-Zero-To-Hero-with-Fabric

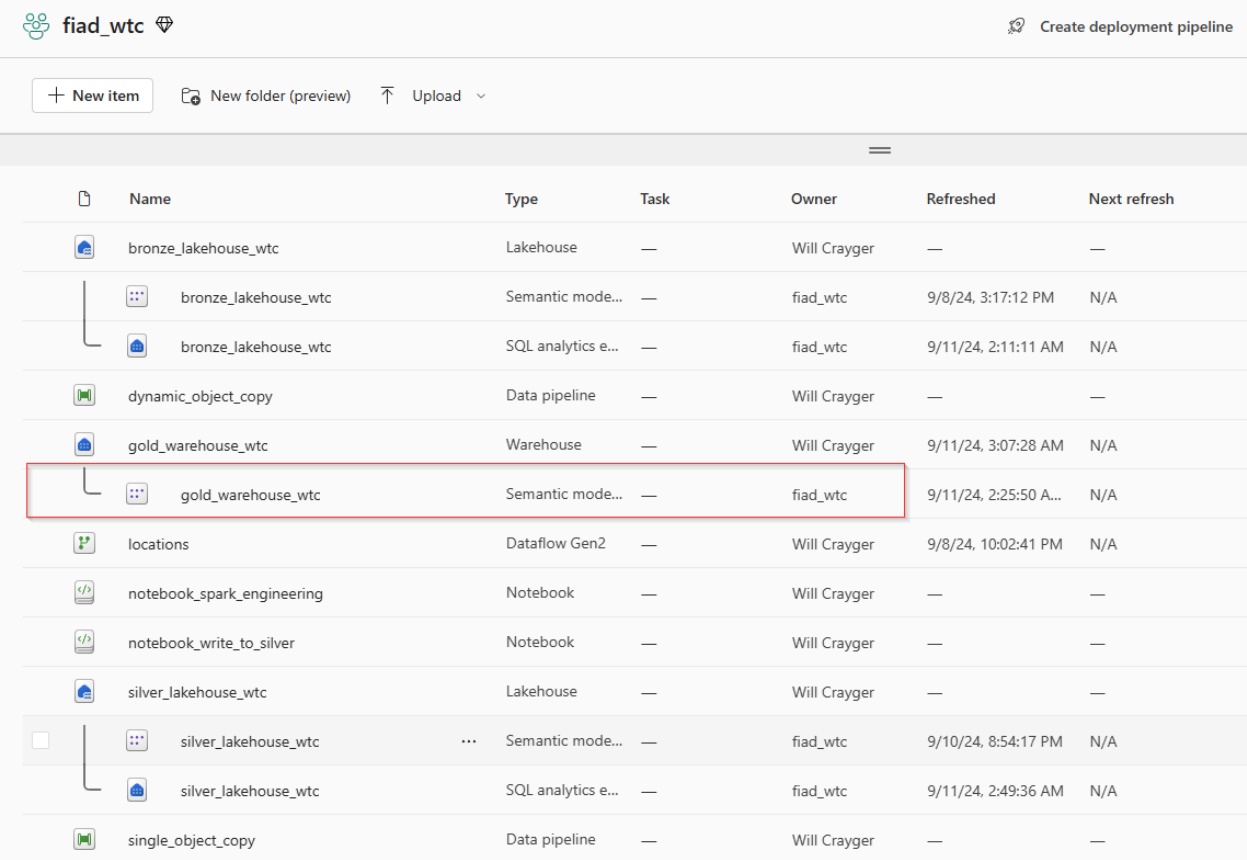
Data Analysis- Building Your Semantic Model and Reports in Fabric

Introduction:

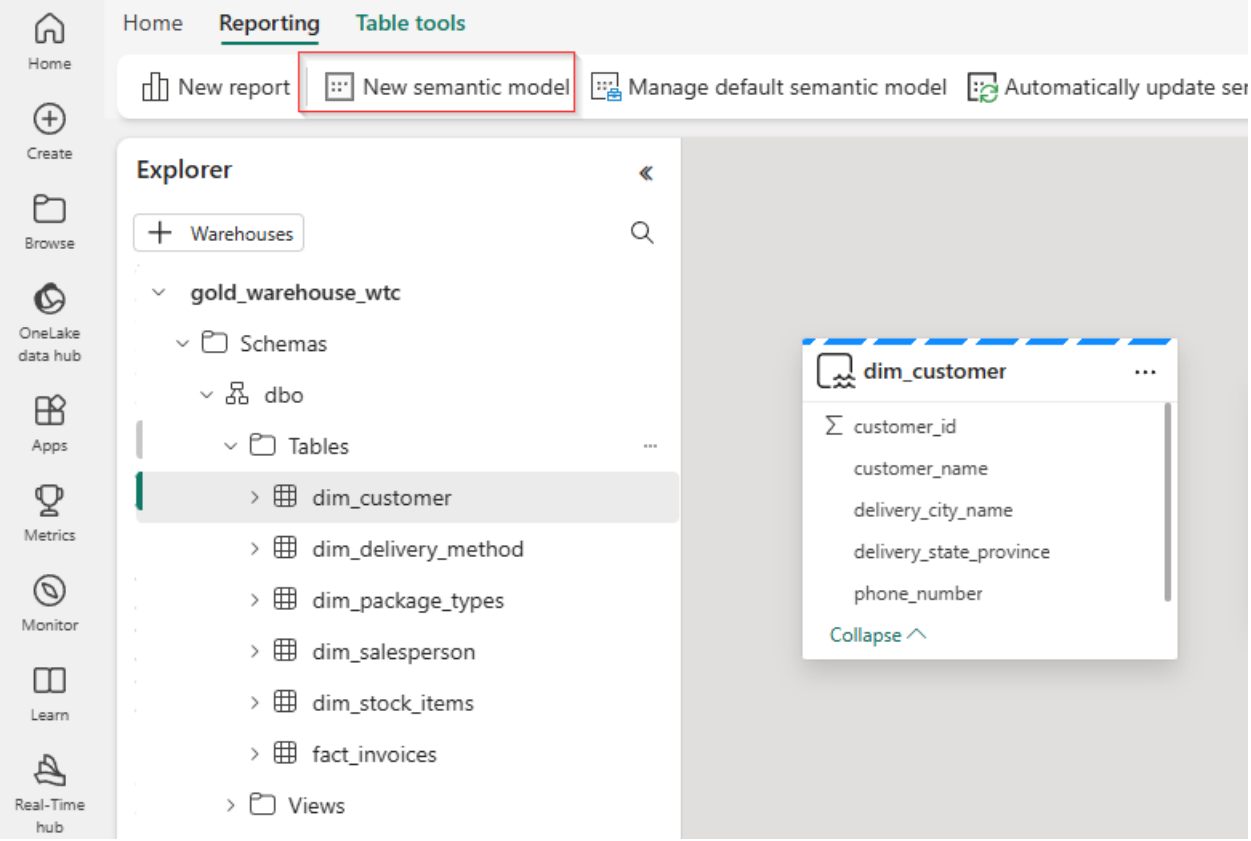
Now that the Data Warehouse has been loaded, you're ready to design the Semantic Model. The Semantic Model is the business representation of your data. It's where relationships between tables and calculations are created.

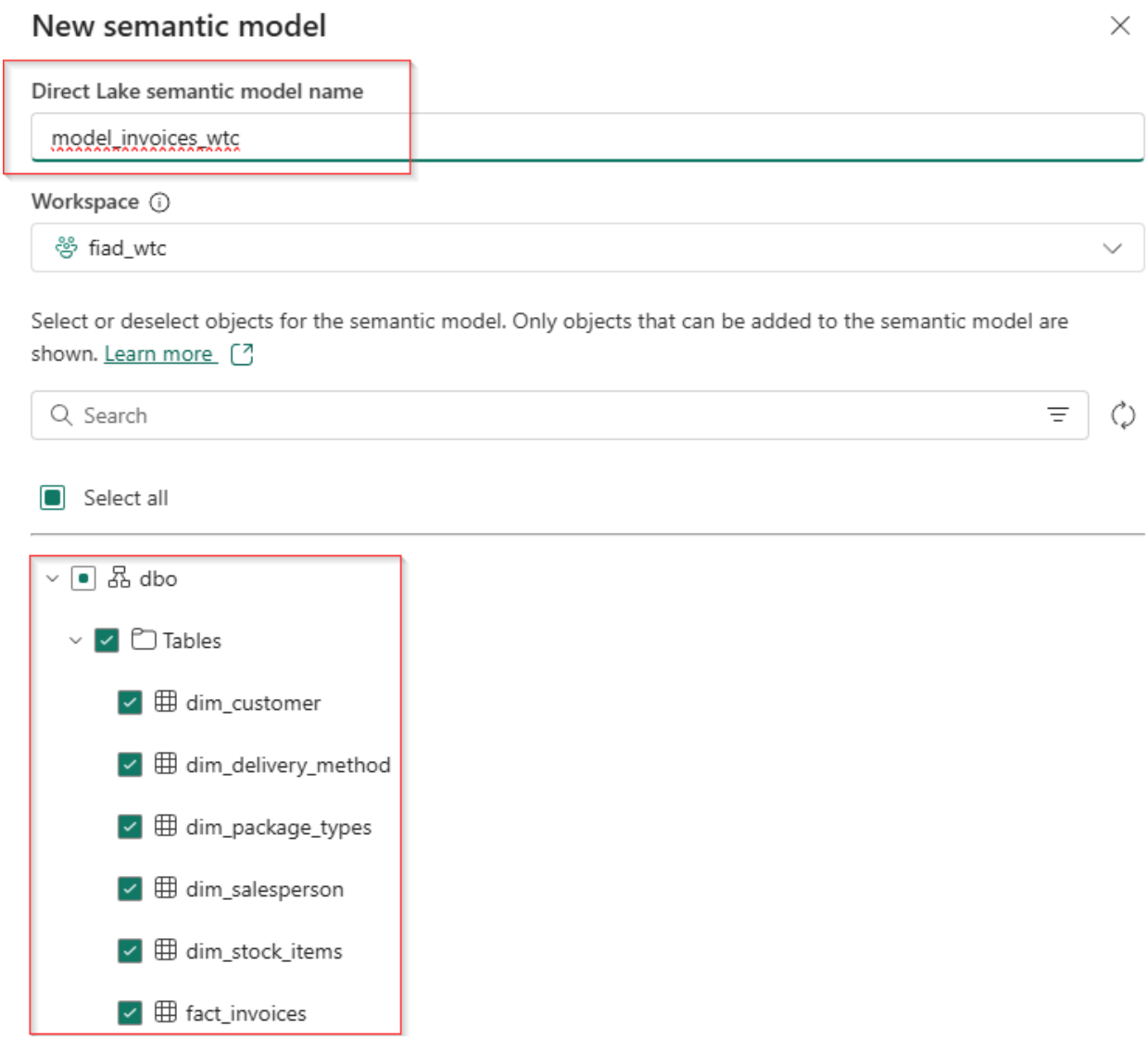
Part 1: Creating a New Semantic Model

Creating a New Semantic Model: To begin, navigate to the **Power BI** experience within your **Fabric Workspace** and click on the **Fabric Warehouse** that was created in **Lab 5**. Open the **Model** tab from the bottom of the Warehouse UI to launch the **semantic modeling** experience.



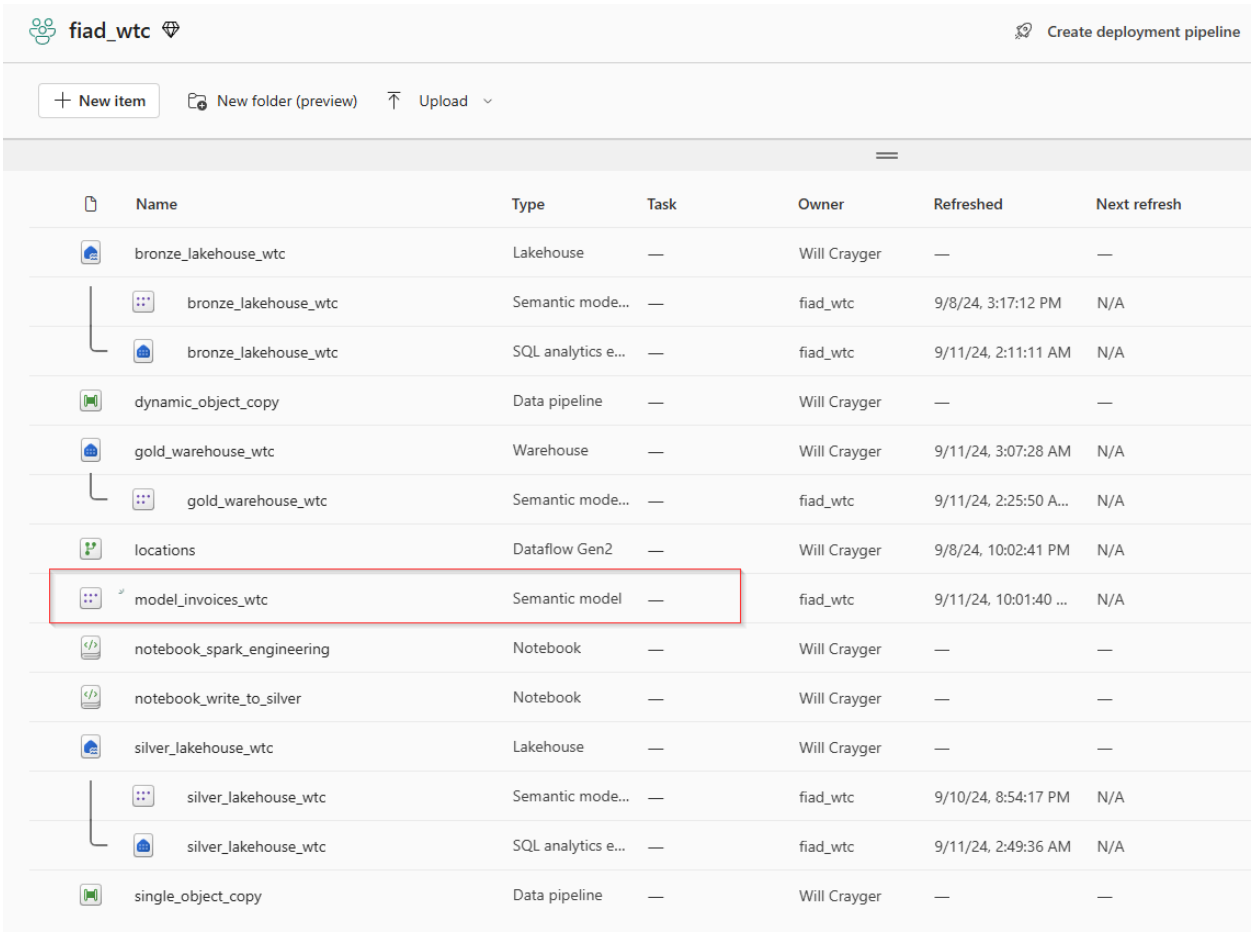
You will now see a list of all available tables in the data warehouse. Click the **Reporting** tab on the top ribbon and click **New semantic model**. Name the new semantic **model_invoices_{your_initials}.** Expand the **dbo** schema and check the box for **Tables** to add all tables from the warehouse and click **Confirm**.





Part 2: Designing the Semantic Model

Opening the modeling UI: If the new model does not open automatically, navigate to your **Workspace** landing page and select the new **semantic model**. Select **Open data model** from the top ribbon.


fiad_wtc
Create deployment pipeline
New item
New folder (preview)
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locations
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Will Crayger
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model_invoices_wtc
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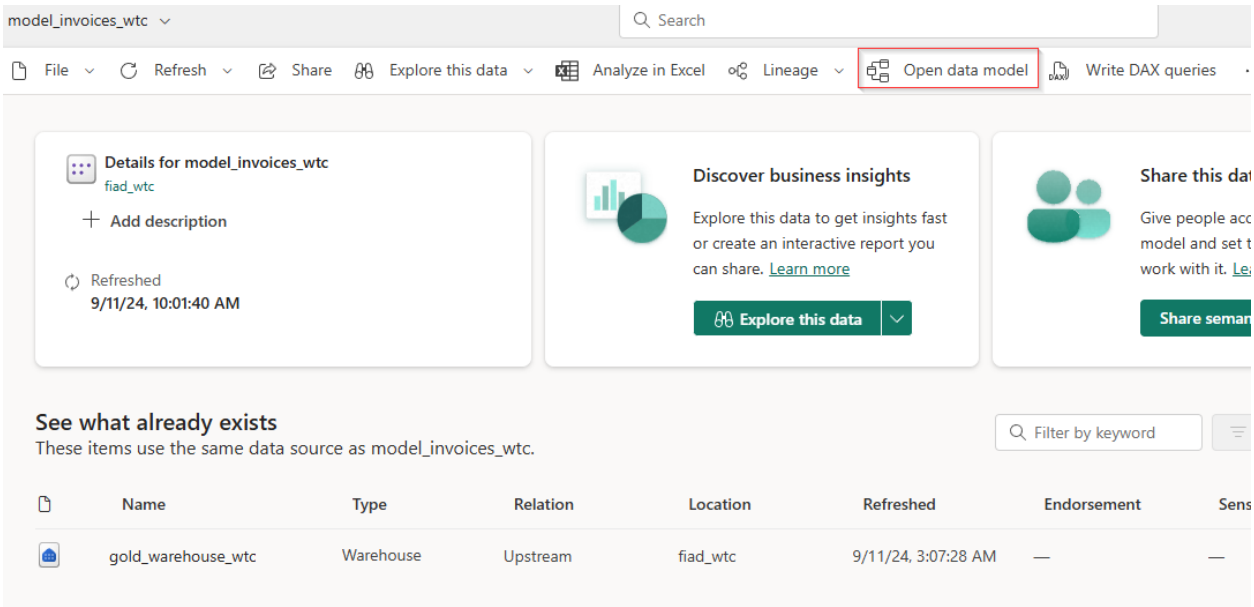
Data pipeline
Will Crayger


model_invoices_wtc
Search
File
Refresh
Share
Explore this data
Analyze in Excel
Lineage
Open data model
Write DAX queries
Details for model_invoices_wtc
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Discover business insights
Explore this data to get insights fast or create an interactive report you can share. Learn more
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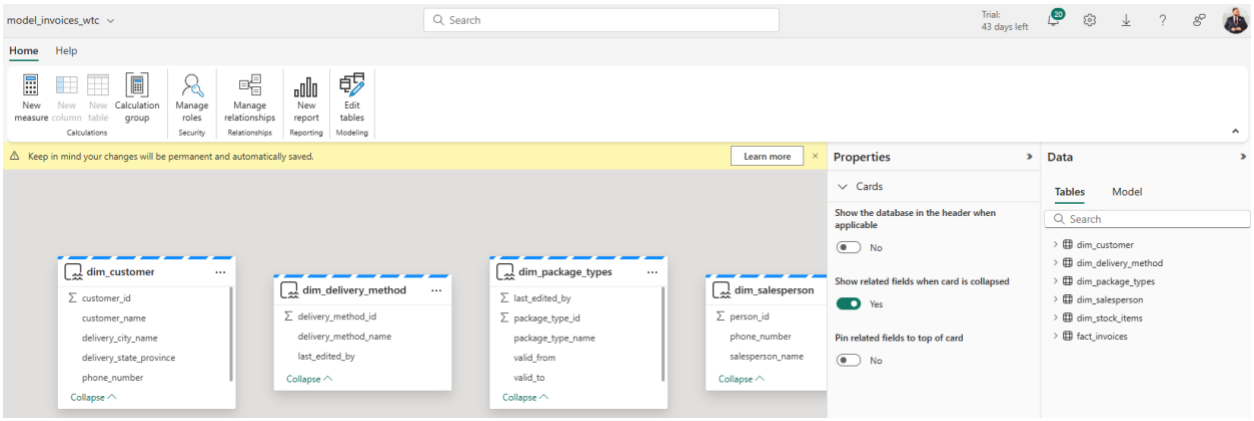
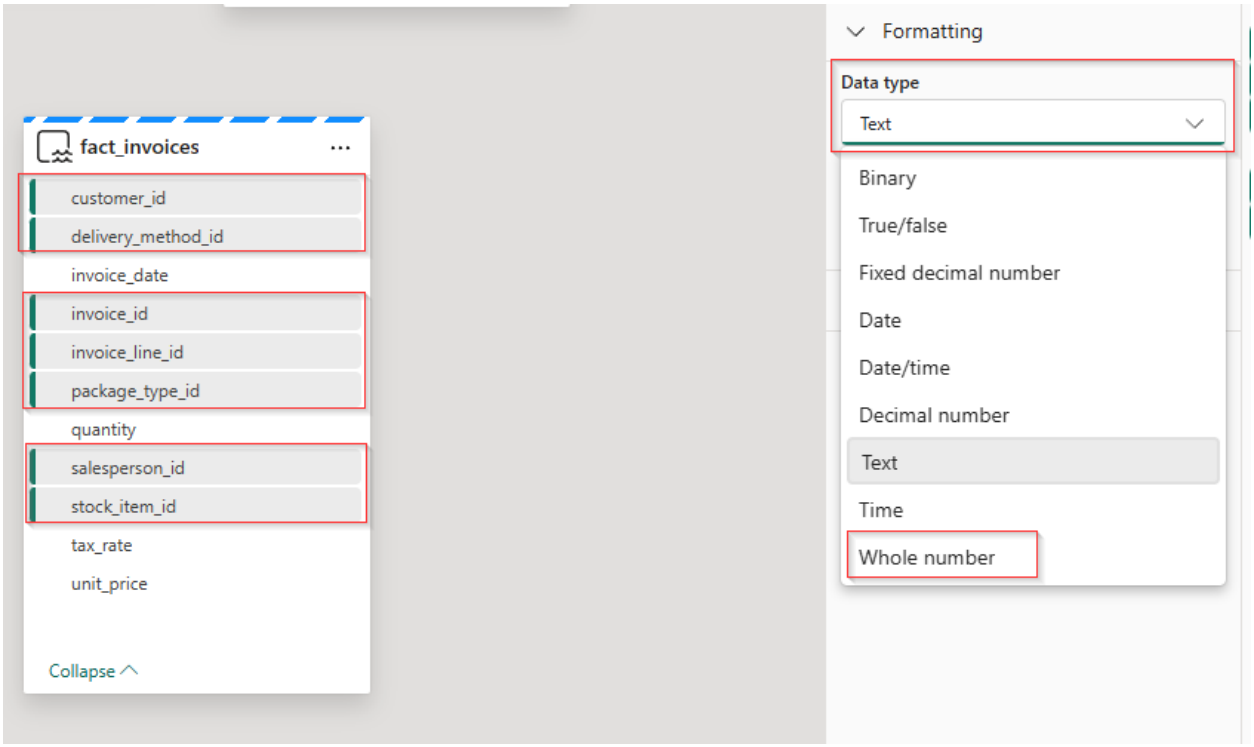


Configuring Data Types: To configure the data types for **fact_invoices**, use the **Properties Blade** of the **semantic model** UI.

Hold **Ctrl** and click all fields in the table that have a suffix of **_id**. From the **Properties Blade**, set the **Data Type** to **Whole Number**. When prompted by the **Data Type Change** notification, select **Yes**.

Next, update the remaining data types:

- Change **invoice_date** to **Date**.
- Set **quantity** to **Whole Number** with two decimal places.
- Change **tax_rate** and **unit_price** to **Fixed Decimal Number**.


fact_invoices
customer_id
delivery_method_id
invoice_date
invoice_id
invoice_line_id
package_type_id
quantity
salesperson_id
stock_item_id
tax_rate
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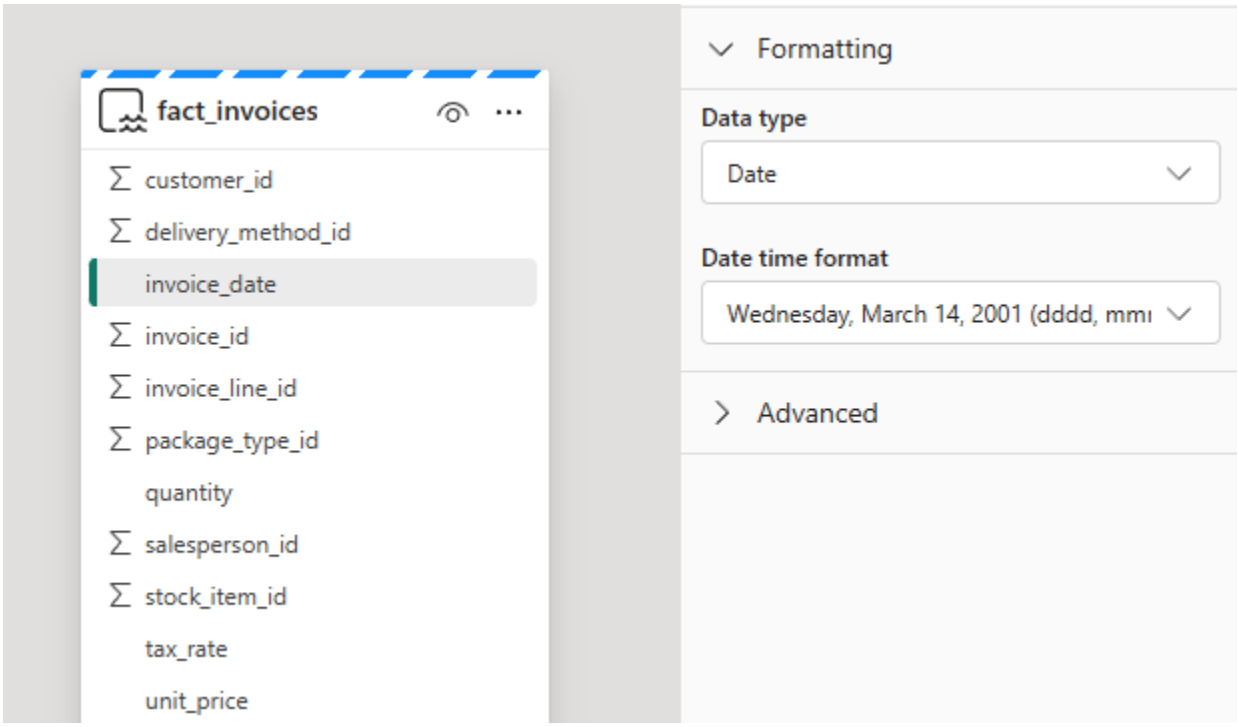
Collapse
Formatting
Data type
Text
Binary
True/false
Fixed decimal number
Date
Date/time
Decimal number
Text
Time
Whole number


fact_invoices
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invoice_line_id
package_type_id
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Formatting
Data type
Date
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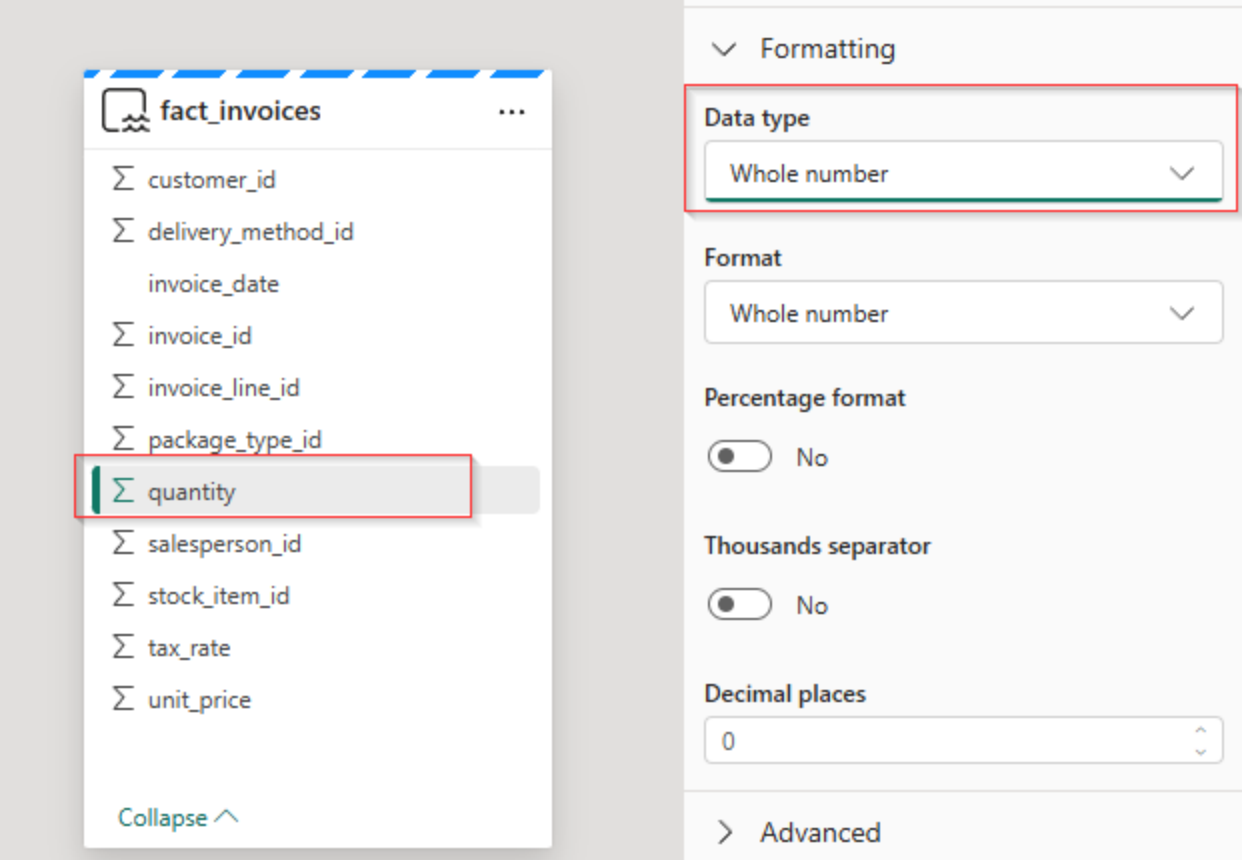
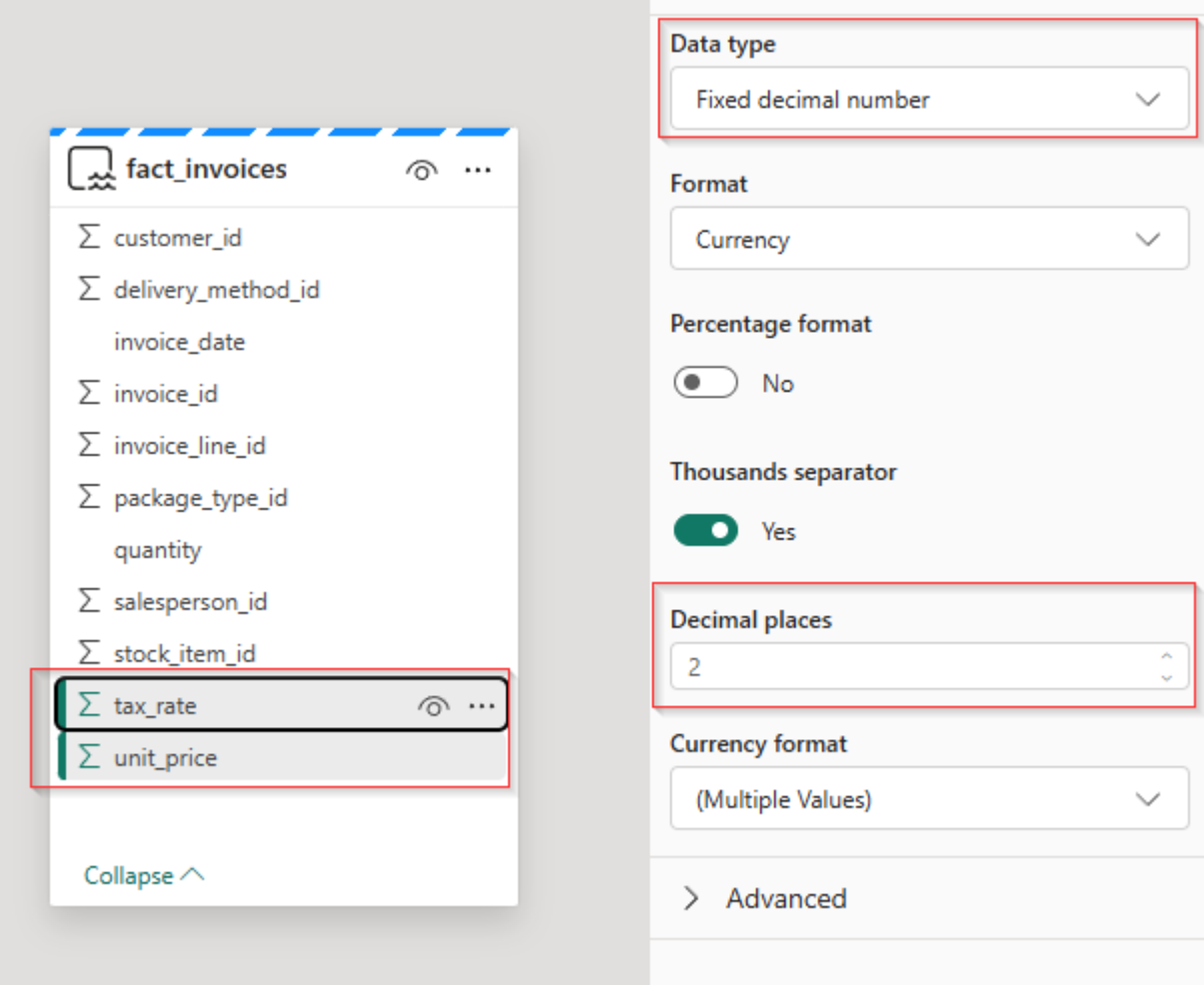
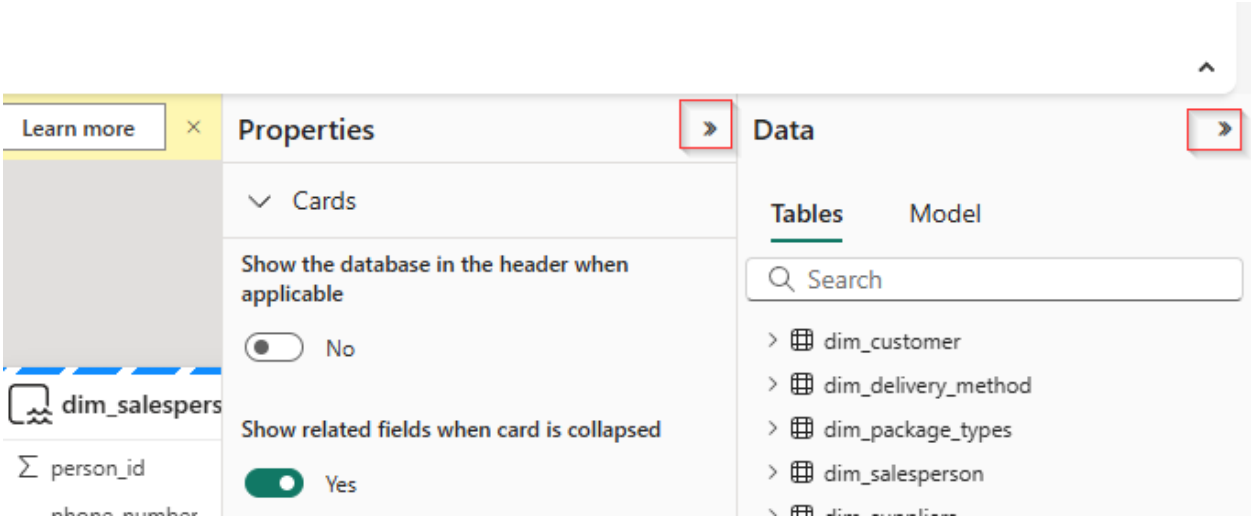
Advanced


fact_invoices
customer_id
delivery_method_id
invoice_date
invoice_id
invoice_line_id
package_type_id
quantity
salesperson_id
stock_item_id
tax_rate
unit_price
Collapse
Formatting
Data type
Whole number
Format
Whole number
Percentage format
No
Thousands separator
No
Decimal places
0
Advanced



Defining table relationships: Begin by collapsing the navigational blades as needed to give yourself more viewing space. Create a relationship between **dim_salesperson** and **fact_invoices. Click and drag** the **salesperson_id** field from **fact_invoices** to the **person_id** field on **dim_salesperson** and release. In the **New Relationship** tab, confirm **fact_invoice** as **From table** and **dim_salesperson** is **To table** and confirm the correct columns are highlighted. Set **Cardinality** to **many-to-one**, and choose **Cross-Filter Direction** as **Single**, then click **Save**. You will now see a relationship between the **dim_salesperson** and **fact_invoices** table in the modeling UI. Pay close attention to the **Cross-Filter Direction** for each join.


Learn more
Properties
Data
Cards
Show the database in the header when applicable
No
Show related fields when card is collapsed
Yes
Tables
Model
Search
dim_customer
dim_delivery_method
dim_package_types
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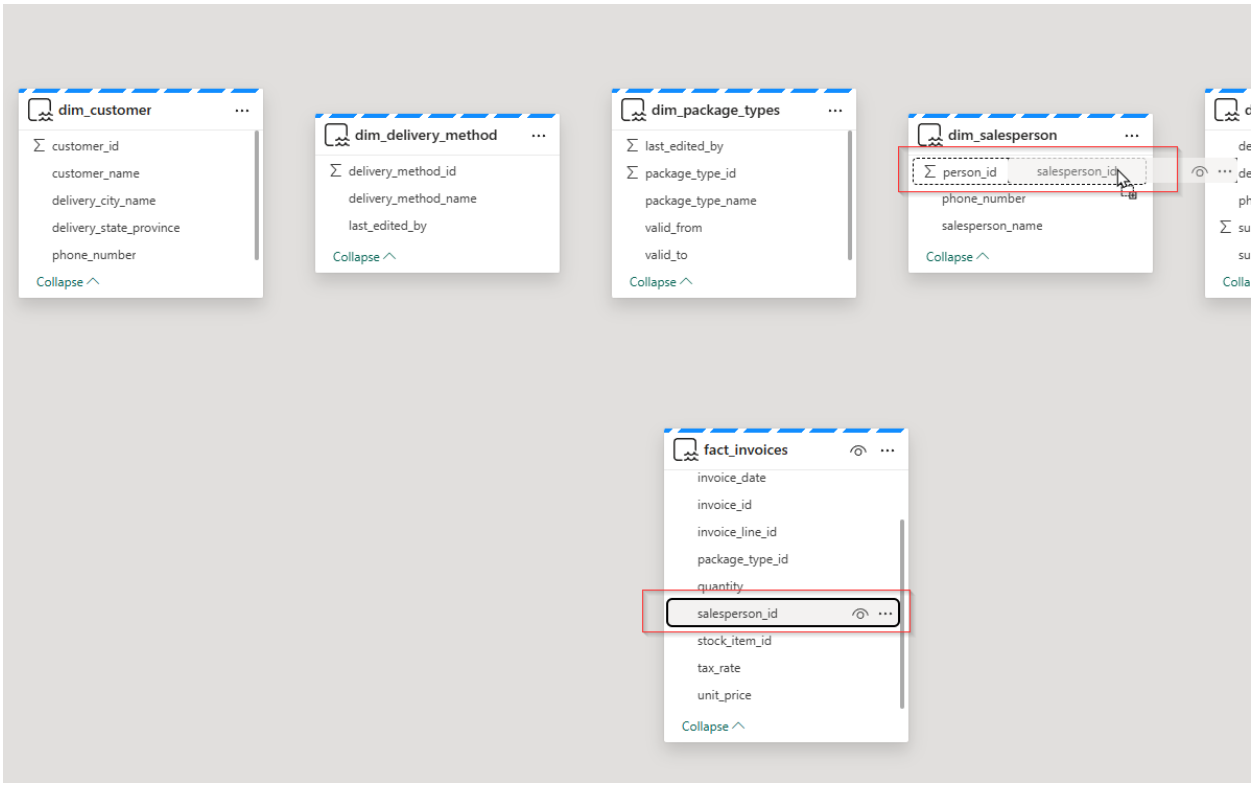
person_id


dim_customer
customer_id
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phone_number
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fact_invoices
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stock_item_id
tax_rate
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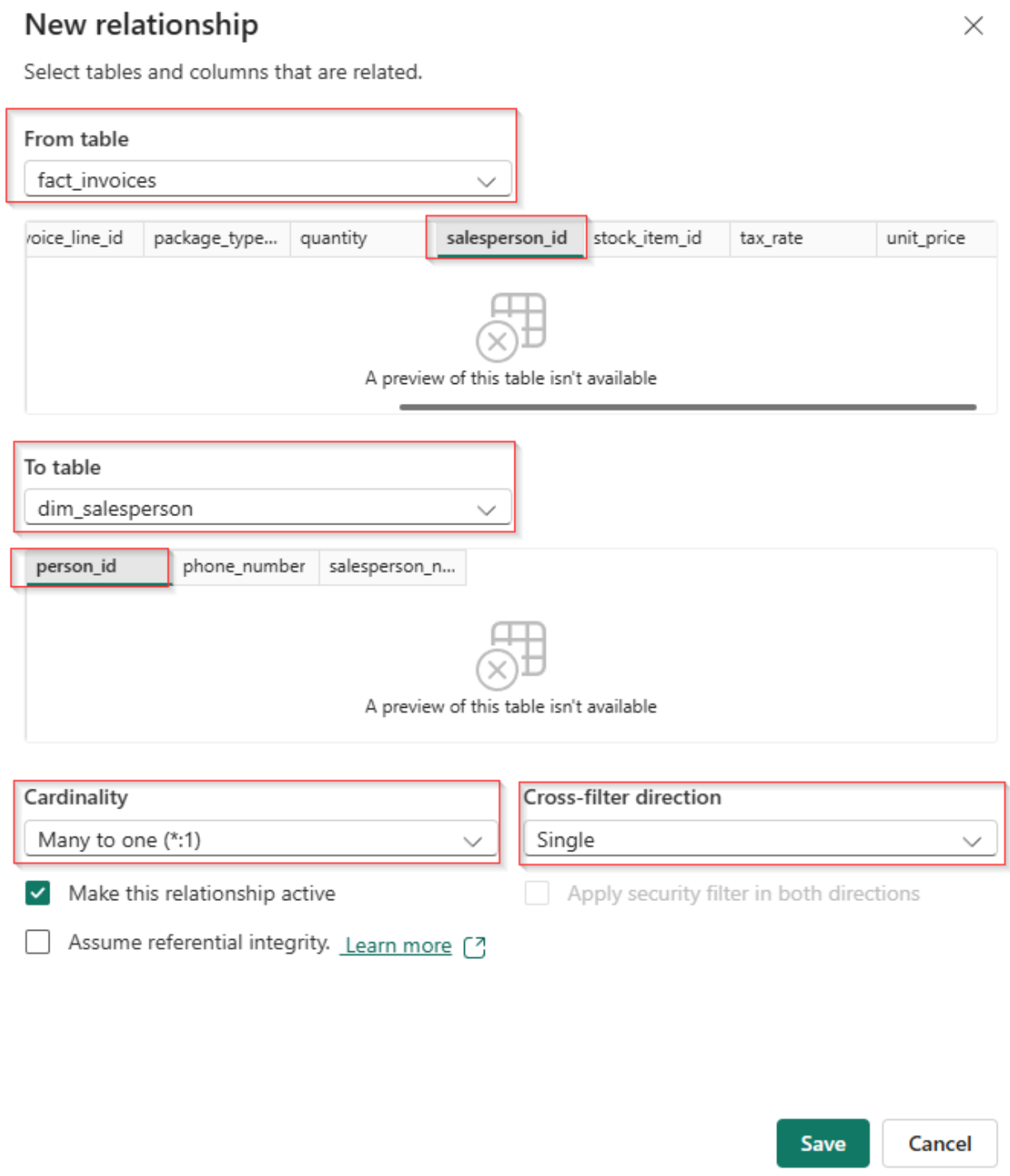
New relationship
Select tables and columns that are related.
From table
fact_invoices
voice_line_id
package_type...
quantity
salesperson_id
stock_item_id
tax_rate
unit_price
A preview of this table isn't available
To table
dim_salesperson
person_id
phone_number
salesperson_n...
A preview of this table isn't available
Cardinality
Many to one (*:1)
Cross-filter direction
Single
Make this relationship active
Apply security filter in both directions
Assume referential integrity.
Learn more
Save
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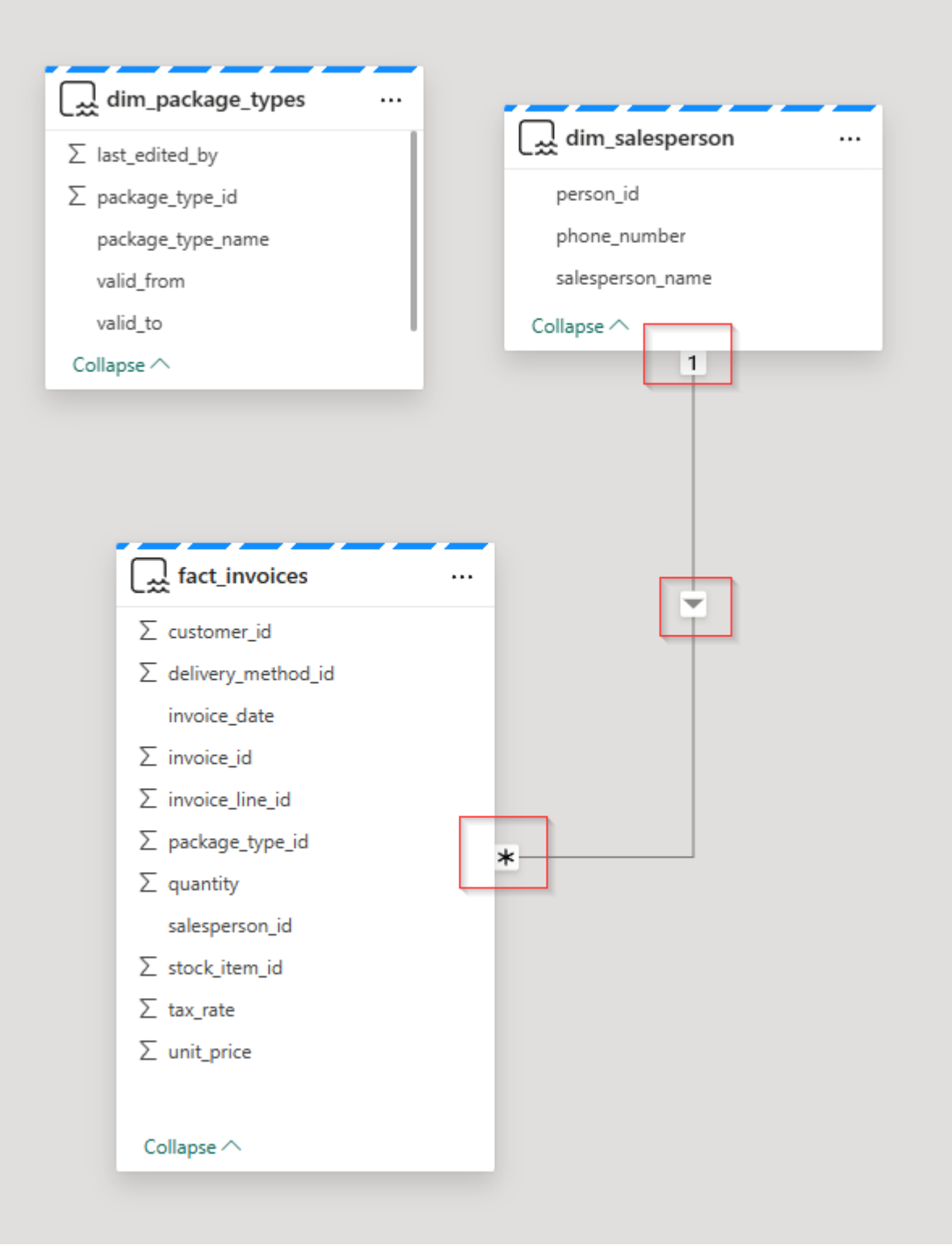
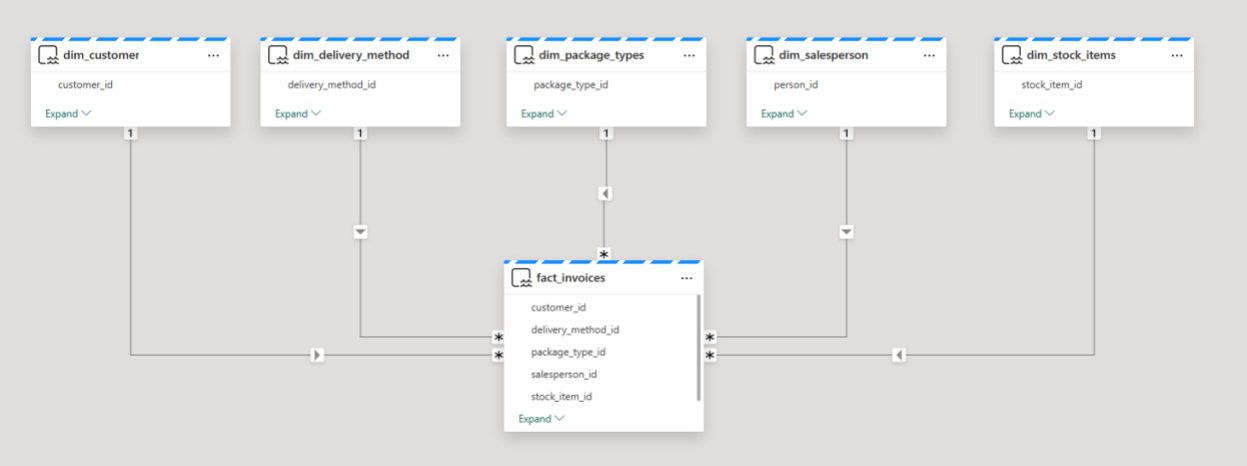


Repeat the steps above (5-7) for the remaining dimension tables using the following mappings:

- **fact_invoices.customer_id**-> **dim_customer.customer_id**

- **fact_invoices.delivery_method_id -> dim_deliver_method.delivery_method_id**
- **fact_invoices.package_type_id -> dim_package_types. package_type_id**
- **fact_invoices.stock_item_id -> dim_stock_items. stock_item_id**

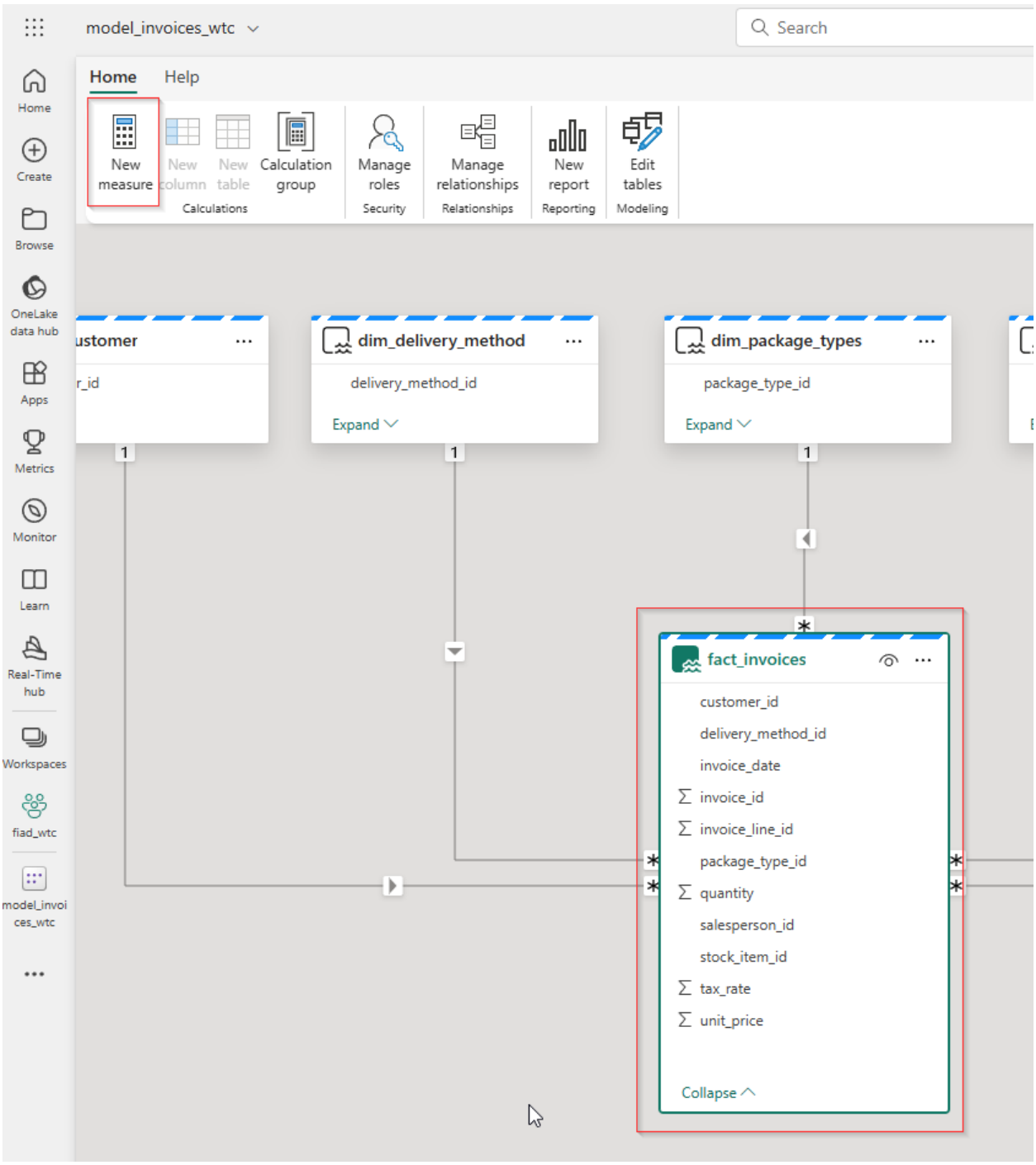


Creating Measures for Aggregation: To add measures for aggregation, click on the **fact_invoices** table from the Explorer and select **New Measure** from the top ribbon. The expression bar for creating a measure will appear at the top. Created the **Extended** Amount measure by adding the following DAX to the expression box:

```
Extended Amount =
SUMX(
   fact_invoices
   ,fact_invoices[unit_price] * fact_invoices[quantity]
)
```

Select **New Measure** again and create the **Tax Amount** measure with the below DAX. Also apply formatting to format the measure as Currency with 2 decimal places.

```
Tax Amount =
SUMX(
   fact_invoices
   ,(fact_invoices[unit_price] * fact_invoices[quantity]) * (fact_invoices[tax_rate] / 100)
)
```


model_invoices_wtc
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Learn
Real-Time hub
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tax_rate
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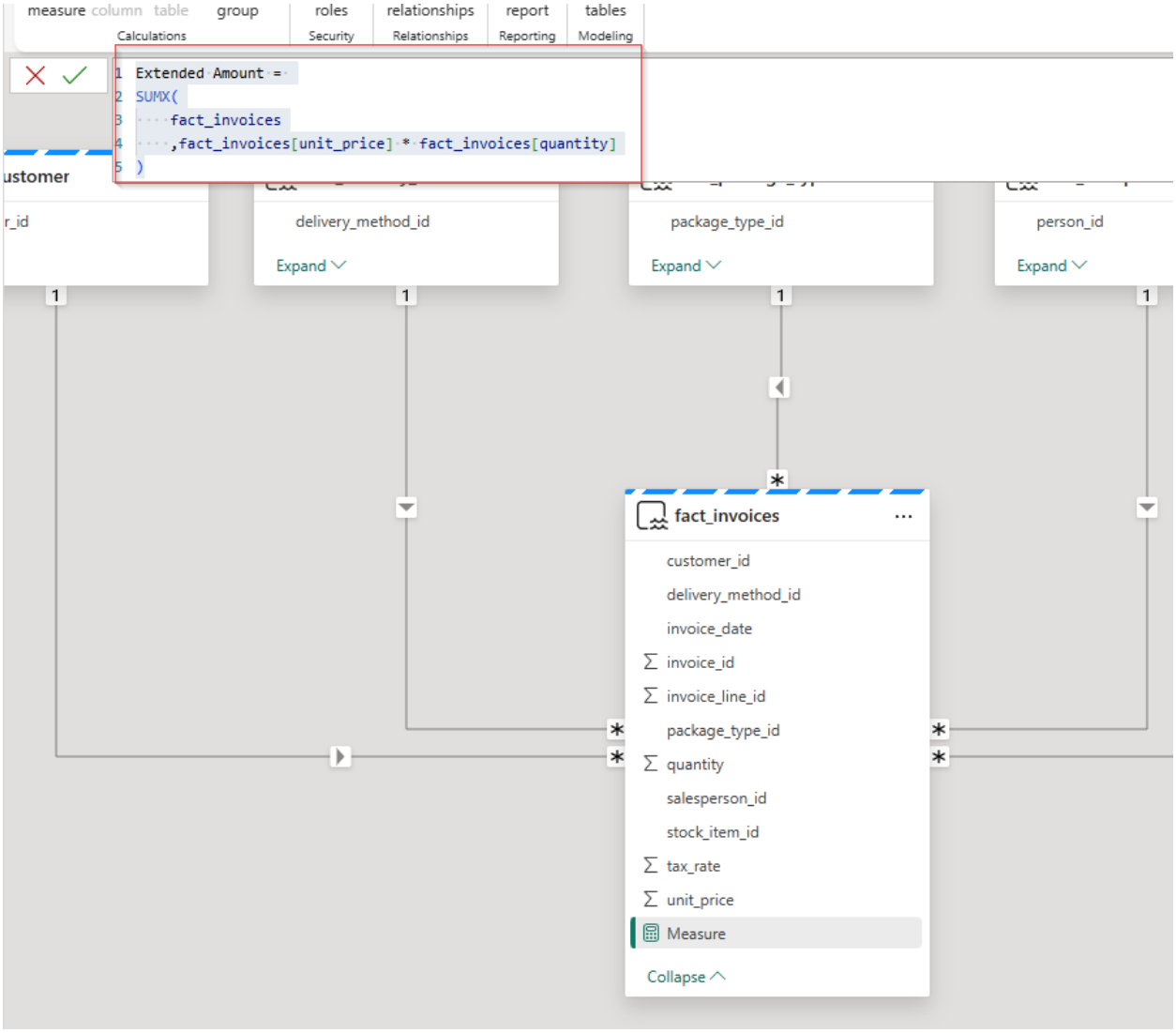
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2 SUMX(
3 fact_invoices
4 ,fact_invoices[unit_price] * fact_invoices[quantity]
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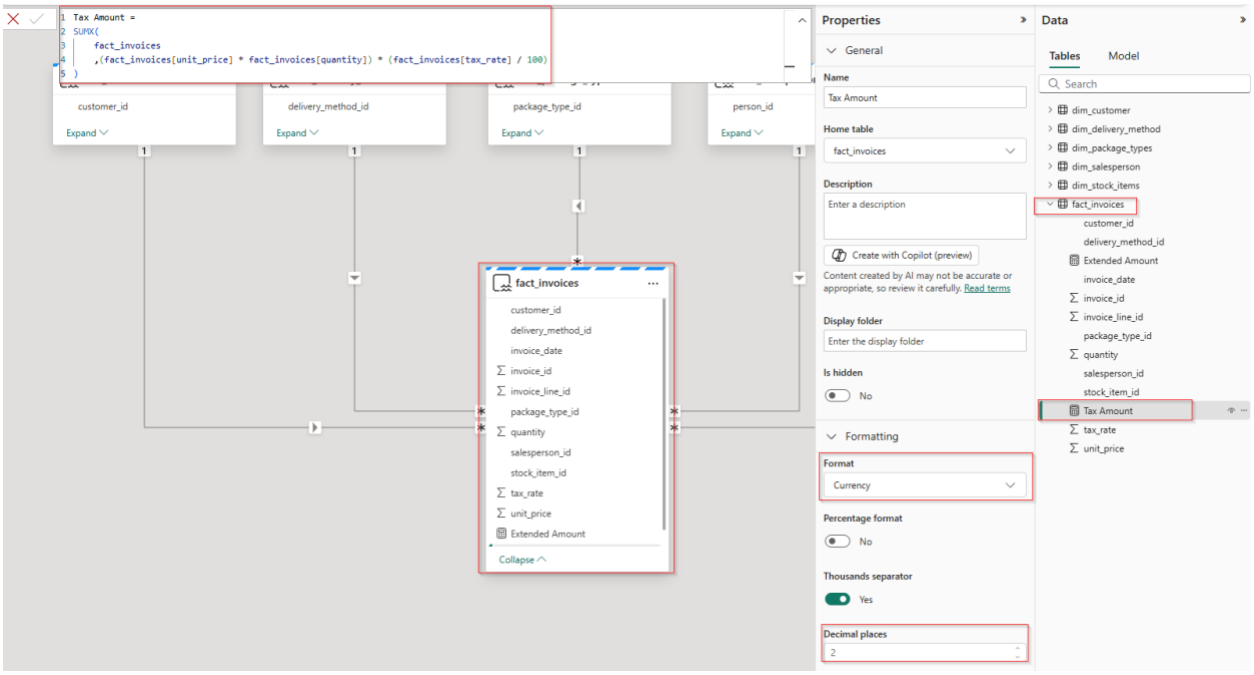
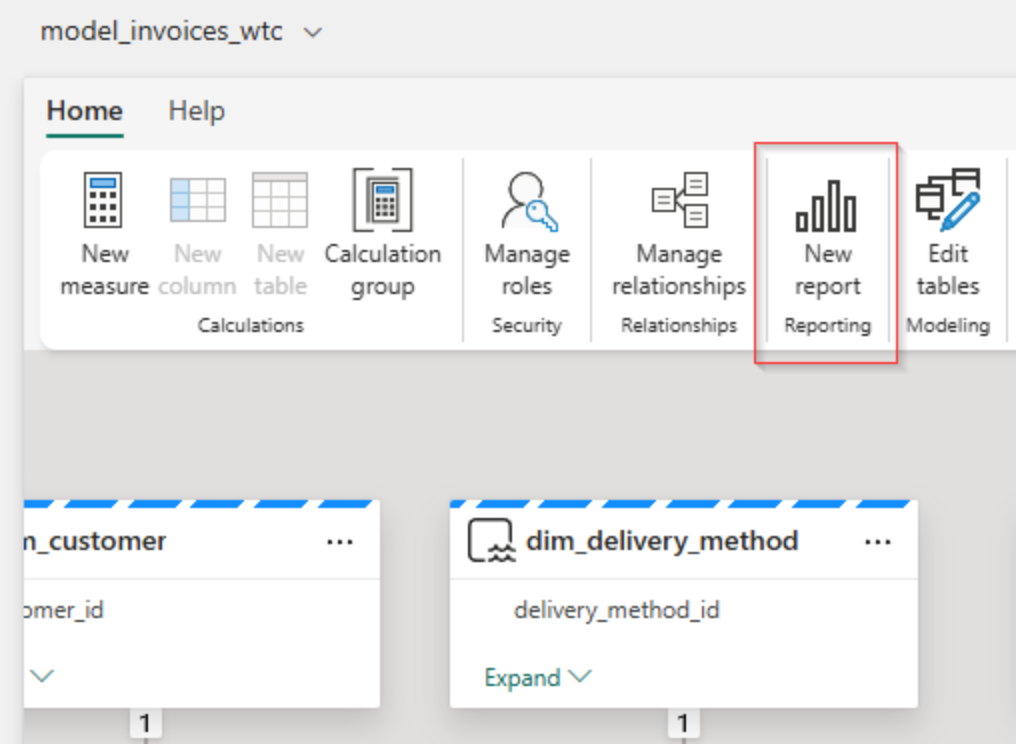


Part 2: Visualizing Your Data via Custom Power BI Report

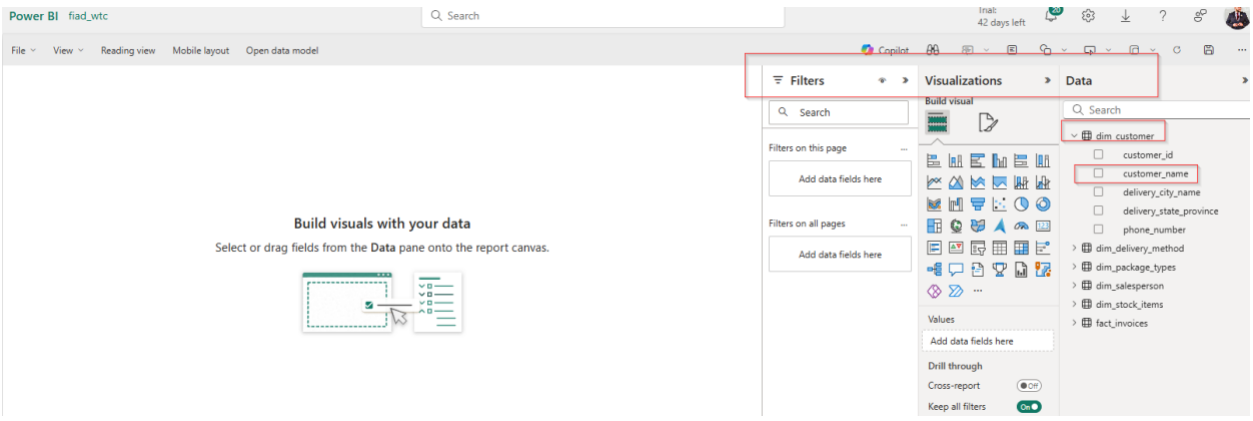
Visualizing Your Data via Custom Power BI Report: Once the **Semantic Model** has been defined, you are ready to begin visualizing the data using **Power BI**. One of the unique aspects of **Fabric** is that all modeling and reporting activities can be done directly through the browser. However, you can still use **Power BI Desktop** if needed.

To begin, select the **New** report option from the Home navigation bar or navigate to the **Power BI** experience in your **Fabric Workspace** and select the **model_invoice Semantic Model**. From the navigation tiles, click the dropdown for **Explore This Data** and choose **Create a Blank Report**.



You will see a familiar report development experience, resembling the current web-based **Power BI** report creation environment:

- The **Data Blade** contains all available objects from your semantic model.
- The **Visualization Blade** allows you to select the type of visualization to use.
- The **Filters Blade** provides options for visual, page, and report-level filters.



Next, click the down arrow next to **dim_customer** in the **Data Blade** and check the box next to **customer_name** to create the first visualization on your canvas. Click on the table that was created to select it.

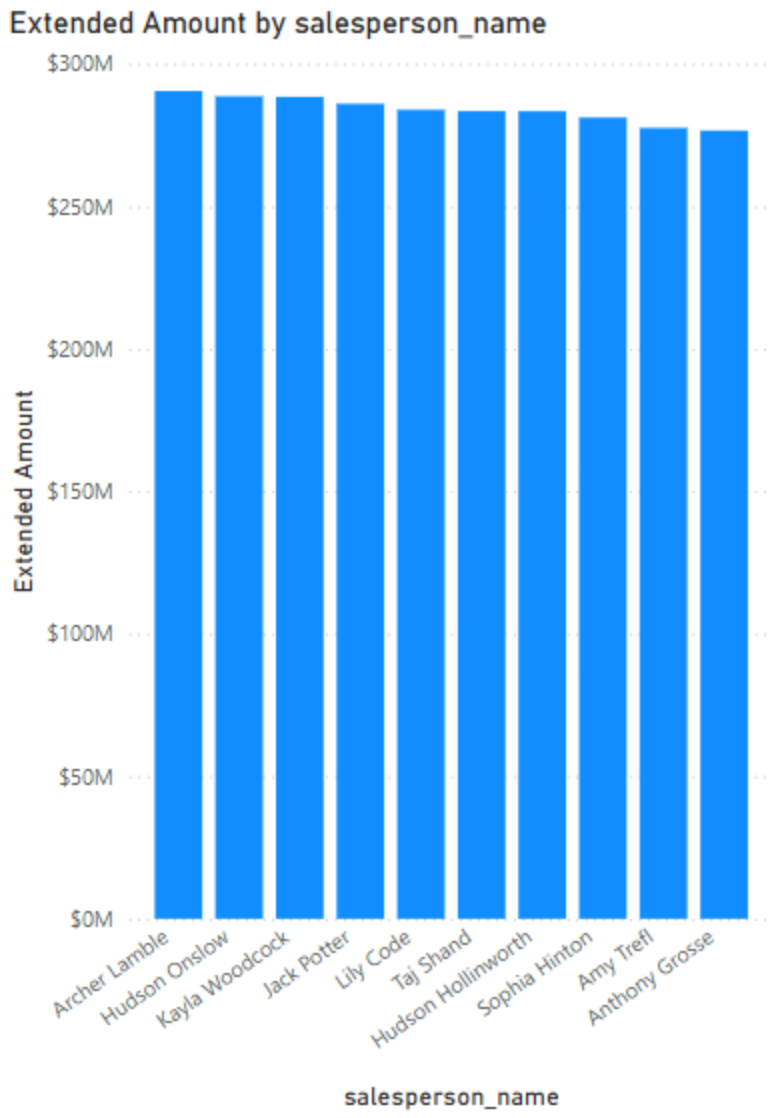
Repeat this process for the following tables and fields:

- **dim_customer.delivery_state_province_name**
- **dim_customer.delivery_city_name**

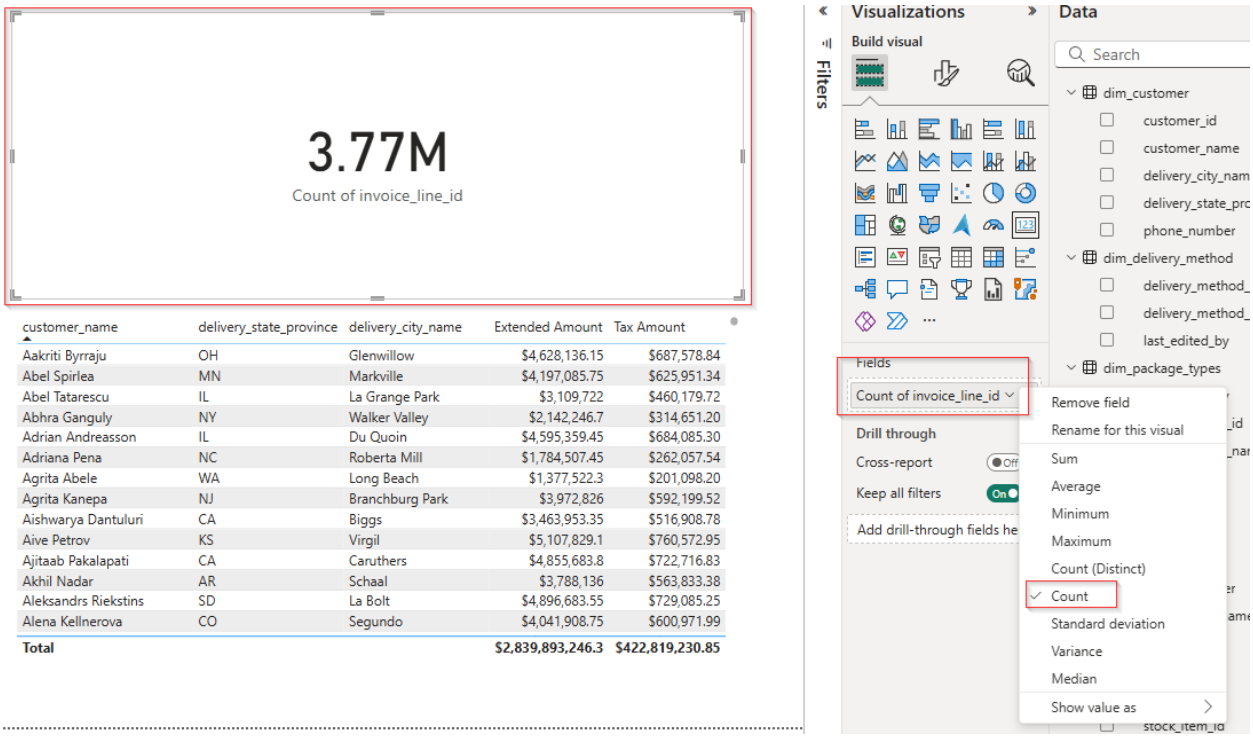
Lastly, add the two **Measures** created in the previous section, **Extended Amount** and **Tax Amount**. Once done, resize the table and move it to the bottom of the canvas.

customer_name	delivery_state_province	delivery_city_name	Extended Amount	Tax Amount
Aakriti Byrraju	OH	Glenwillow	$4,628,136.15	$687,578.84
Abel Spirlea	MN	Markville	$4,197,085.75	$625,951.34
Abel Tatarescu	IL	La Grange Park	$3,109,722	$460,179.72
Abhra Ganguly	NY	Walker Valley	$2,142,246.7	$314,651.20
Adrian Andreasson	IL	Du Quoin	$4,595,359.45	$684,085.30
Adriana Pena	NC	Roberta Mill	$1,784,507.45	$262,057.54
Agrita Abele	WA	Long Beach	$1,377,522.3	$201,098.20
Agrita Kanepa	NJ	Branchburg Park	$3,972,826	$592,199.52
Aishwarya Dantuluri	CA	Biggs	$3,463,953.35	$516,908.78
Aive Petrov	KS	Virgil	$5,107,829.1	$760,572.95
Ajitaab Pakalapati	CA	Caruthers	$4,855,683.8	$722,716.83
Akhil Nadar	AR	Schaal	$3,788,136	$563,833.38
Aleksandrs Riekstins	SD	La Bolt	$4,896,683.55	$729,085.25
Alena Kellnerova	CO	Segundo	$4,041,908.75	$600,971.99
Total			**$2,839,893,246.3**	**$422,819,230.85**

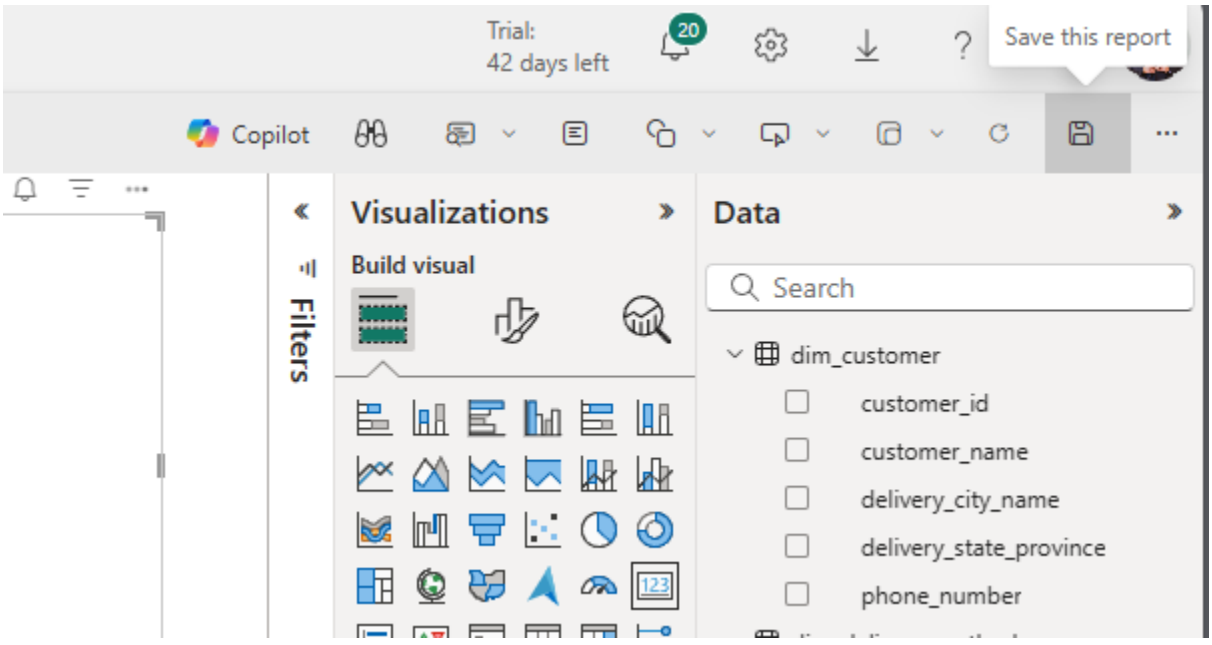
Next, create a **Clustered Column Chart** by selecting the appropriate icon from the **Visualization Blade**. From the **Data Blade**, add **dim_salesperson.salesperson_name** and the **Extended Amount** measure to the chart. Adjust the visualization and position it to the left of the canvas.

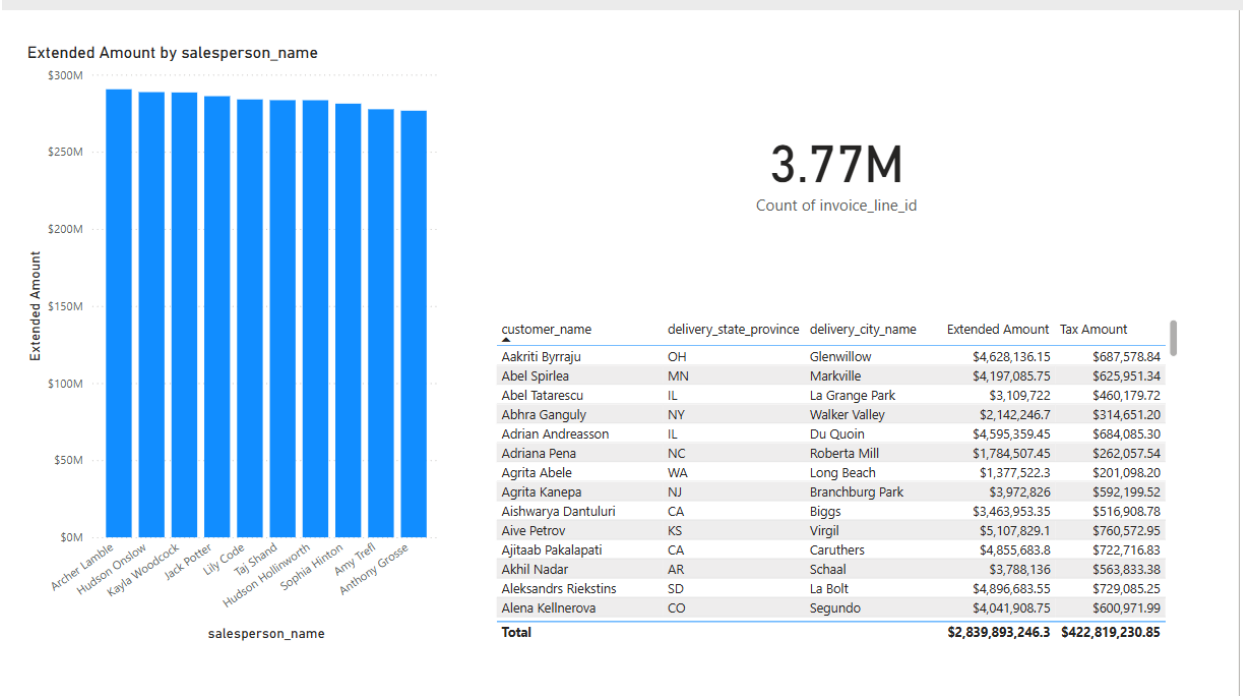


To complete the report, add a **Card Visualization** to the canvas and add the **invoice_line_id** field to it. Change the aggregation to **Count.**



Finally, click **Save** in the top-right corner to save your report. Name your report **manual_invoice_report_{your_initials}** and click **Save**.





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Aishwarya Dantuluri	CA	Biggs	$3,463,953.35	$516,908.78
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Ajitaab Pakalapati	CA	Caruthers	$4,855,683.8	$722,716.83
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Aleksandrs Riekstins	SD	La Bolt	$4,896,683.55	$729,085.25
Alena Kellnerova	CO	Segundo	$4,041,908.75	$600,971.99
Total			**$2,839,893,246.3**	**$422,819,230.85**

Part 3: Visualizing Your Data via Auto-Generated Power BI Report

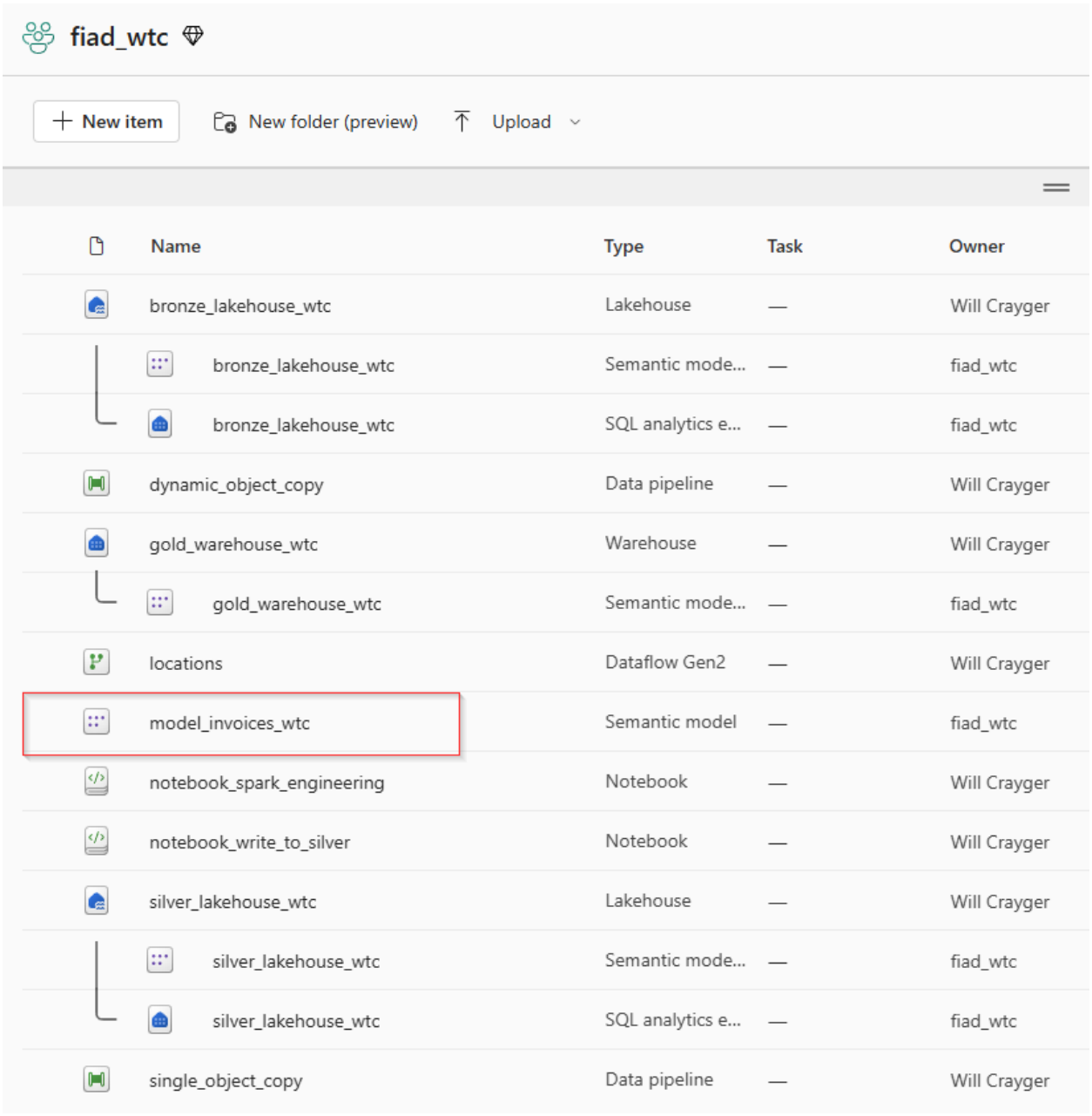
Visualizing Your Data via Auto-Generated Power BI Report: To start, navigate to the **Power BI** experience within your **Fabric Workspace** and click on the **model_invoice Semantic Model**.

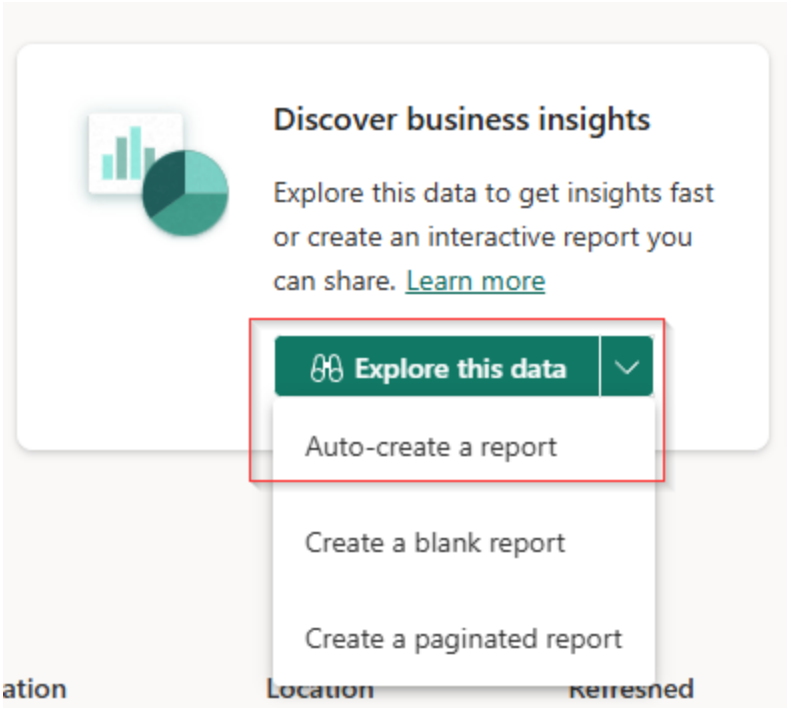
From the navigation tiles, click the dropdown for **Explore this data** and choose **Auto-create a report**. **Fabric** will automatically generate a **Power BI** report based on the data points in your semantic model.

If needed, you can further edit and tailor this report to fit specific scenarios. Otherwise, simply click **Save** from the top ribbon. Name your report **auto_created_invoice_report_{your_initials}** and click **Save**.

Finally, navigate back to your **Workspace Landing Page** to view all artifacts created during the course.

You have now successfully completed **Lab 6**.


fiad_wtc
New item
New folder (preview)
Upload
Name
Type
Task
Owner
bronze_lakehouse_wtc
Lakehouse
—
Will Crayger
bronze_lakehouse_wtc
Semantic mode...
—
fiad_wtc
bronze_lakehouse_wtc
SQL analytics e...
—
fiad_wtc
dynamic_object_copy
Data pipeline
—
Will Crayger
gold_warehouse_wtc
Warehouse
—
Will Crayger
gold_warehouse_wtc
Semantic mode...
—
fiad_wtc
locations
Dataflow Gen2
—
Will Crayger
model_invoices_wtc
Semantic model
—
fiad_wtc
notebook_spark_engineering
Notebook
—
Will Crayger
notebook_write_to_silver
Notebook
—
Will Crayger
silver_lakehouse_wtc
Lakehouse
—
Will Crayger
silver_lakehouse_wtc
Semantic mode...
—
fiad_wtc
silver_lakehouse_wtc
SQL analytics e...
—
fiad_wtc
single_object_copy
Data pipeline
—
Will Crayger


Discover business insights
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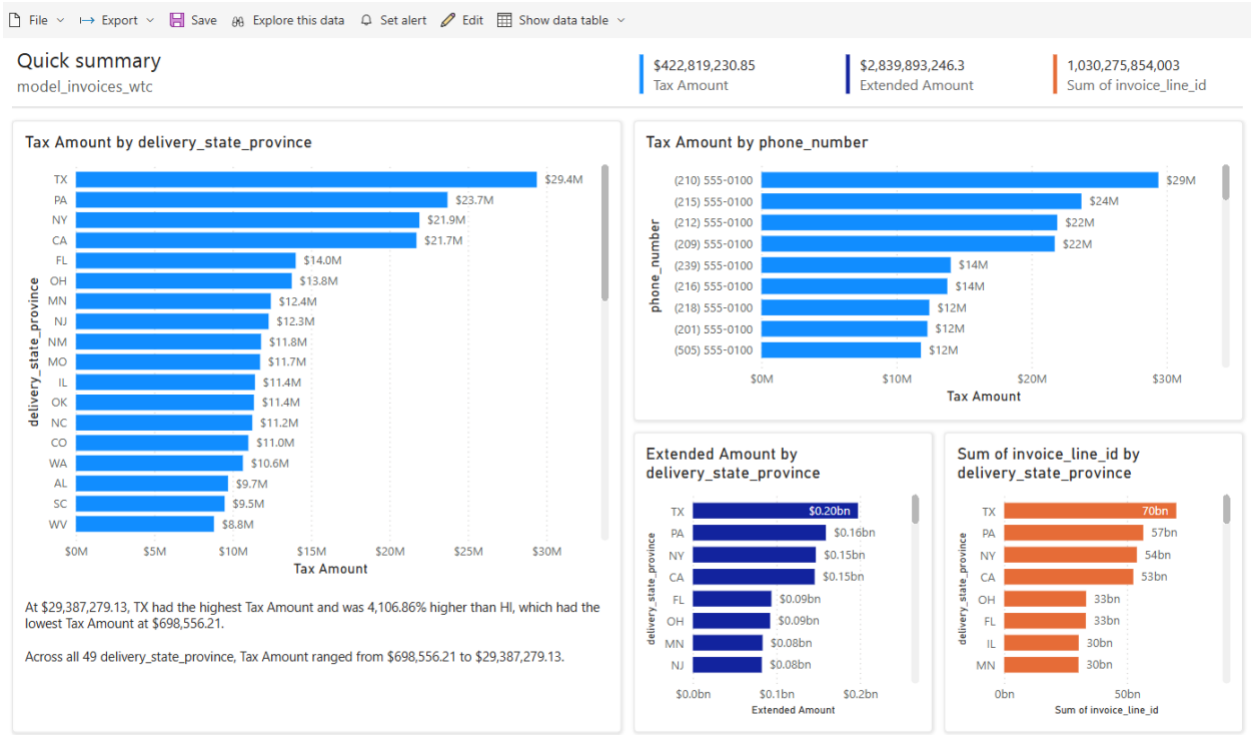
Auto-create a report
Create a blank report
Create a paginated report
ation
Location
Refreshed


File
Export
Save
Explore this data
Set alert
Edit
Show data table
Quick summary
model_invoices_wtc
$422,819,230.85
Tax Amount
$2,839,893,246.3
Extended Amount
1,030,275,854,003
Sum of invoice_line_id
Tax Amount by delivery_state_province
TX $29.4M
PA $23.7M
NY $21.9M
CA $21.7M
FL $14.0M
OH $13.8M
MN $12.4M
NJ $12.3M
NM $11.8M
MO $11.7M
IL $11.4M
OK $11.4M
NC $11.2M
CO $11.0M
WA $10.6M
AL $9.7M
SC $9.5M
WV $8.8M
delivery_state_province
$0M $5M $10M $15M $20M $25M $30M
Tax Amount
At $29,387,279.13, TX had the highest Tax Amount and was 4,106.86% higher than HI, which had the lowest Tax Amount at $698,556.21.
Across all 49 delivery_state_province, Tax Amount ranged from $698,556.21 to $29,387,279.13.
Tax Amount by phone_number
(210) 555-0100 $29M
(215) 555-0100 $24M
(212) 555-0100 $22M
(209) 555-0100 $22M
(239) 555-0100 $14M
(216) 555-0100 $14M
(218) 555-0100 $12M
(201) 555-0100 $12M
(505) 555-0100 $12M
phone_number
$0M $10M $20M $30M
Tax Amount
Extended Amount by delivery_state_province
TX $0.20bn
PA $0.16bn
NY $0.15bn
CA $0.15bn
FL $0.09bn
OH $0.09bn
MN $0.08bn
NJ $0.08bn
delivery_state_province
$0.0bn $0.1bn $0.2bn
Extended Amount
Sum of invoice_line_id by delivery_state_province
TX 70bn
PA 57bn
NY 54bn
CA 53bn
OH 33bn
FL 33bn
IL 30bn
MN 30bn
delivery_state_province
0bn 50bn
Sum of invoice_line_id