Data Science

Data Analytics
in
Business Processes

Task 2:

'You work as a business analyst for a retail company that operates both physical stores and an online platform. The company wants to improve its inventory management by creating a Power BI dashboard to track and analyze inventory levels. They have provided you with the necessary data, including product information, sales data, and current inventory counts.'

In this task you are expected to explore online platforms like kaggle for dataset. '*product information, sales data, and current inventory counts'* these are the fields (column-name can be different) that you need to look for in the dataset. To additionally support you in Task 2, I am attaching a relevant dataset-'online_sales.csv'. You can get information on *product information* from 'Description' column, *sales data* from 'Quantity' x 'UnitPrice' column *and current inventory counts* from 'Quantity' column.

Task a: Data Integration and Transformation

- Explain how you would integrate and transform the provided data sources to create a unified dataset suitable for inventory analysis in Power BI.
- Outline the key data cleansing and transformation steps you would perform.

Task b: Dashboard Design and Visualizations

- Describe the design of the Power BI dashboard, including the choice of visualizations (e.g., bar charts, line charts, tables) and their placement on the dashboard.
- Justify your selection of visualizations based on the information needs of inventory managers.
- Discuss how you would incorporate drill-through functionality to allow users to explore inventory details for specific products or locations.

Task c: Inventory Metrics and Alerts

- Identify at least three critical inventory metrics or KPIs (e.g., inventory turnover rate, days of inventory) that you would include in the dashboard.
- Explain the importance of each metric and how it would be calculated from the available data.
- Describe how you would set up conditional formatting or alerts to highlight potential inventory issues or anomalies.

Task d: User Training and Documentation

- Briefly outline your strategy for training end-users on how to use the Power BI inventory dashboard effectively.
- Discuss the importance of creating documentation or user guides to assist users in navigating and interpreting the dashboard.

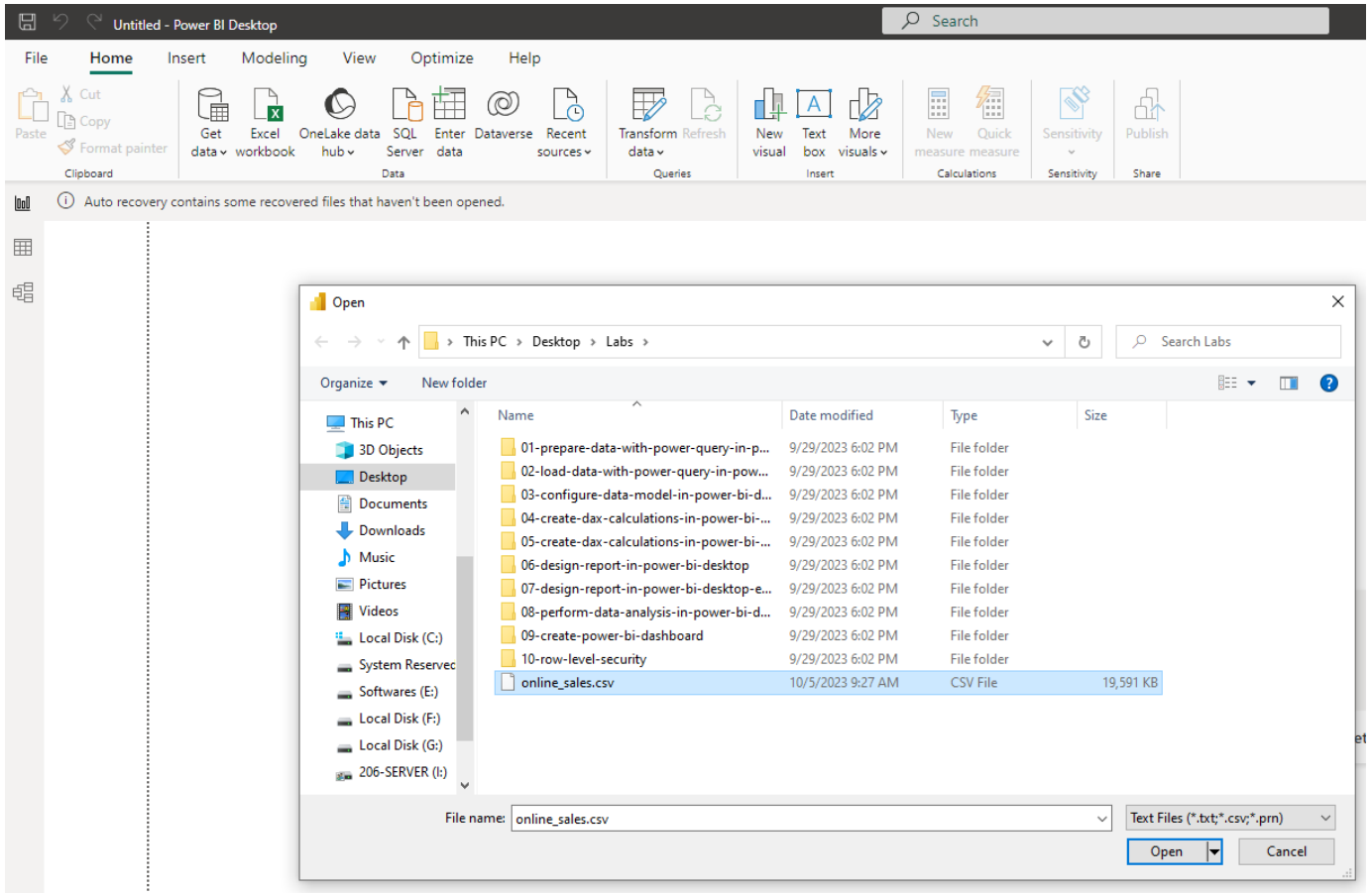
Task 2:

Task a: Data Integration and Transformation

- Explain how you would integrate and transform the provided data sources to create a unified dataset suitable for inventory analysis in Power BI.
- Outline the key data cleansing and transformation steps you would perform.

Integrating the data source, online_sales.csv :-

Once click the Get Data option from the menu pane under the Home tab, it is possible to select the .csv file (the data source) from the folder explorer window.


Untitled - Power BI Desktop
Search
File
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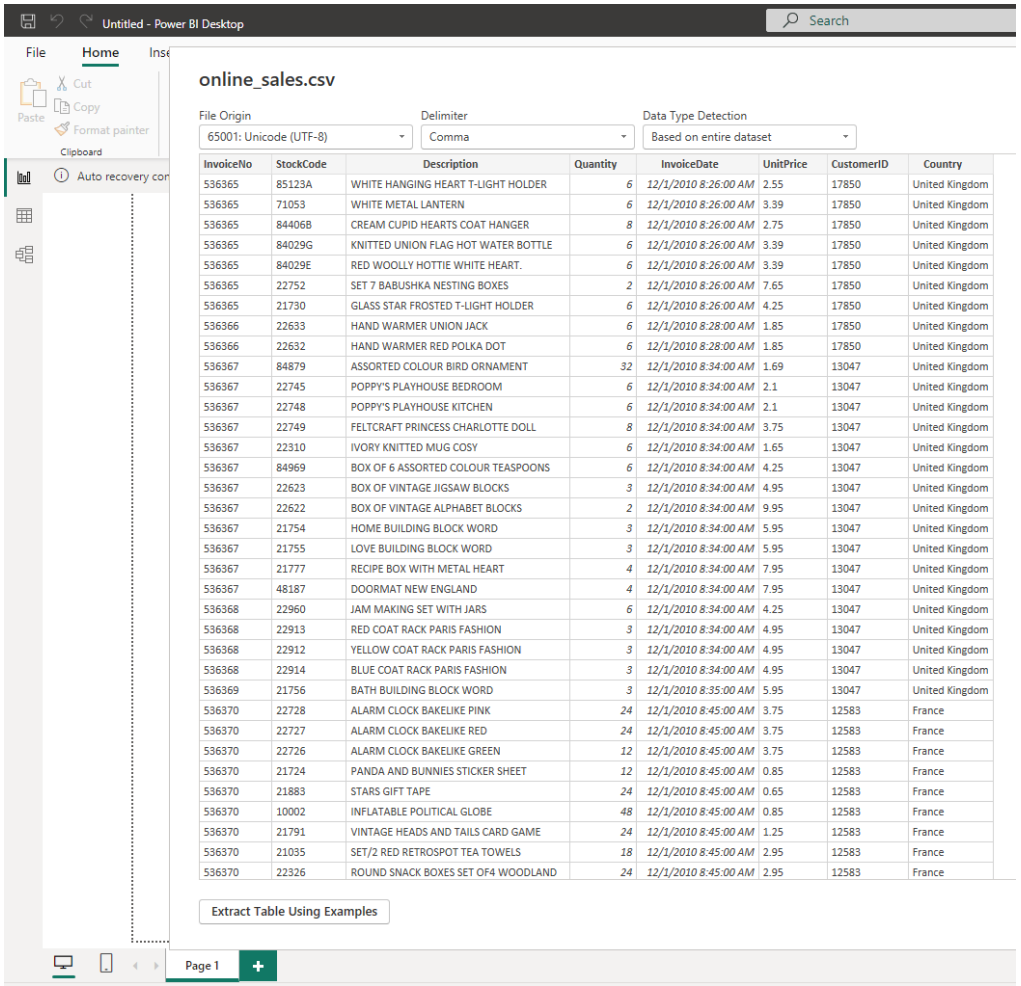
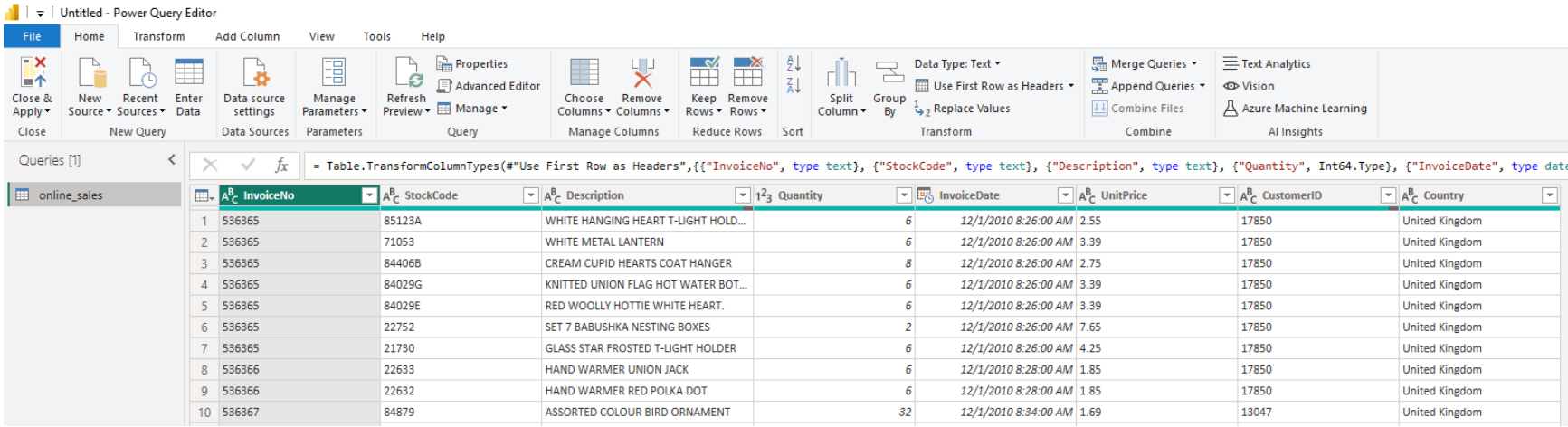
Format painter
Clipboard
Get data
Excel workbook
OneLake data hub
SQL Server
Enter data
Dataverse
Recent sources
Data
Transform data
Refresh
Queries
New visual
Text box
More visuals
Insert
New measure
Quick measure
Calculations
Sensitivity
Sensitivity
Publish
Share
Auto recovery contains some recovered files that haven't been opened.
Open
This PC
Desktop
Labs
Search Labs
Organize
New folder
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
System Reserved
Softwares (E:)
Local Disk (F:)
Local Disk (G:)
206-SERVER (I:)
Name
Date modified
Type
Size
01-prepare-data-with-power-query-in-p... 9/29/2023 6:02 PM File folder
02-load-data-with-power-query-in-pow... 9/29/2023 6:02 PM File folder
03-configure-data-model-in-power-bi-d... 9/29/2023 6:02 PM File folder
04-create-dax-calculations-in-power-bi-... 9/29/2023 6:02 PM File folder
05-create-dax-calculations-in-power-bi-... 9/29/2023 6:02 PM File folder
06-design-report-in-power-bi-desktop 9/29/2023 6:02 PM File folder
07-design-report-in-power-bi-desktop-e... 9/29/2023 6:02 PM File folder
08-perform-data-analysis-in-power-bi-d... 9/29/2023 6:02 PM File folder
09-create-power-bi-dashboard 9/29/2023 6:02 PM File folder
10-row-level-security 9/29/2023 6:02 PM File folder
online_sales.csv 10/5/2023 9:27 AM CSV File 19,591 KB
File name: online_sales.csv
Text Files (*.txt;*.csv;*.prn)
Open
Cancel

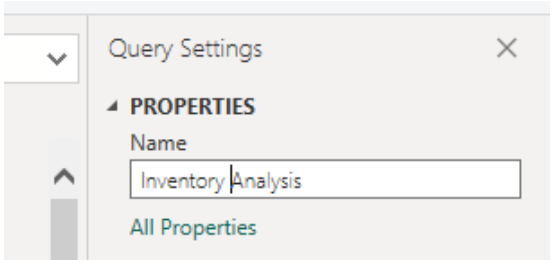


InvoiceNo	StockCode	Description	Quantity	InvoiceDate	UnitPrice	CustomerID	Country
536365	85123A	WHITE HANGING HEART T-LIGHT HOLDER	6	12/1/2010 8:26:00 AM	2.55	17850	United Kingdom
536365	71053	WHITE METAL LANTERN	6	12/1/2010 8:26:00 AM	3.39	17850	United Kingdom
536365	84406B	CREAM CUPID HEARTS COAT HANGER	8	12/1/2010 8:26:00 AM	2.75	17850	United Kingdom
536365	84029G	KNITTED UNION FLAG HOT WATER BOTTLE	6	12/1/2010 8:26:00 AM	3.39	17850	United Kingdom
536365	84029E	RED WOOLLY HOTTIE WHITE HEART.	6	12/1/2010 8:26:00 AM	3.39	17850	United Kingdom
536365	22752	SET 7 BABUSHKA NESTING BOXES	2	12/1/2010 8:26:00 AM	7.65	17850	United Kingdom
536365	21730	GLASS STAR FROSTED T-LIGHT HOLDER	6	12/1/2010 8:26:00 AM	4.25	17850	United Kingdom
536366	22633	HAND WARMER UNION JACK	6	12/1/2010 8:28:00 AM	1.85	17850	United Kingdom
536366	22632	HAND WARMER RED POLKA DOT	6	12/1/2010 8:28:00 AM	1.85	17850	United Kingdom
536367	84879	ASSORTED COLOUR BIRD ORNAMENT	32	12/1/2010 8:34:00 AM	1.69	13047	United Kingdom
536367	22745	POPPY'S PLAYHOUSE BEDROOM	6	12/1/2010 8:34:00 AM	2.1	13047	United Kingdom
536367	22748	POPPY'S PLAYHOUSE KITCHEN	6	12/1/2010 8:34:00 AM	2.1	13047	United Kingdom
536367	22749	FELTCRAFT PRINCESS CHARLOTTE DOLL	8	12/1/2010 8:34:00 AM	3.75	13047	United Kingdom
536367	22310	IVORY KNITTED MUG COSY	6	12/1/2010 8:34:00 AM	1.65	13047	United Kingdom
536367	84969	BOX OF 6 ASSORTED COLOUR TEASPOONS	6	12/1/2010 8:34:00 AM	4.25	13047	United Kingdom
536367	22623	BOX OF VINTAGE JIGSAW BLOCKS	3	12/1/2010 8:34:00 AM	4.95	13047	United Kingdom
536367	22622	BOX OF VINTAGE ALPHABET BLOCKS	2	12/1/2010 8:34:00 AM	9.95	13047	United Kingdom
536367	21754	HOME BUILDING BLOCK WORD	3	12/1/2010 8:34:00 AM	5.95	13047	United Kingdom
536367	21755	LOVE BUILDING BLOCK WORD	3	12/1/2010 8:34:00 AM	5.95	13047	United Kingdom
536367	21777	RECIPE BOX WITH METAL HEART	4	12/1/2010 8:34:00 AM	7.95	13047	United Kingdom
536367	48187	DOORMAT NEW ENGLAND	4	12/1/2010 8:34:00 AM	7.95	13047	United Kingdom
536368	22960	JAM MAKING SET WITH JARS	6	12/1/2010 8:34:00 AM	4.25	13047	United Kingdom
536368	22913	RED COAT RACK PARIS FASHION	3	12/1/2010 8:34:00 AM	4.95	13047	United Kingdom
536368	22912	YELLOW COAT RACK PARIS FASHION	3	12/1/2010 8:34:00 AM	4.95	13047	United Kingdom
536368	22914	BLUE COAT RACK PARIS FASHION	3	12/1/2010 8:34:00 AM	4.95	13047	United Kingdom
536369	21756	BATH BUILDING BLOCK WORD	3	12/1/2010 8:35:00 AM	5.95	13047	United Kingdom
536370	22728	ALARM CLOCK BAKELIKE PINK	24	12/1/2010 8:45:00 AM	3.75	12583	France
536370	22727	ALARM CLOCK BAKELIKE RED	24	12/1/2010 8:45:00 AM	3.75	12583	France
536370	22726	ALARM CLOCK BAKELIKE GREEN	12	12/1/2010 8:45:00 AM	3.75	12583	France
536370	21724	PANDA AND BUNNIES STICKER SHEET	12	12/1/2010 8:45:00 AM	0.85	12583	France
536370	21883	STARS GIFT TAPE	24	12/1/2010 8:45:00 AM	0.65	12583	France
536370	10002	INFLATABLE POLITICAL GLOBE	48	12/1/2010 8:45:00 AM	0.85	12583	France
536370	21791	VINTAGE HEADS AND TAILS CARD GAME	24	12/1/2010 8:45:00 AM	1.25	12583	France
536370	21035	SET/2 RED RETROSPOT TEA TOWELS	18	12/1/2010 8:45:00 AM	2.95	12583	France
536370	22326	ROUND SNACK BOXES SET OF4 WOODLAND	24	12/1/2010 8:45:00 AM	2.95	12583	France

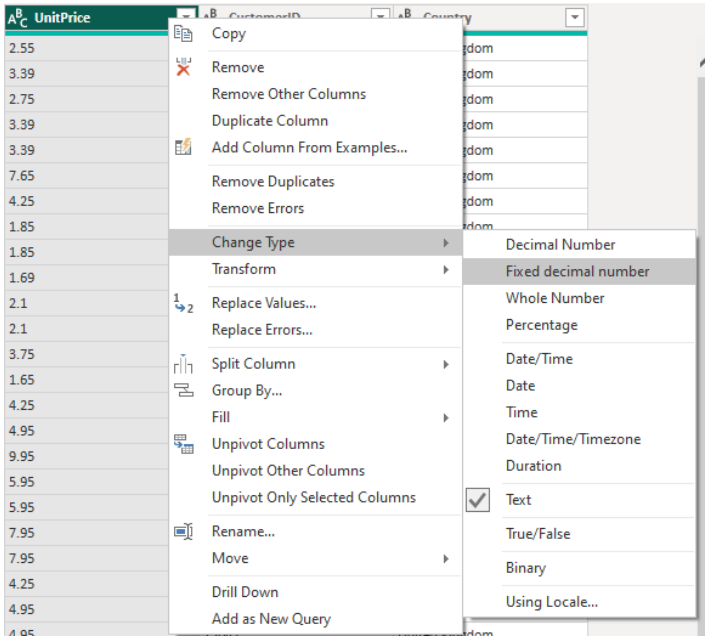
The below Power Query Editor will open once click the Transform Data button.



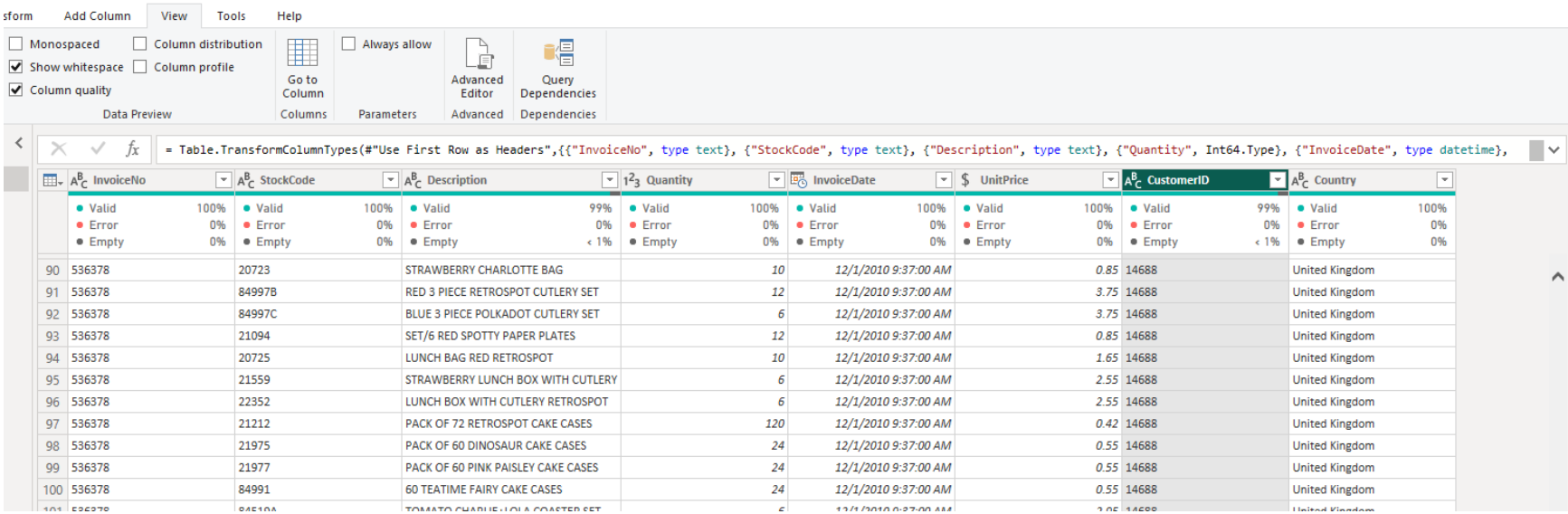
Changing the name of the query: Under the power query settings, Properties, it is allowed to provide a new name and the same name will pick at the time of loading the data to Power BI.



Formatting column’s types: Automatically the unit price column’s type has come as text hence need to be changed to fixed decimal numbers.

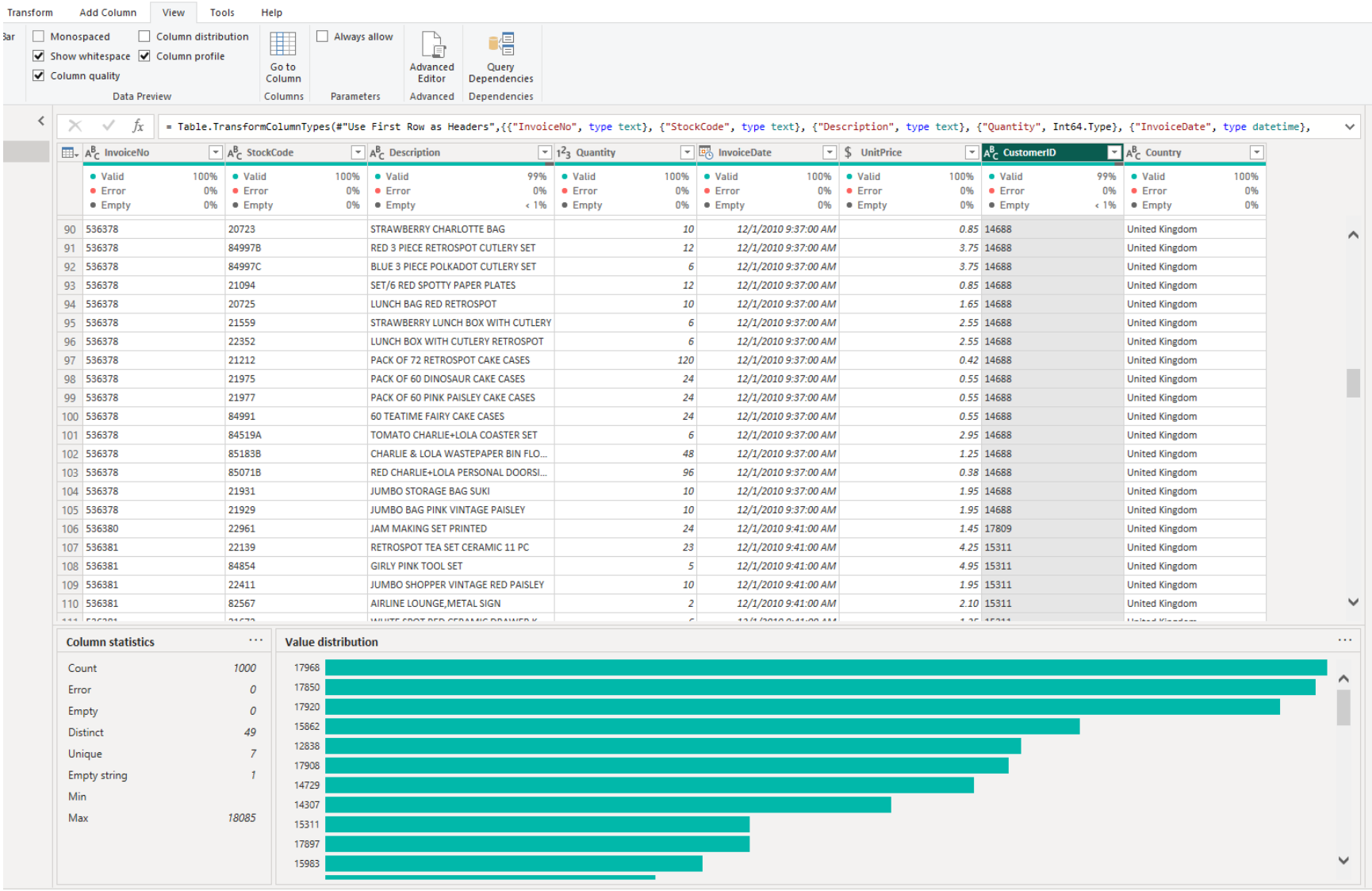


By using the Column Quality option under the view tab, it is possible to check the quality of each column.

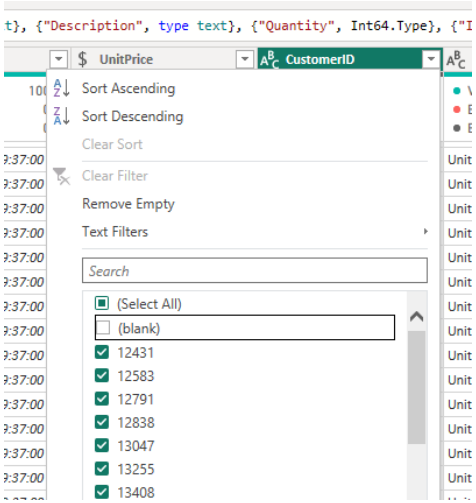


	InvoiceNo	StockCode	Description	Quantity	InvoiceDate	UnitPrice	CustomerID	Country
90	536378	20723	STRAWBERRY CHARLOTTE BAG	10	12/1/2010 9:37:00 AM	0.85	14688	United Kingdom
91	536378	84997B	RED 3 PIECE RETROSPOT CUTLERY SET	12	12/1/2010 9:37:00 AM	3.75	14688	United Kingdom
92	536378	84997C	BLUE 3 PIECE POLKADOT CUTLERY SET	6	12/1/2010 9:37:00 AM	3.75	14688	United Kingdom
93	536378	21094	SET/6 RED SPOTTY PAPER PLATES	12	12/1/2010 9:37:00 AM	0.85	14688	United Kingdom
94	536378	20725	LUNCH BAG RED RETROSPOT	10	12/1/2010 9:37:00 AM	1.65	14688	United Kingdom
95	536378	21559	STRAWBERRY LUNCH BOX WITH CUTLERY	6	12/1/2010 9:37:00 AM	2.55	14688	United Kingdom
96	536378	22352	LUNCH BOX WITH CUTLERY RETROSPOT	6	12/1/2010 9:37:00 AM	2.55	14688	United Kingdom
97	536378	21212	PACK OF 72 RETROSPOT CAKE CASES	120	12/1/2010 9:37:00 AM	0.42	14688	United Kingdom
98	536378	21975	PACK OF 60 DINOSAUR CAKE CASES	24	12/1/2010 9:37:00 AM	0.55	14688	United Kingdom
99	536378	21977	PACK OF 60 PINK PAISLEY CAKE CASES	24	12/1/2010 9:37:00 AM	0.55	14688	United Kingdom
100	536378	84991	60 TEATIME FAIRY CAKE CASES	24	12/1/2010 9:37:00 AM	0.55	14688	United Kingdom

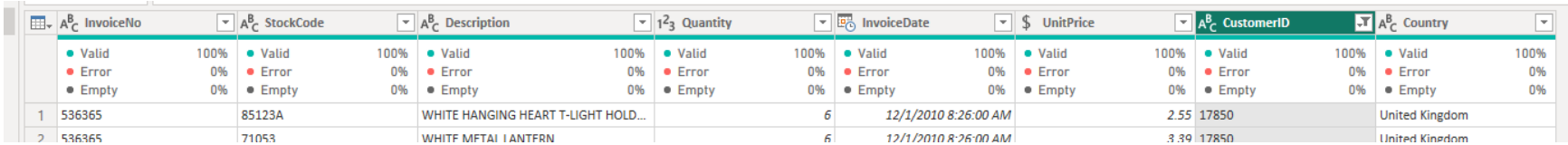
Similarly, the Column Profile option shows the statistics of a selected column.



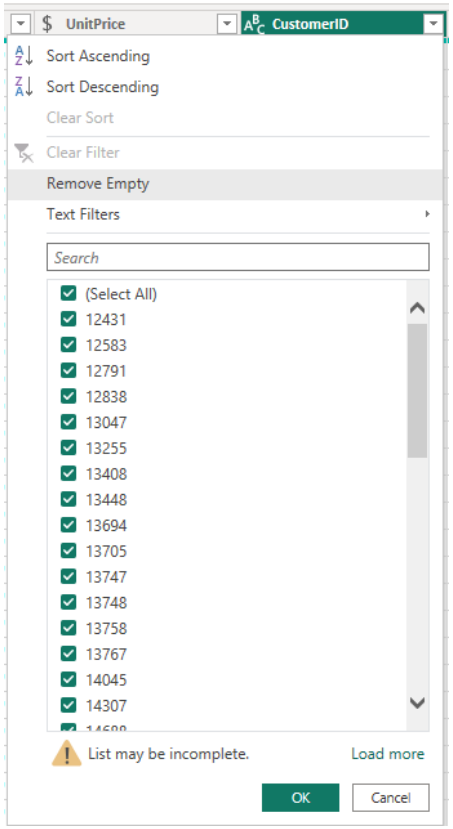
It is always better to remove empty strings or blank cells from the dataset and this can be accomplished by unticking the (blank) option from the selected column.



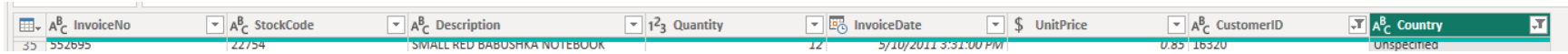
After removing all the empty strings, the Validity can be seen as 100% for each column.



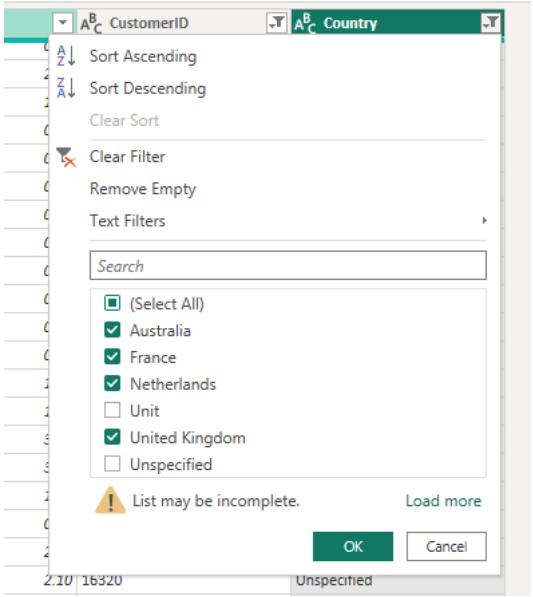
Similarly, the Remove Empty option can be used.



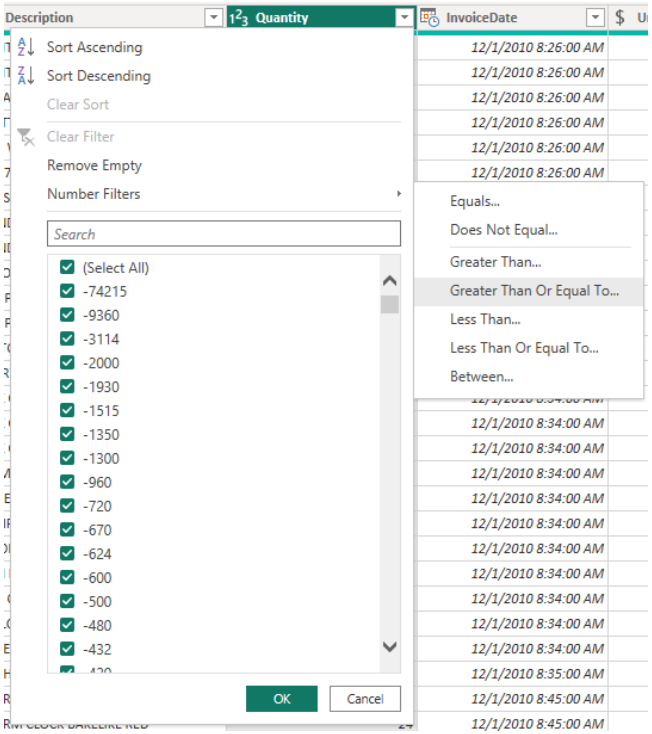
There are no spaces words of all the columns otherwise, it is recommended that replace the space with an (_) underscore.



It is a good practice to remove unwanted or unspecified data line items from the dataset to produce high accurate results.



Since the source file contains inventory data, in order to have more clarity on end results, it is possible to assume that the inventory quantity should be equal to or greater than zero. Using the filter function, this condition can be applied to the Quantity column.



The data can be loaded to Power BI once the aforementioned procedures for cleansing and transformation have been used.

Task b: Dashboard Design and Visualizations

- Describe the design of the Power BI dashboard, including the choice of visualizations (e.g., bar charts, line charts, tables) and their placement on the dashboard.
- Justify your selection of visualizations based on the information needs of inventory managers.
- Discuss how you would incorporate drill-through functionality to allow users to explore inventory details for specific products or locations.

Data source: dabp_salesdata.csv

The Power BI service allows users to create Power BI dashboards, which are a collection of report elements. Depending on the situation, the dashboard visualizations could be taken from a single core dataset or a number of separate datasets. Sometimes a dashboard will include both on-premises and cloud data. A dashboard can also provide important highlights from one or more data sources.

A dashboard design has multiple tiles pinned on it. Linked to one or more data sources, such as SAP HANA, Microsoft Excel, and MS SQL Server database tables, tiles are discrete report elements or snapshots of the data. By pinning visuals from a report, you can either construct a brand-new dashboard or update an existing one. Common elements of a Power BI dashboard design include the dashboard theme, the company logo, KPIs, gauges, scorecards, live report pages, streaming data tiles, clustered bar charts, pie charts, scatter charts, alerts, Q&A feature, rapid insights, metrics, maps, legends, etc. Moreover, the user can download new elements from the Microsoft official web repository when required.

It is possible to arrange the visuals on a dashboard's canvas in ways. This includes scaling them, changing titles and subtitles, moving tiles around and adjusting the pointing of a tile (by default each tile is linked to its source).

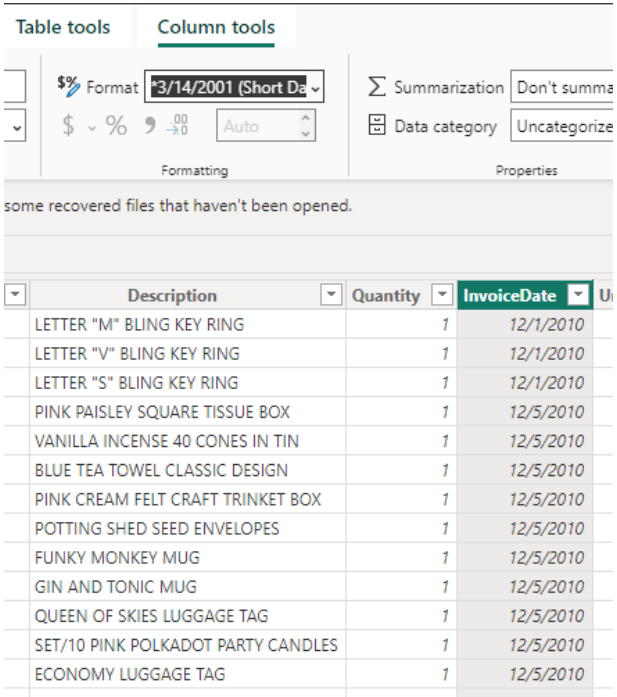
Inventory managers often find it valuable to have access to the following data displayed on a Power BI dashboard.

- Current stock value
- current stock quantity by item group
- warehouse-wise quantity and value
- the top ten fastest-moving items
- Month-by-month stock movement
- Revenue vs. gross profit

- Stock turnover during the previous 12 months
- Stock turnover by item group
- Stock counting
- Current month’s inbound and outgoing stock values

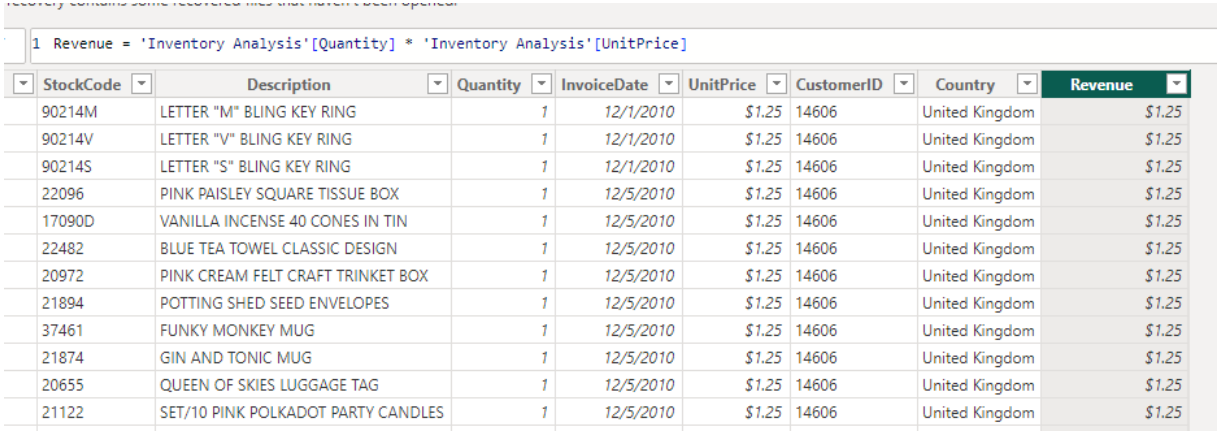
Placing a Card on the Power BI canvas that shows the Total Revenue: -

The InvoiceDate column can be formatted as follows to make it easier to generate visualizations.



Description	Quantity	InvoiceDate
LETTER "M" BLING KEY RING	1	12/1/2010
LETTER "V" BLING KEY RING	1	12/1/2010
LETTER "S" BLING KEY RING	1	12/1/2010
PINK PAISLEY SQUARE TISSUE BOX	1	12/5/2010
VANILLA INCENSE 40 CONES IN TIN	1	12/5/2010
BLUE TEA TOWEL CLASSIC DESIGN	1	12/5/2010
PINK CREAM FELT CRAFT TRINKET BOX	1	12/5/2010
POTTING SHED SEED ENVELOPES	1	12/5/2010
FUNKY MONKEY MUG	1	12/5/2010
GIN AND TONIC MUG	1	12/5/2010
QUEEN OF SKIES LUGGAGE TAG	1	12/5/2010
SET/10 PINK POLKADOT PARTY CANDLES	1	12/5/2010
ECONOMY LUGGAGE TAG	1	12/5/2010

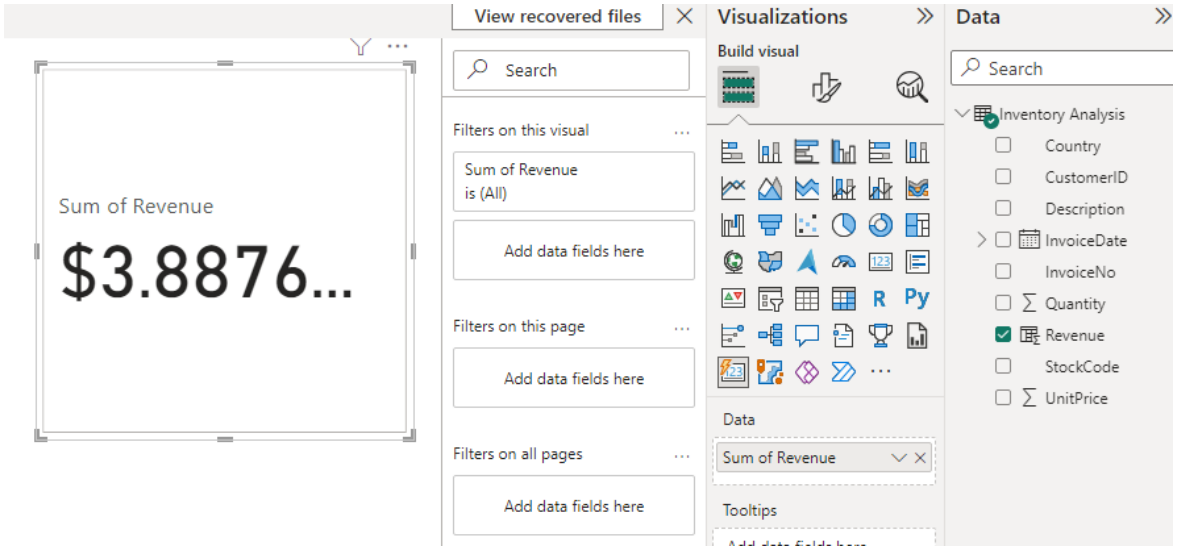
The new column, revenue, can be used to generate visual (card) on the Power BI dashboard.



```
1 Revenue = 'Inventory Analysis'[Quantity] * 'Inventory Analysis'[UnitPrice]
```

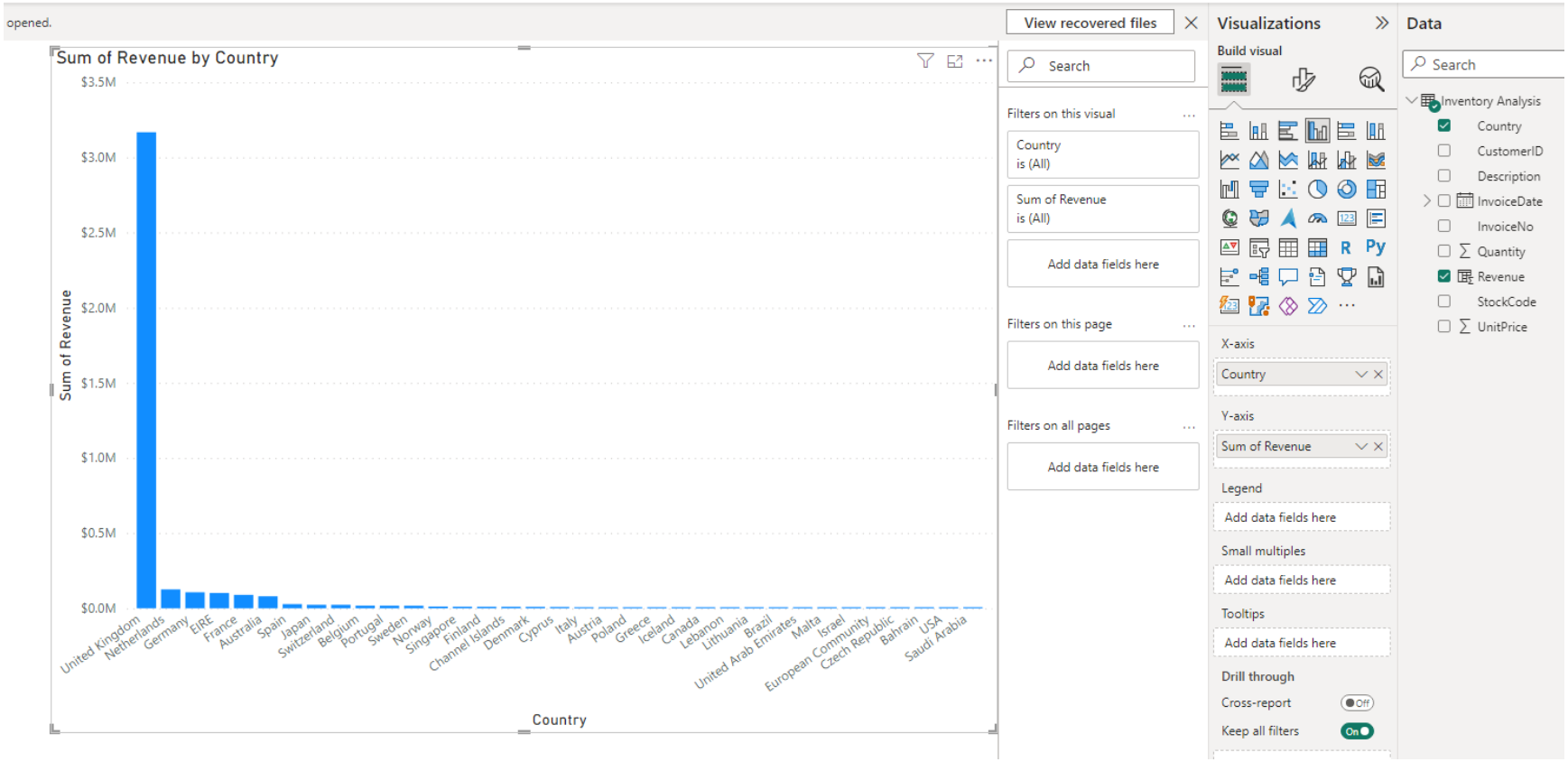
StockCode	Description	Quantity	InvoiceDate	UnitPrice	CustomerID	Country	Revenue
90214M	LETTER "M" BLING KEY RING	1	12/1/2010	$1.25	14606	United Kingdom	$1.25
90214V	LETTER "V" BLING KEY RING	1	12/1/2010	$1.25	14606	United Kingdom	$1.25
90214S	LETTER "S" BLING KEY RING	1	12/1/2010	$1.25	14606	United Kingdom	$1.25
22096	PINK PAISLEY SQUARE TISSUE BOX	1	12/5/2010	$1.25	14606	United Kingdom	$1.25
17090D	VANILLA INCENSE 40 CONES IN TIN	1	12/5/2010	$1.25	14606	United Kingdom	$1.25
22482	BLUE TEA TOWEL CLASSIC DESIGN	1	12/5/2010	$1.25	14606	United Kingdom	$1.25
20972	PINK CREAM FELT CRAFT TRINKET BOX	1	12/5/2010	$1.25	14606	United Kingdom	$1.25
21894	POTTING SHED SEED ENVELOPES	1	12/5/2010	$1.25	14606	United Kingdom	$1.25
37461	FUNKY MONKEY MUG	1	12/5/2010	$1.25	14606	United Kingdom	$1.25
21874	GIN AND TONIC MUG	1	12/5/2010	$1.25	14606	United Kingdom	$1.25
20655	QUEEN OF SKIES LUGGAGE TAG	1	12/5/2010	$1.25	14606	United Kingdom	$1.25
21122	SET/10 PINK POLKADOT PARTY CANDLES	1	12/5/2010	$1.25	14606	United Kingdom	$1.25

The card visuals shows the total revenue amount as $ 3.8876 M

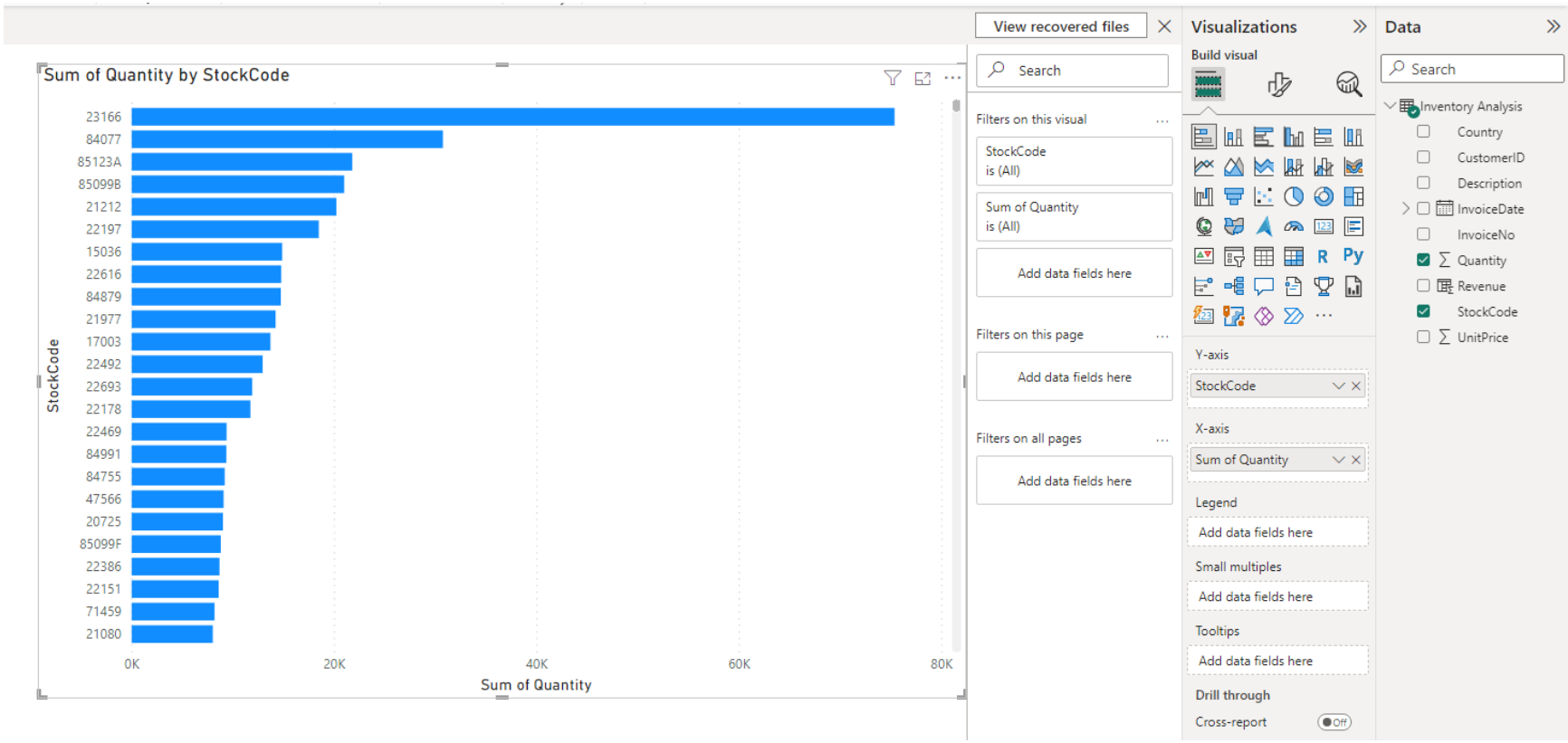


Clustered bar chart: -

The Total Revenue by Country can be shown in a clustered bar chart. According to the visual below, the United Kingdom has thus generated the most money.

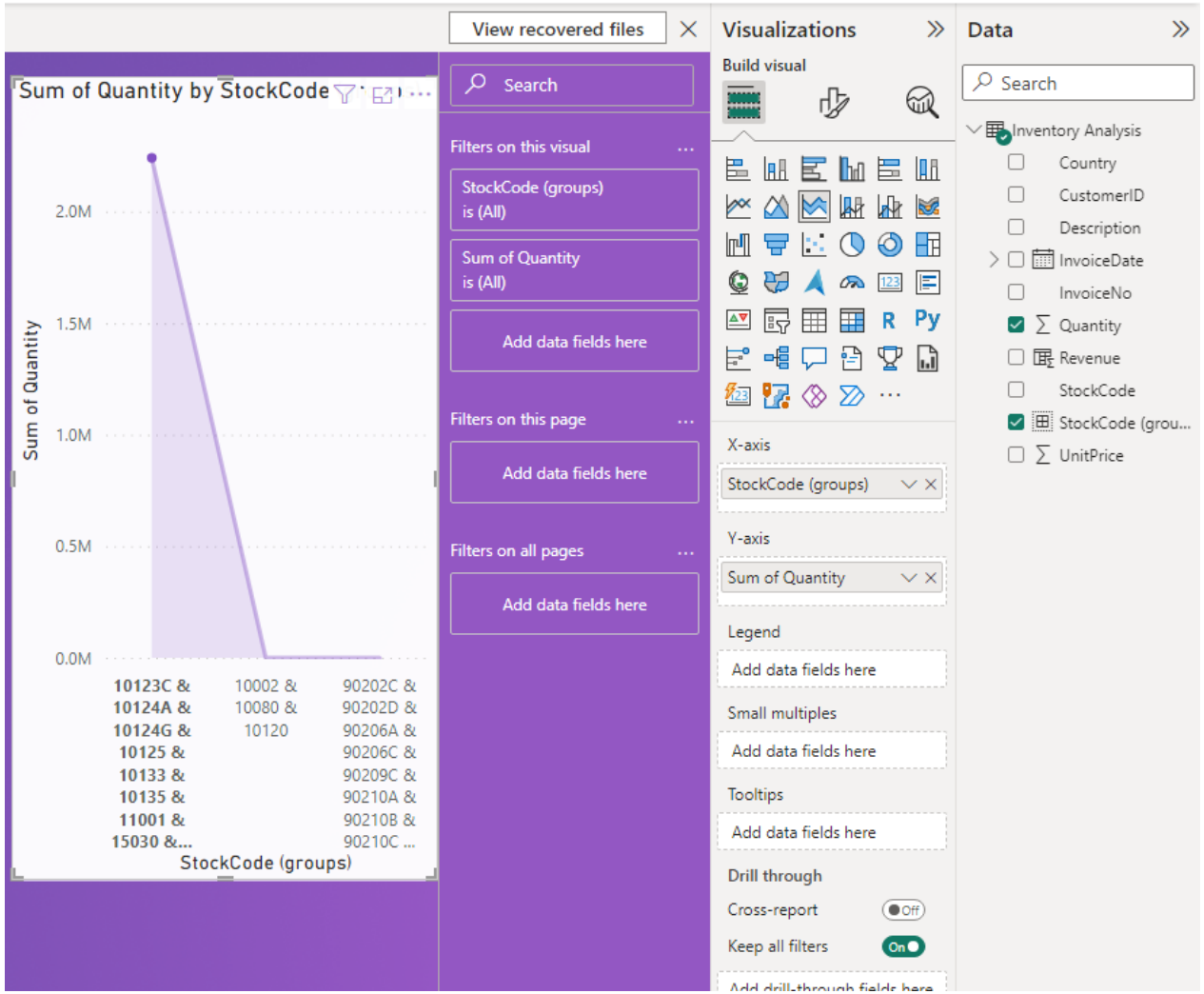


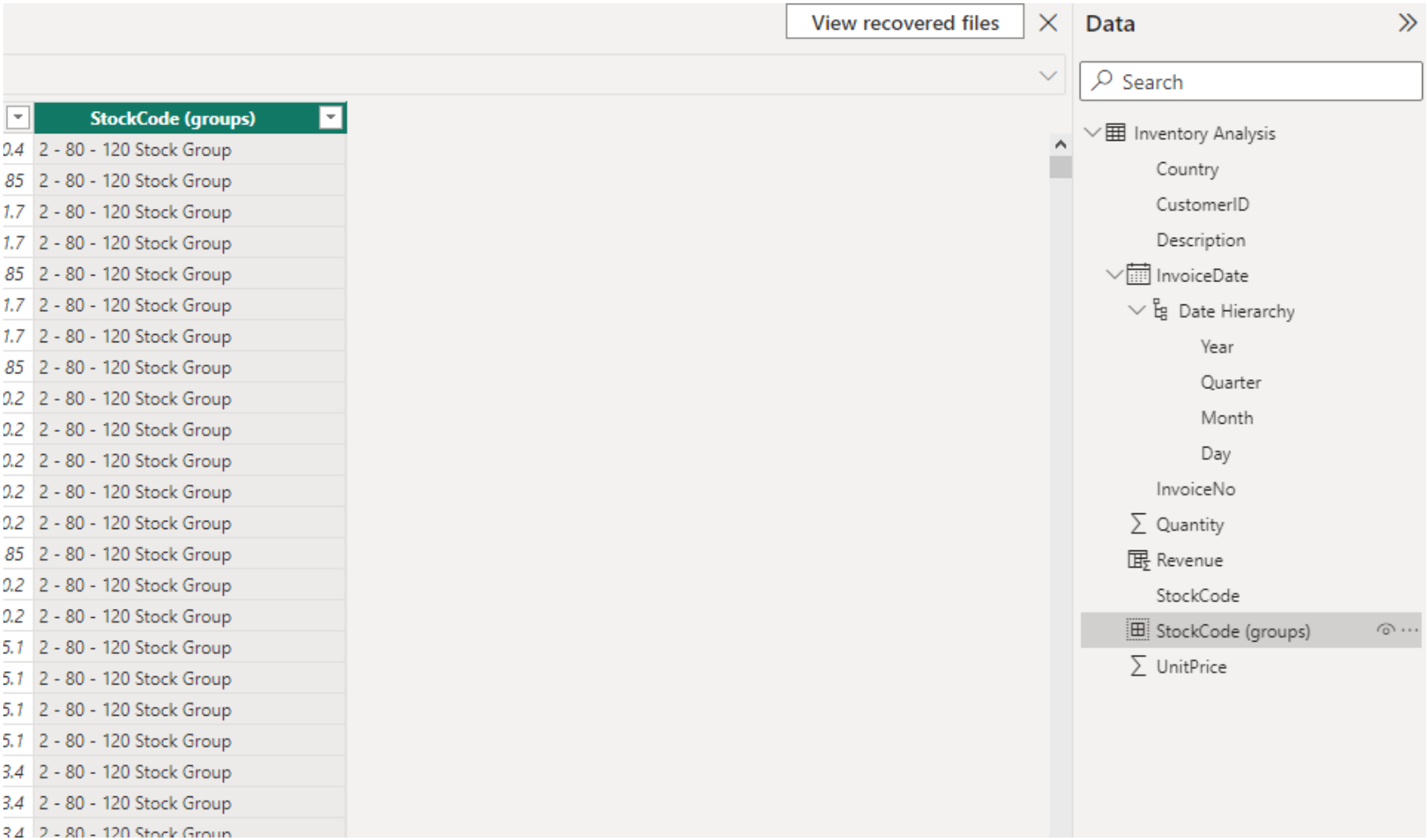
The item code 23166 has an extremely high stock quantity as compared to other goods, as can be seen from the bar chart below that shows the total quantity vs. item code.



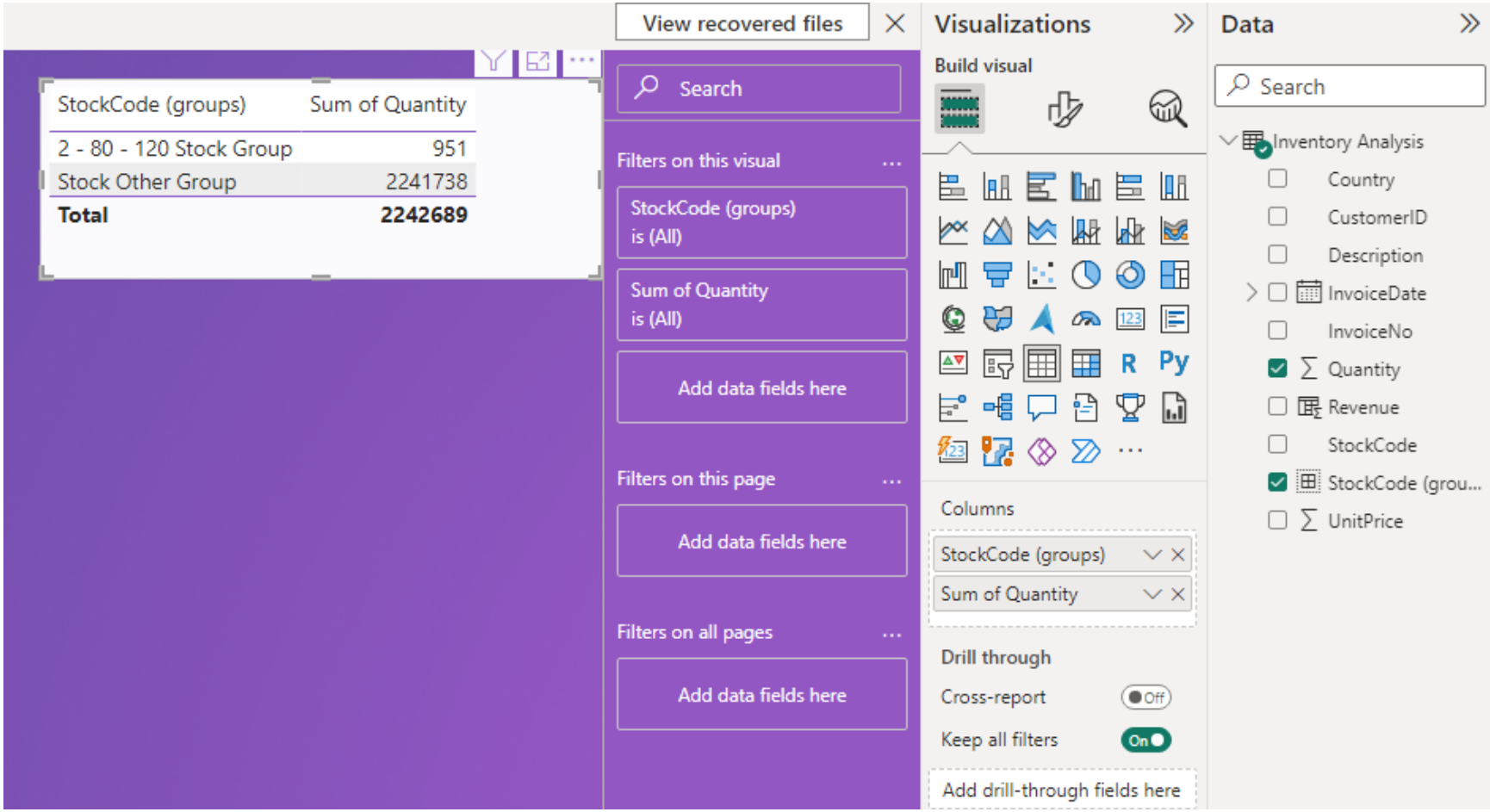
Grouping Option

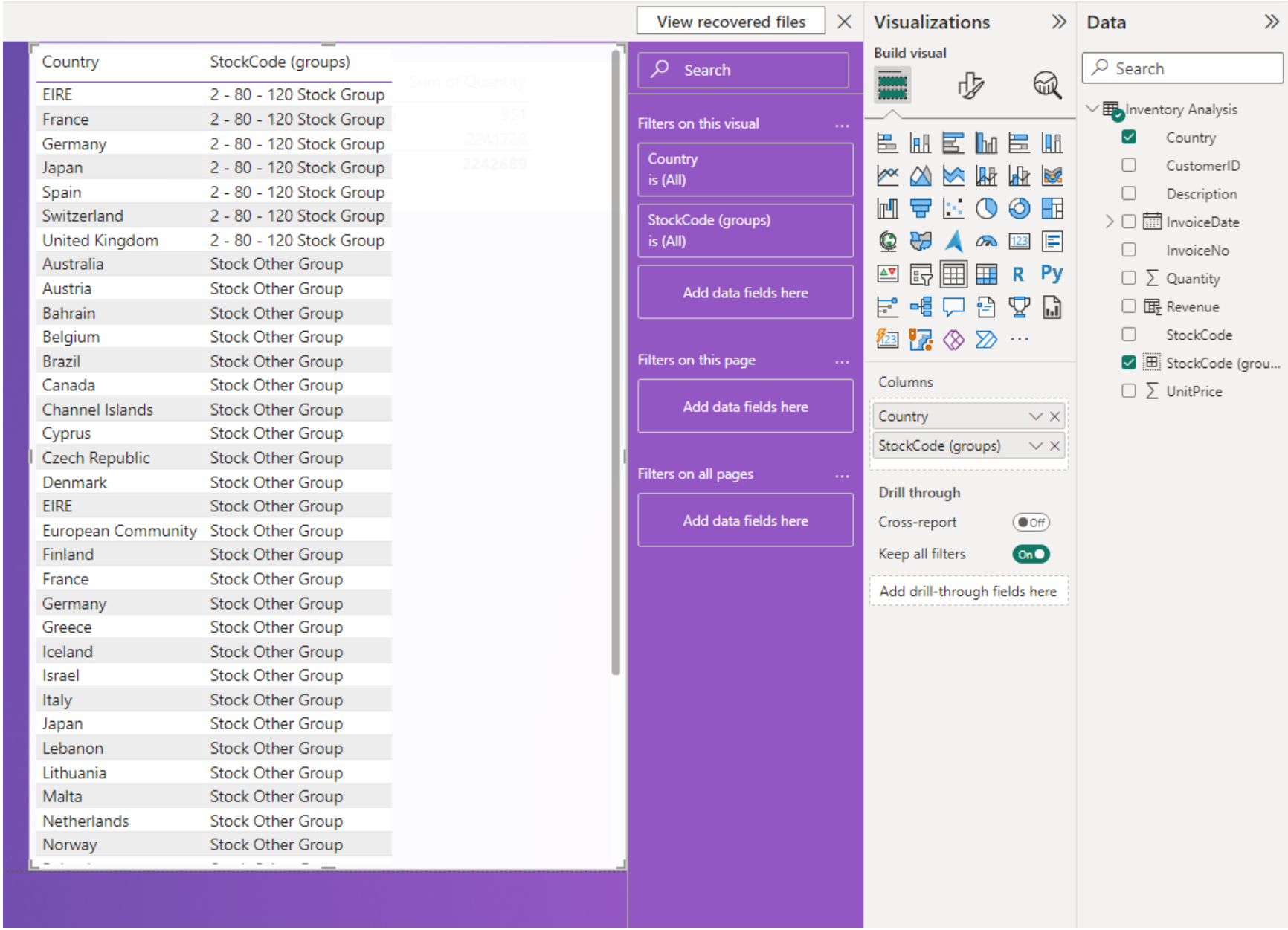
Alternatively, with Power BI, creating categories and visualizing data is also possible. For example, we divided all the products into two groups. Generated an area chart that compares the quantity between these two groupings (these 2 groups and contents have been randomly selected and generated just to showcase the grouping feature in Power BI).


View recovered files
Sum of Quantity by StockCode
2.0M
1.5M
1.0M
0.5M
0.0M
Sum of Quantity
10123C &
10124A &
10124G &
10125 &
10133 &
10135 &
11001 &
15030 &...
10002 &
10080 &
10120
90202C &
90202D &
90206A &
90206C &
90209C &
90210A &
90210B &
90210C ...
StockCode (groups)
Search
Filters on this visual
StockCode (groups) is (All)
Sum of Quantity is (All)
Add data fields here
Filters on this page
Add data fields here
Filters on all pages
Add data fields here
Visualizations
Build visual
X-axis
StockCode (groups)
Y-axis
Sum of Quantity
Legend
Add data fields here
Small multiples
Add data fields here
Tooltips
Add data fields here
Drill through
Cross-report
Off
Keep all filters
On
Data
Search
Inventory Analysis
Country
CustomerID
Description
InvoiceDate
InvoiceNo
Quantity
Revenue
StockCode
StockCode (grou...
UnitPrice


View recovered files
Data
Search
StockCode (groups)
0.4 2 - 80 - 120 Stock Group
85 2 - 80 - 120 Stock Group
1.7 2 - 80 - 120 Stock Group
1.7 2 - 80 - 120 Stock Group
85 2 - 80 - 120 Stock Group
1.7 2 - 80 - 120 Stock Group
1.7 2 - 80 - 120 Stock Group
85 2 - 80 - 120 Stock Group
0.2 2 - 80 - 120 Stock Group
0.2 2 - 80 - 120 Stock Group
0.2 2 - 80 - 120 Stock Group
0.2 2 - 80 - 120 Stock Group
0.2 2 - 80 - 120 Stock Group
85 2 - 80 - 120 Stock Group
0.2 2 - 80 - 120 Stock Group
0.2 2 - 80 - 120 Stock Group
5.1 2 - 80 - 120 Stock Group
5.1 2 - 80 - 120 Stock Group
5.1 2 - 80 - 120 Stock Group
5.1 2 - 80 - 120 Stock Group
3.4 2 - 80 - 120 Stock Group
3.4 2 - 80 - 120 Stock Group
3.4 2 - 80 - 120 Stock Group
Inventory Analysis
Country
CustomerID
Description
InvoiceDate
Date Hierarchy
Year
Quarter
Month
Day
InvoiceNo
Quantity
Revenue
StockCode
StockCode (groups)
UnitPrice

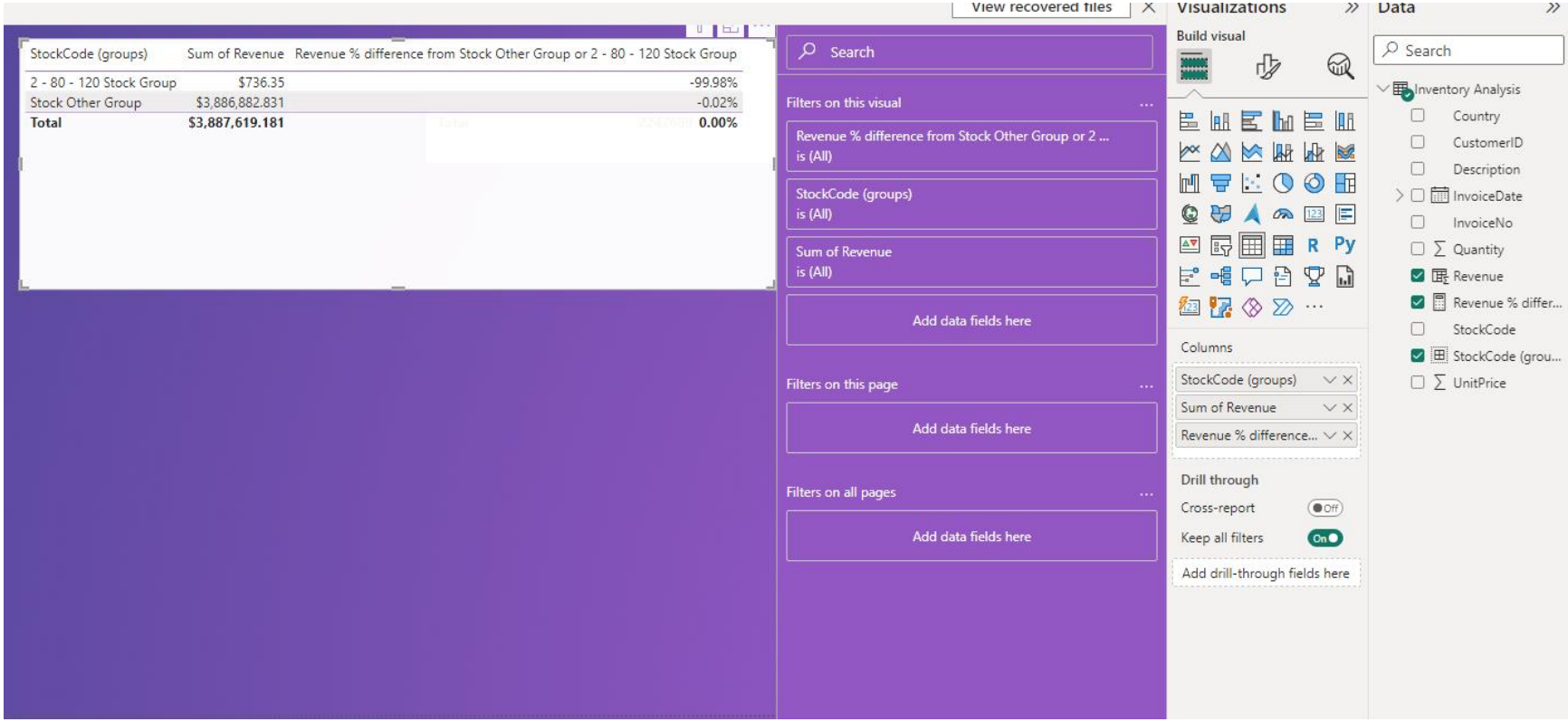
Additionally, the table below displays the total quantity by the (custom made) two groupings of items.



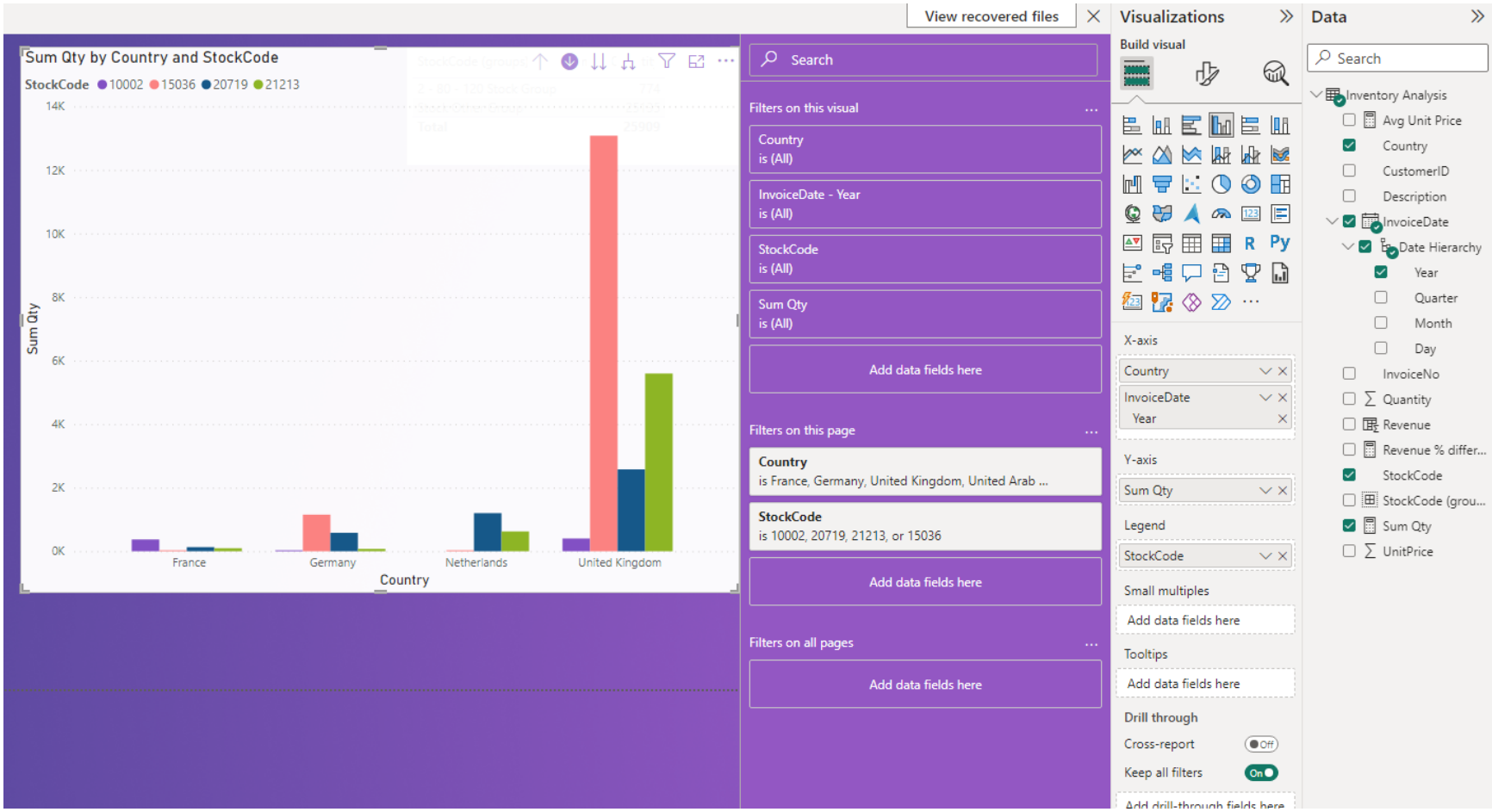


Country	StockCode (groups)
EIRE	2 - 80 - 120 Stock Group
France	2 - 80 - 120 Stock Group
Germany	2 - 80 - 120 Stock Group
Japan	2 - 80 - 120 Stock Group
Spain	2 - 80 - 120 Stock Group
Switzerland	2 - 80 - 120 Stock Group
United Kingdom	2 - 80 - 120 Stock Group
Australia	Stock Other Group
Austria	Stock Other Group
Bahrain	Stock Other Group
Belgium	Stock Other Group
Brazil	Stock Other Group
Canada	Stock Other Group
Channel Islands	Stock Other Group
Cyprus	Stock Other Group
Czech Republic	Stock Other Group
Denmark	Stock Other Group
EIRE	Stock Other Group
European Community	Stock Other Group
Finland	Stock Other Group
France	Stock Other Group
Germany	Stock Other Group
Greece	Stock Other Group
Iceland	Stock Other Group
Israel	Stock Other Group
Italy	Stock Other Group
Japan	Stock Other Group
Lebanon	Stock Other Group
Lithuania	Stock Other Group
Malta	Stock Other Group
Netherlands	Stock Other Group
Norway	Stock Other Group

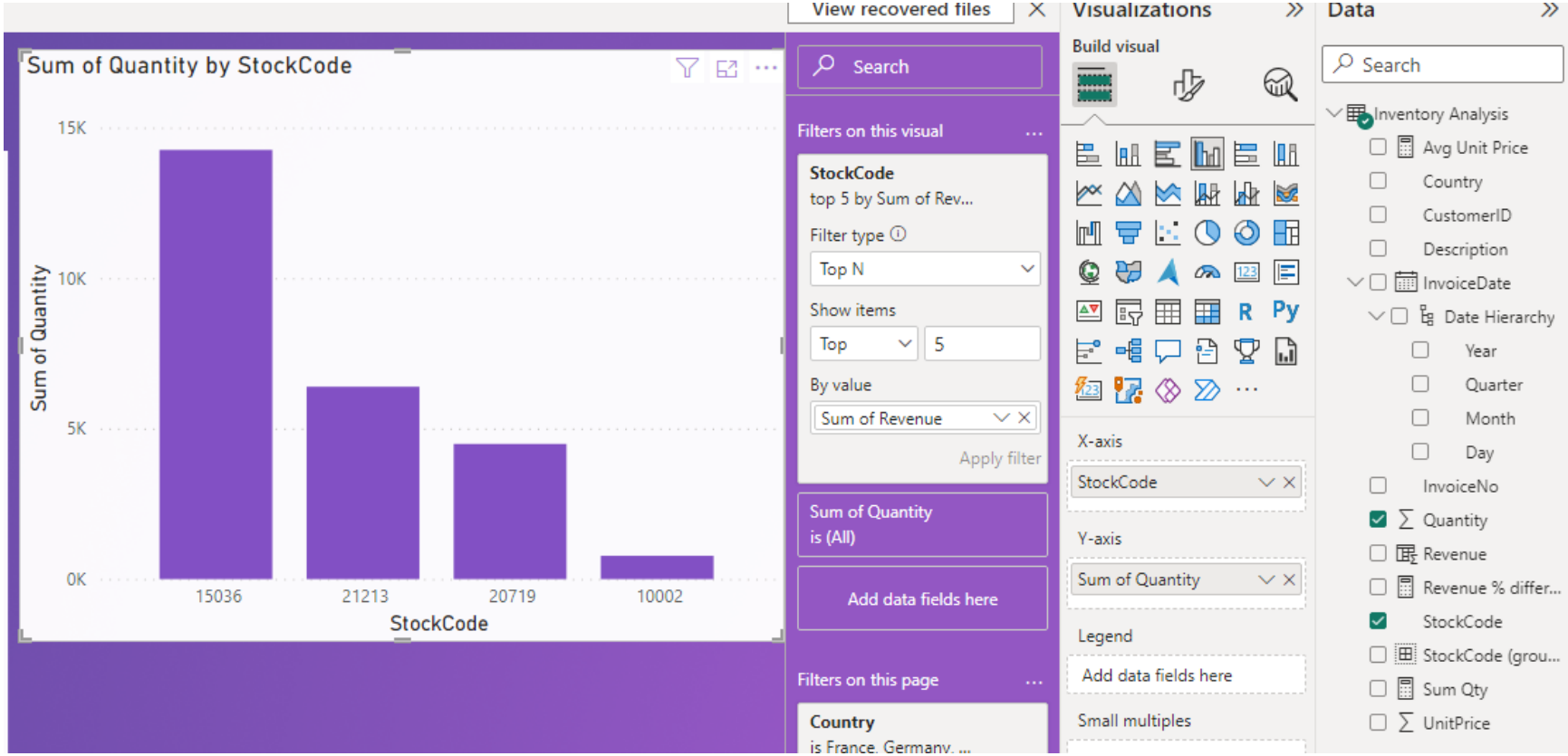
Likewise, the data table below was created using a measure to determine the total income by the two randomly made item groups.



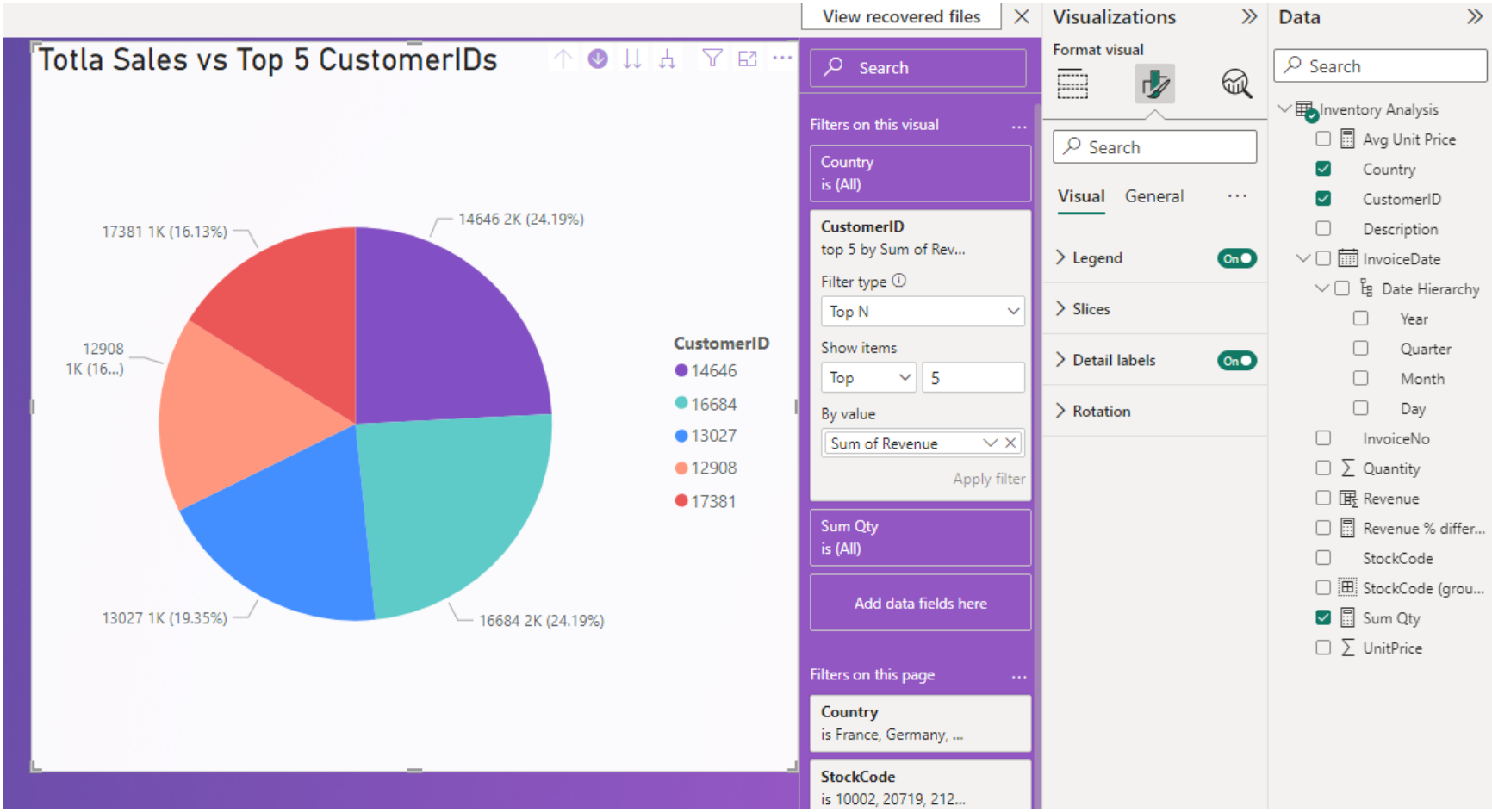
Another clustered bar chart with the location added was created to show the total quantity by location for a set of 4 stock codes. Further, it is possible to examine the overall quantity by year by drilling down.


View recovered files
Sum Qty by Country and StockCode
StockCode 10002 15036 20719 21213
14K
12K
10K
8K
6K
4K
2K
0K
Sum Qty
France
Germany
Netherlands
United Kingdom
Country
Search
Filters on this visual
Country
is (All)
InvoiceDate - Year
is (All)
StockCode
is (All)
Sum Qty
is (All)
Add data fields here
Filters on this page
Country
is France, Germany, United Kingdom, United Arab ...
StockCode
is 10002, 20719, 21213, or 15036
Add data fields here
Filters on all pages
Add data fields here
Visualizations
Build visual
X-axis
Country
InvoiceDate
Year
Y-axis
Sum Qty
Legend
StockCode
Small multiples
Add data fields here
Tooltips
Add data fields here
Drill through
Cross-report
Off
Keep all filters
On
Add drill-through fields here
Data
Search
Inventory Analysis
Avg Unit Price
Country
CustomerID
Description
InvoiceDate
Date Hierarchy
Year
Quarter
Month
Day
InvoiceNo
Quantity
Revenue
Revenue % differ...
StockCode
StockCode (grou...
Sum Qty
UnitPrice

Observing the top n^{th} inventory items is one of the most useful visualizations. For instance, the graph below displays the top 4 products in terms of overall sales.



The pie chart below shows the top 5 customer IDs based on total sales.

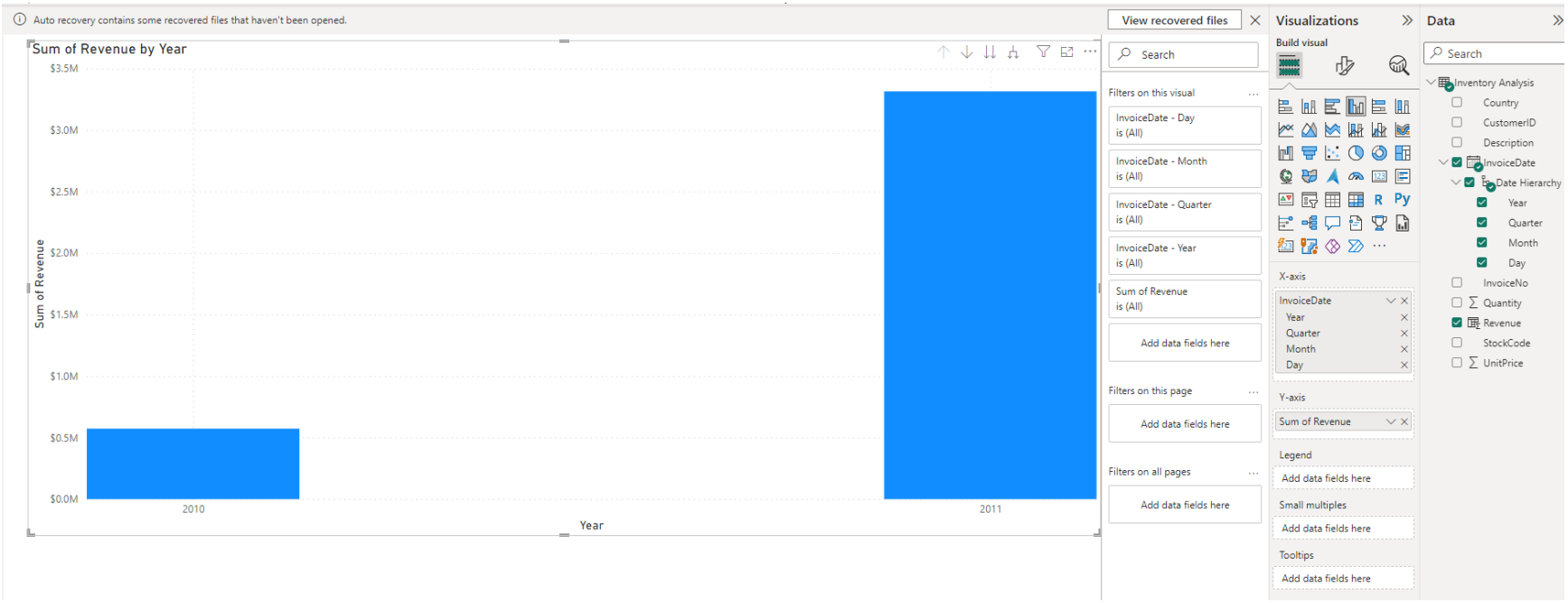


When it comes to drill through functionality, in MS Power BI it allows users to access information at levels of detail. Here are a few examples of dashboard charts that demonstrate drill through capabilities for inventory management.

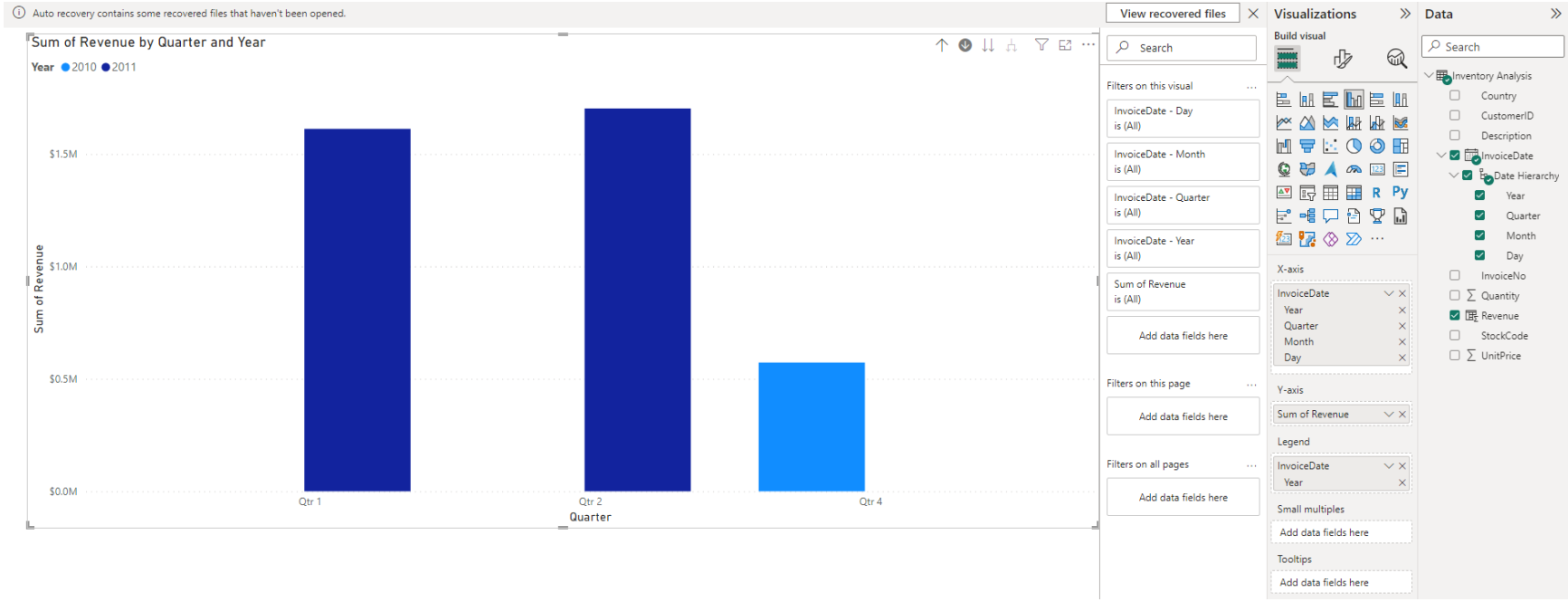
- Viewing moving items from a level (item group or year) to a more specific level (item or month).
- Comparing revenue and gross profit from a broader perspective (year or item group) to a narrower one (month or item).
- Analyzing item quantity from a country view down to warehouse locations or cities.
- Exploring the stock value by moving from a view (item group or country) down to specific warehouse locations.
- Examining stock turnover by diving into details going from an item group level to an item level.
- Analyzing inbound and outbound inventory levels by transitioning from data to data.

These examples highlight how drill through functionality in MS Power BI enables users to navigate through levels of information, for inventory management.

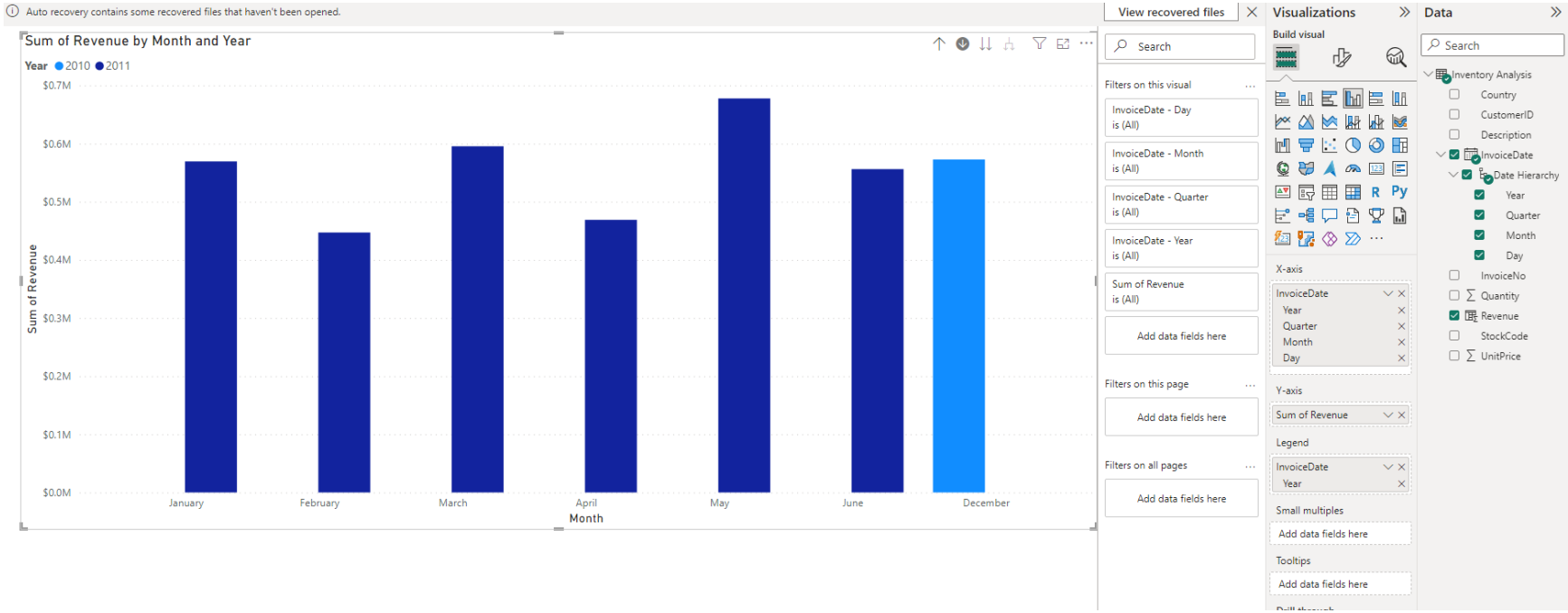
Each year's sum of revenue is displayed in the bar chart below, along with the date hierarchy.



When the user begins to use the drill-through feature within the chart, the Total Revenue by Quarter may be displayed.


Auto recovery contains some recovered files that haven't been opened.
View recovered files
Sum of Revenue by Quarter and Year
Year 2010 2011
$1.5M
$1.0M
$0.5M
$0.0M
Sum of Revenue
Qtr 1
Qtr 2
Qtr 4
Quarter
Filters on this visual
InvoiceDate - Day is (All)
InvoiceDate - Month is (All)
InvoiceDate - Quarter is (All)
InvoiceDate - Year is (All)
Sum of Revenue is (All)
Add data fields here
Filters on this page
Add data fields here
Filters on all pages
Add data fields here
Visualizations
Build visual
X-axis
InvoiceDate
Year
Quarter
Month
Day
Y-axis
Sum of Revenue
Legend
InvoiceDate
Year
Small multiples
Add data fields here
Tooltips
Add data fields here
Data
Search
Inventory Analysis
Country
CustomerID
Description
InvoiceDate
Date Hierarchy
Year
Quarter
Month
Day
InvoiceNo
Quantity
Revenue
StockCode
UnitPrice

In order to gain more details about the Total Revenue, the user can drill down until month or even day. The graph for May 2011 indicates a high revenue compared to the other months.



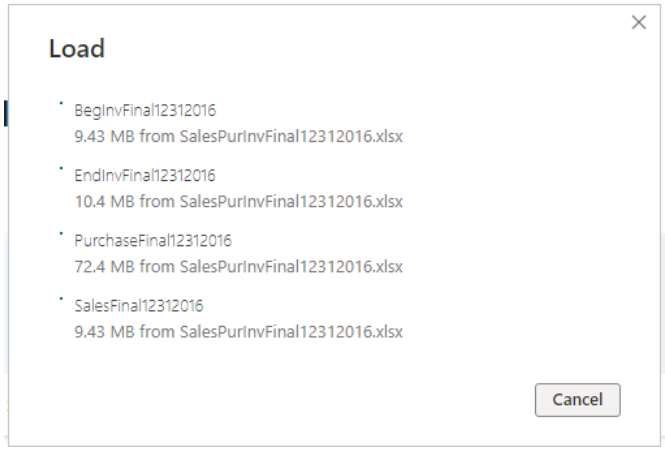
Task c: Inventory Metrics and Alerts

- Identify at least three critical inventory metrics or KPIs (e.g., inventory turnover rate, days of inventory) that you would include in the dashboard.
- Explain the importance of each metric and how it would be calculated from the available data.
- Describe how you would set up conditional formatting or alerts to highlight potential inventory issues or anomalies.

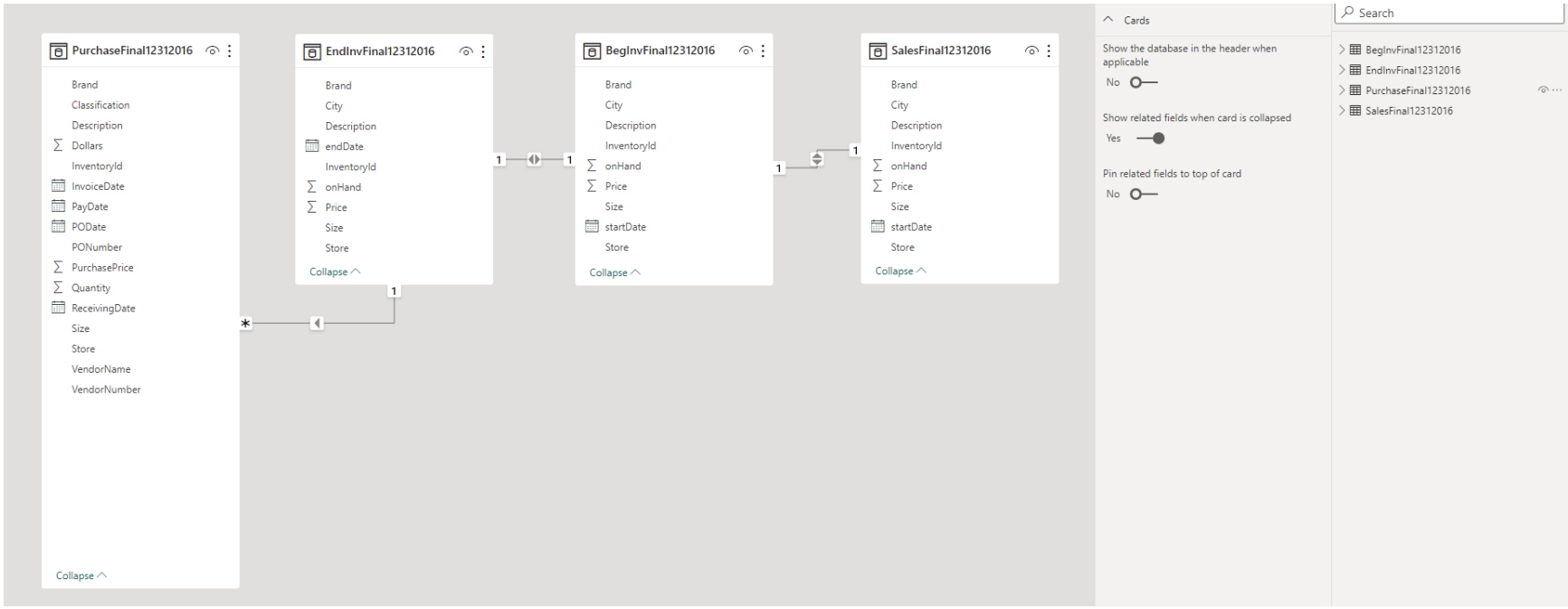
Data Source: https://www.kaggle.com/datasets/bhanupratapbiswas/inventory-analysis-case-study

Source File: SalesPurInvFinal12312016.xlsx

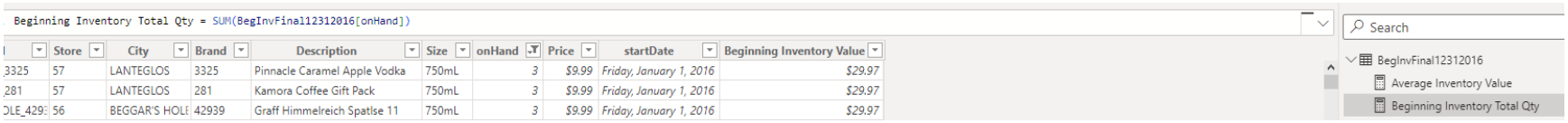
Loading 4 sheets from the excel file.



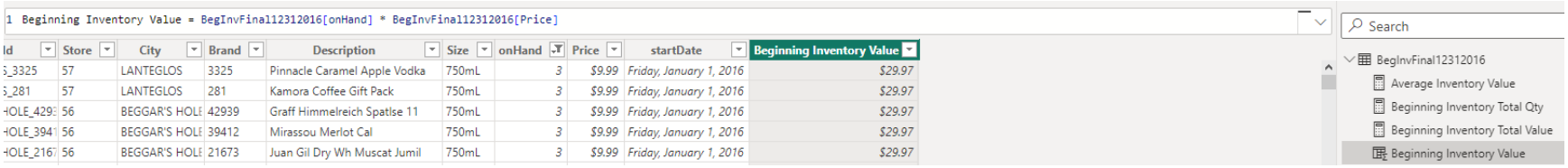
Creating the relationship map using the model view.



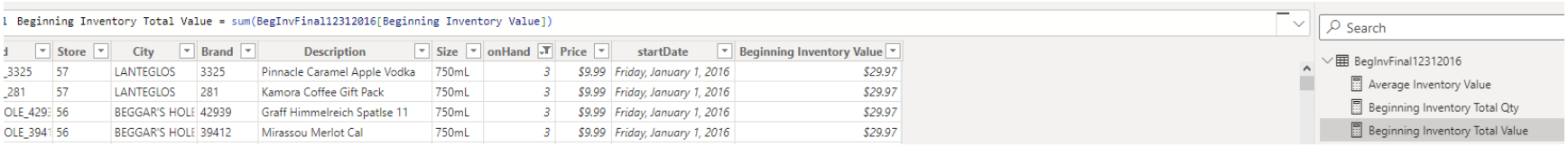
Including a new measure to calculate the total inventory quantity as of the year's beginning.



Adding a new column to calculate the inventory value for each line item as of the year's beginning.



Including a new measure to calculate the total inventory value as of the year's beginning.



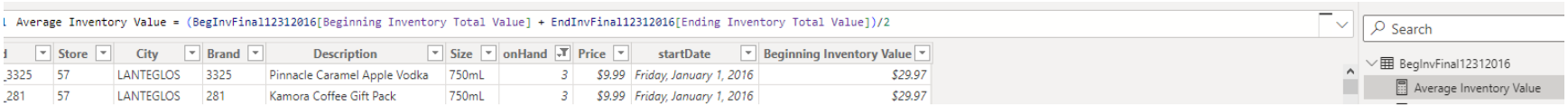
```
Beginning Inventory Total Value = sum(BegInvFinal12312016[Beginning Inventory Value])
```

	Store	City	Brand	Description	Size	onHand	Price	startDate	Beginning Inventory Value
_3325	57	LANTEGLOS	3325	Pinnacle Caramel Apple Vodka	750mL	3	$9.99	Friday, January 1, 2016	$29.97
_281	57	LANTEGLOS	281	Kamora Coffee Gift Pack	750mL	3	$9.99	Friday, January 1, 2016	$29.97
OLE_429	56	BEGGAR'S HOLE	42939	Graff Himmelreich Spatlse 11	750mL	3	$9.99	Friday, January 1, 2016	$29.97
OLE_394	56	BEGGAR'S HOLE	39412	Mirassou Merlot Cal	750mL	3	$9.99	Friday, January 1, 2016	$29.97

Search

BegInvFinal12312016
- Average Inventory Value
- Beginning Inventory Total Qty
- Beginning Inventory Total Value

Including a new measure to calculate the average inventory value for the year 2016.



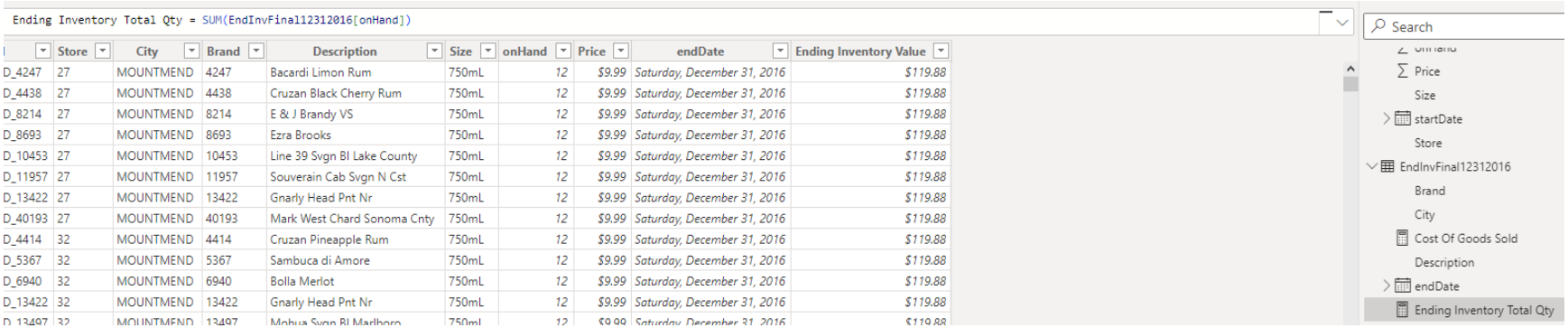
```
Average Inventory Value = (BegInvFinal12312016[Beginning Inventory Total Value] + EndInvFinal12312016[Ending Inventory Total Value])/2
```

	Store	City	Brand	Description	Size	onHand	Price	startDate	Beginning Inventory Value
_3325	57	LANTEGLOS	3325	Pinnacle Caramel Apple Vodka	750mL	3	$9.99	Friday, January 1, 2016	$29.97
_281	57	LANTEGLOS	281	Kamora Coffee Gift Pack	750mL	3	$9.99	Friday, January 1, 2016	$29.97

Search

BegInvFinal12312016
- Average Inventory Value

Including a new measure to calculate the total inventory quantity as of the year's end.



```
Ending Inventory Total Qty = SUM(EndInvFinal12312016[onHand])
```

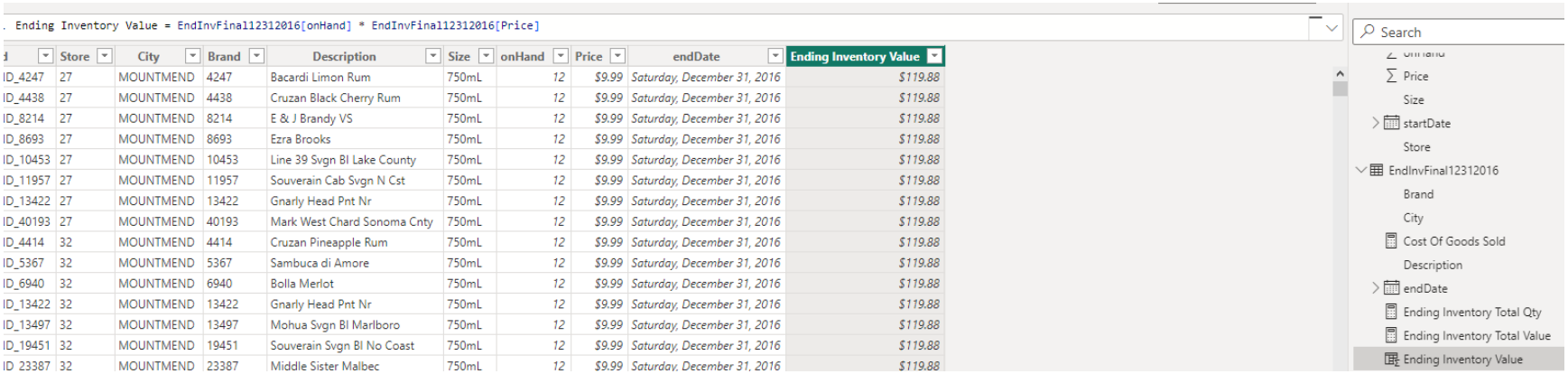
	Store	City	Brand	Description	Size	onHand	Price	endDate	Ending Inventory Value
D_4247	27	MOUNTMEND	4247	Bacardi Limon Rum	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
D_4438	27	MOUNTMEND	4438	Cruzan Black Cherry Rum	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
D_8214	27	MOUNTMEND	8214	E & J Brandy VS	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
D_8693	27	MOUNTMEND	8693	Ezra Brooks	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
D_10453	27	MOUNTMEND	10453	Line 39 Svgn Bl Lake County	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
D_11957	27	MOUNTMEND	11957	Souverain Cab Svgn N Cst	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
D_13422	27	MOUNTMEND	13422	Gnarly Head Pnt Nr	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
D_40193	27	MOUNTMEND	40193	Mark West Chard Sonoma Cnty	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
D_4414	32	MOUNTMEND	4414	Cruzan Pineapple Rum	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
D_5367	32	MOUNTMEND	5367	Sambuca di Amore	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
D_6940	32	MOUNTMEND	6940	Bolla Merlot	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
D_13422	32	MOUNTMEND	13422	Gnarly Head Pnt Nr	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
D_13497	32	MOUNTMEND	13497	Mohua Svgn Bl Marlboro	750mL	12	$9.99	Saturday, December 31, 2016	$119.88

Search

- Price
- Size
- startDate
- Store

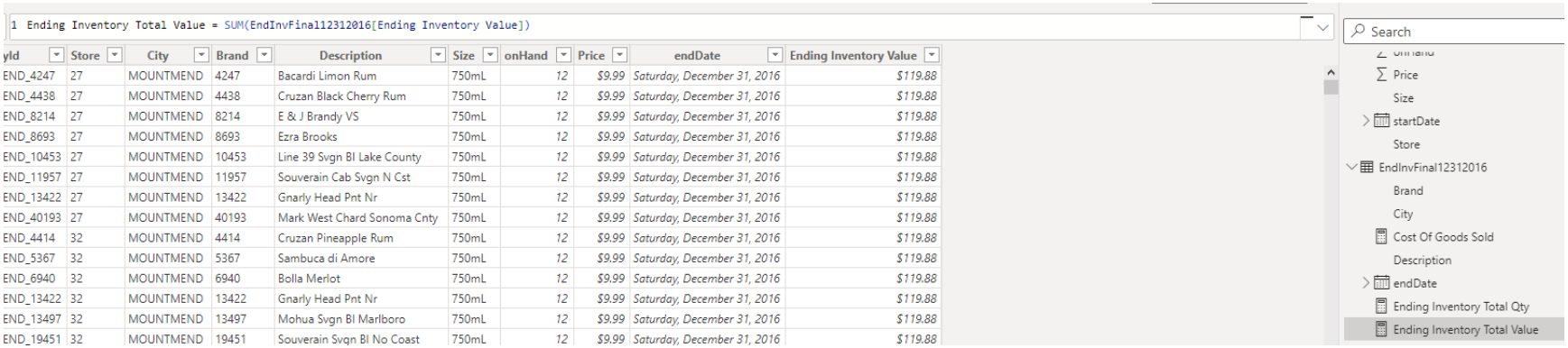
EndInvFinal12312016
- Brand
- City
- Cost Of Goods Sold
- Description
- endDate
- Ending Inventory Total Qty

Including a new column to calculate the inventory value for each line item as of the year's end.



	Store	City	Brand	Description	Size	onHand	Price	endDate	Ending Inventory Value
ID_4247	27	MOUNTMEND	4247	Bacardi Limon Rum	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ID_4438	27	MOUNTMEND	4438	Cruzan Black Cherry Rum	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ID_8214	27	MOUNTMEND	8214	E & J Brandy VS	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ID_8693	27	MOUNTMEND	8693	Ezra Brooks	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ID_10453	27	MOUNTMEND	10453	Line 39 Svgn Bl Lake County	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ID_11957	27	MOUNTMEND	11957	Souverain Cab Svgn N Cst	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ID_13422	27	MOUNTMEND	13422	Gnarly Head Pnt Nr	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ID_40193	27	MOUNTMEND	40193	Mark West Chard Sonoma Cnty	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ID_4414	32	MOUNTMEND	4414	Cruzan Pineapple Rum	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ID_5367	32	MOUNTMEND	5367	Sambuca di Amore	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ID_6940	32	MOUNTMEND	6940	Bolla Merlot	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ID_13422	32	MOUNTMEND	13422	Gnarly Head Pnt Nr	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ID_13497	32	MOUNTMEND	13497	Mohua Svgn Bl Marlboro	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ID_19451	32	MOUNTMEND	19451	Souverain Svgn Bl No Coast	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ID 23387	32	MOUNTMEND	23387	Middle Sister Malbec	750mL	12	$9.99	Saturday, December 31, 2016	$119.88

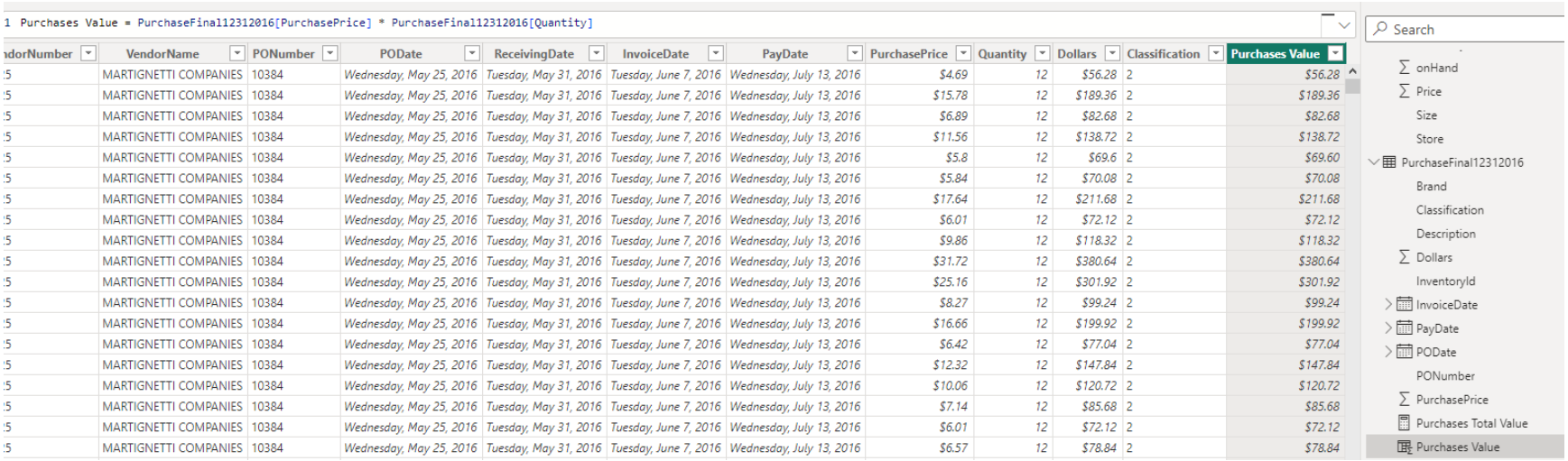
Adding a new measure to calculate the total inventory value as of the year's end.



```
1 Ending Inventory Total Value = SUM(EndInvFinal12312016[Ending Inventory Value])
```

yId	Store	City	Brand	Description	Size	onHand	Price	endDate	Ending Inventory Value
END_4247	27	MOUNTMEND	4247	Bacardi Limon Rum	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_4438	27	MOUNTMEND	4438	Cruzan Black Cherry Rum	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_8214	27	MOUNTMEND	8214	E & J Brandy VS	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_8693	27	MOUNTMEND	8693	Ezra Brooks	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_10453	27	MOUNTMEND	10453	Line 39 Svgn Bl Lake County	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_11957	27	MOUNTMEND	11957	Souverain Cab Svgn N Cst	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_13422	27	MOUNTMEND	13422	Gnarly Head Pnt Nr	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_40193	27	MOUNTMEND	40193	Mark West Chard Sonoma Cnty	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_4414	32	MOUNTMEND	4414	Cruzan Pineapple Rum	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_5367	32	MOUNTMEND	5367	Sambuca di Amore	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_6940	32	MOUNTMEND	6940	Bolla Merlot	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_13422	32	MOUNTMEND	13422	Gnarly Head Pnt Nr	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_13497	32	MOUNTMEND	13497	Mohua Svgn Bl Marlboro	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_19451	32	MOUNTMEND	19451	Souverain Svgn Bl No Coast	750mL	12	$9.99	Saturday, December 31, 2016	$119.88

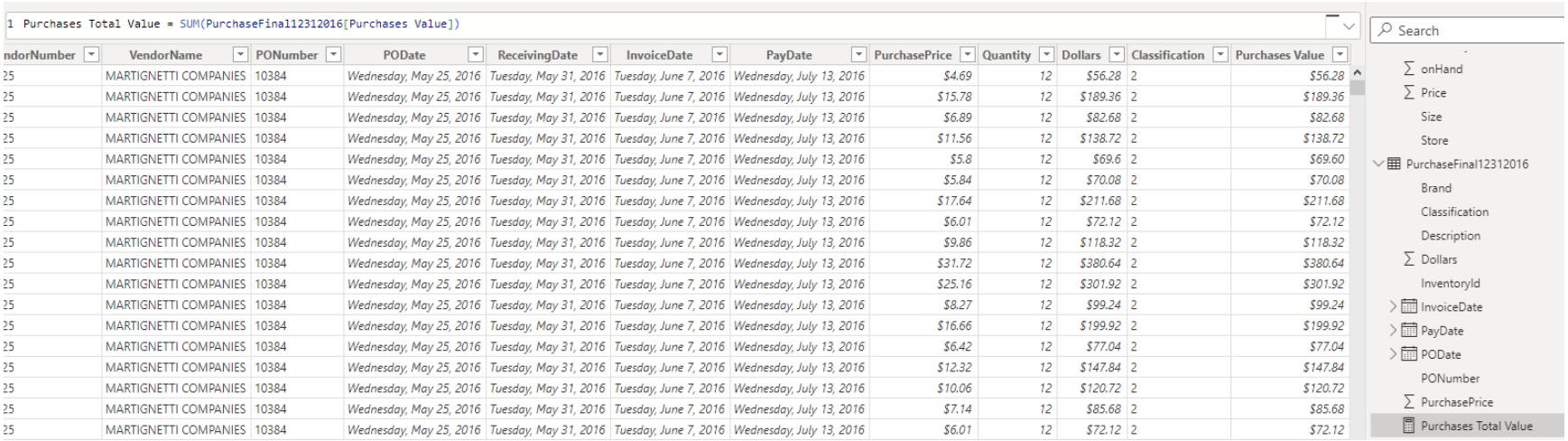
Including a new column to calculate the purchase value for each line item for 2016.



```
1 Purchases Value = PurchaseFinal12312016[PurchasePrice] * PurchaseFinal12312016[Quantity]
```

ndorNumber	VendorName	PONumber	PODate	ReceivingDate	InvoiceDate	PayDate	PurchasePrice	Quantity	Dollars	Classification	Purchases Value
5	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$4.69	12	$56.28	2	$56.28
5	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$15.78	12	$189.36	2	$189.36
5	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$6.89	12	$82.68	2	$82.68
5	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$11.56	12	$138.72	2	$138.72
5	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$5.8	12	$69.6	2	$69.60
5	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$5.84	12	$70.08	2	$70.08
5	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$17.64	12	$211.68	2	$211.68
5	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$6.01	12	$72.12	2	$72.12
5	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$9.86	12	$118.32	2	$118.32
5	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$31.72	12	$380.64	2	$380.64
5	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$25.16	12	$301.92	2	$301.92
5	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$8.27	12	$99.24	2	$99.24
5	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$16.66	12	$199.92	2	$199.92
5	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$6.42	12	$77.04	2	$77.04
5	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$12.32	12	$147.84	2	$147.84
5	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$10.06	12	$120.72	2	$120.72
5	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$7.14	12	$85.68	2	$85.68
5	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$6.01	12	$72.12	2	$72.12
5	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$6.57	12	$78.84	2	$78.84

Including a new measure to calculate the total purchase value for 2016.



```
1 Purchases Total Value = SUM(PurchaseFinal12312016[Purchases Value])
```

ndorNumber	VendorName	PONumber	PODate	ReceivingDate	InvoiceDate	PayDate	PurchasePrice	Quantity	Dollars	Classification	Purchases Value
25	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$4.69	12	$56.28	2	$56.28
25	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$15.78	12	$189.36	2	$189.36
25	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$6.89	12	$82.68	2	$82.68
25	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$11.56	12	$138.72	2	$138.72
25	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$5.8	12	$69.6	2	$69.60
25	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$5.84	12	$70.08	2	$70.08
25	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$17.64	12	$211.68	2	$211.68
25	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$6.01	12	$72.12	2	$72.12
25	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$9.86	12	$118.32	2	$118.32
25	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$31.72	12	$380.64	2	$380.64
25	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$25.16	12	$301.92	2	$301.92
25	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$8.27	12	$99.24	2	$99.24
25	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$16.66	12	$199.92	2	$199.92
25	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$6.42	12	$77.04	2	$77.04
25	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$12.32	12	$147.84	2	$147.84
25	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$10.06	12	$120.72	2	$120.72
25	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$7.14	12	$85.68	2	$85.68
25	MARTIGNETTI COMPANIES	10384	Wednesday, May 25, 2016	Tuesday, May 31, 2016	Tuesday, June 7, 2016	Wednesday, July 13, 2016	$6.01	12	$72.12	2	$72.12

Cost of Goods Sold (COGS)

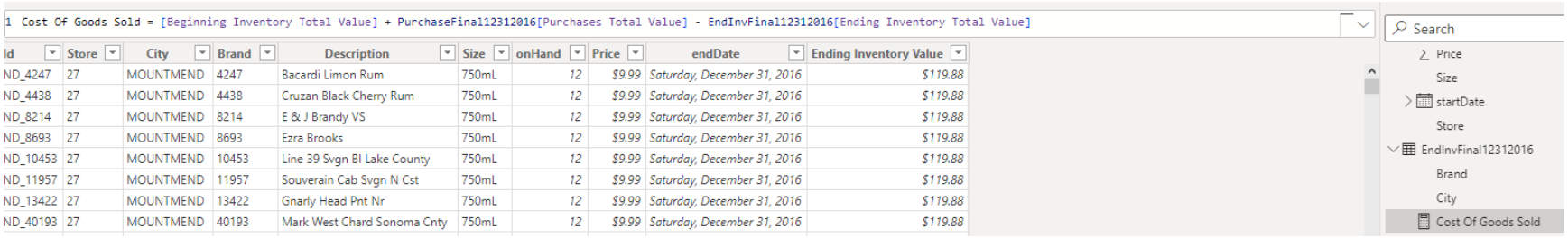
To determine the value of your ending inventory at the conclusion of a specific accounting period, start with your beginning inventory, add net purchases, and subtract cost of goods sold (COGS).

When applying the above theory, we can find the COGS if the year end's inventory is available.

Hence,

2016 Beginning Inventory Value + 2016 Net Purchases Value – 2016 Ending Inventory Value = 2016 Cost of Goods Sold (COGS)

Therefore, the above calculation can be included as a new measure as below.



Id	Store	City	Brand	Description	Size	onHand	Price	endDate	Ending Inventory Value
ND_4247	27	MOUNTMEND	4247	Bacardi Limon Rum	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ND_4438	27	MOUNTMEND	4438	Cruzan Black Cherry Rum	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ND_8214	27	MOUNTMEND	8214	E & J Brandy VS	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ND_8693	27	MOUNTMEND	8693	Ezra Brooks	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ND_10453	27	MOUNTMEND	10453	Line 39 Svgn Bl Lake County	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ND_11957	27	MOUNTMEND	11957	Souverain Cab Svgn N Cst	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ND_13422	27	MOUNTMEND	13422	Gnarly Head Pnt Nr	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
ND_40193	27	MOUNTMEND	40193	Mark West Chard Sonoma Cnty	750mL	12	$9.99	Saturday, December 31, 2016	$119.88

Inventory Turnover Ratio (ITR)

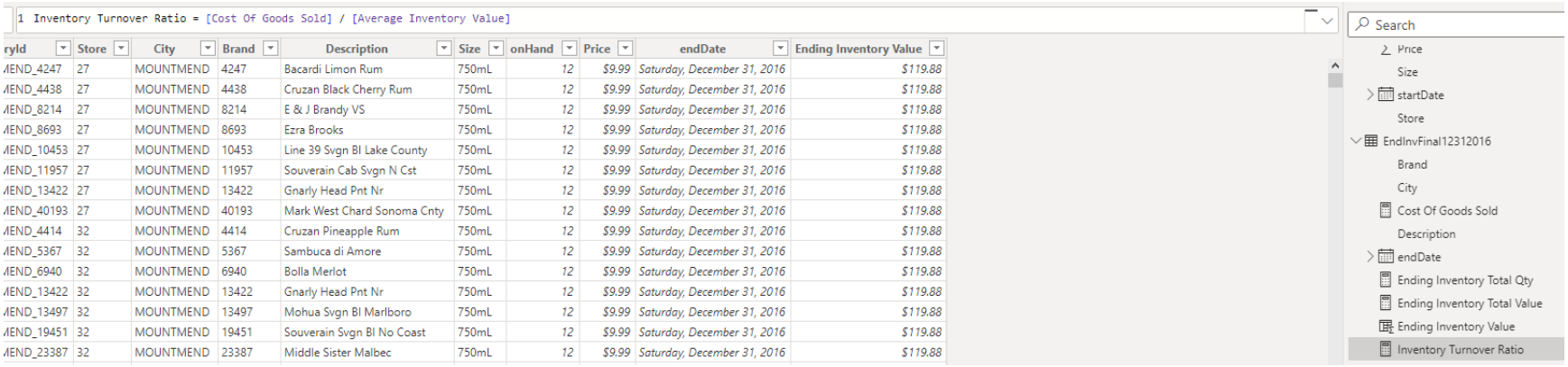
The average number of sales and inventory replacements made by the company in a given time period is shown by the Inventory Turnover Ratio (ITR).

Hence,

Inventory Turnover Ratio = Cost of goods sold / Average Inventory Value

The Inventory Turnover Ratio shows how successfully a business sells its stock. A corporation selling its stock quickly and a market need for its goods are both indicated by a rapid inventory turnover.

Adding a new measure to calculate the Inventory Turnover Ratio (ITR) for 2016.



ryId	Store	City	Brand	Description	Size	onHand	Price	endDate	Ending Inventory Value
MEND_4247	27	MOUNTMEND	4247	Bacardi Limon Rum	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
MEND_4438	27	MOUNTMEND	4438	Cruzan Black Cherry Rum	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
MEND_8214	27	MOUNTMEND	8214	E & J Brandy VS	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
MEND_8693	27	MOUNTMEND	8693	Ezra Brooks	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
MEND_10453	27	MOUNTMEND	10453	Line 39 Svgn Bl Lake County	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
MEND_11957	27	MOUNTMEND	11957	Souverain Cab Svgn N Cst	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
MEND_13422	27	MOUNTMEND	13422	Gnarly Head Pnt Nr	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
MEND_40193	27	MOUNTMEND	40193	Mark West Chard Sonoma Cnty	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
MEND_4414	32	MOUNTMEND	4414	Cruzan Pineapple Rum	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
MEND_5367	32	MOUNTMEND	5367	Sambuca di Amore	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
MEND_6940	32	MOUNTMEND	6940	Bolla Merlot	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
MEND_13422	32	MOUNTMEND	13422	Gnarly Head Pnt Nr	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
MEND_13497	32	MOUNTMEND	13497	Mohua Svgn Bl Marlboro	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
MEND_19451	32	MOUNTMEND	19451	Souverain Svgn Bl No Coast	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
MEND_23387	32	MOUNTMEND	23387	Middle Sister Malbec	750mL	12	$9.99	Saturday, December 31, 2016	$119.88

Days in Inventory (DII) / Days of Inventory (DOI) / Days Sales in Inventory (DSI) / Days in Inventory Outstanding (DIO) / Inventory Days of Supply

The days of Inventory that start to rise typically indicate that the company is keeping more inventory on hand or that sales have begun to slacken. Days of Inventory is useful for planning or ensuring that significant cyclical variance isn't hidden by averages. A lower DOI is preferable in general. It indicates that a company is doing a good job of selling what it has, and that less money is being held in inventory.

Formular for Days of Inventory

Days of Inventory = (Average Inventory Value / Cost of Goods Sold) x Days in time period

The average inventory refers to the average inventory value in dollars for a specific time period, not the inventory unit itself.

Formular for Average Inventory

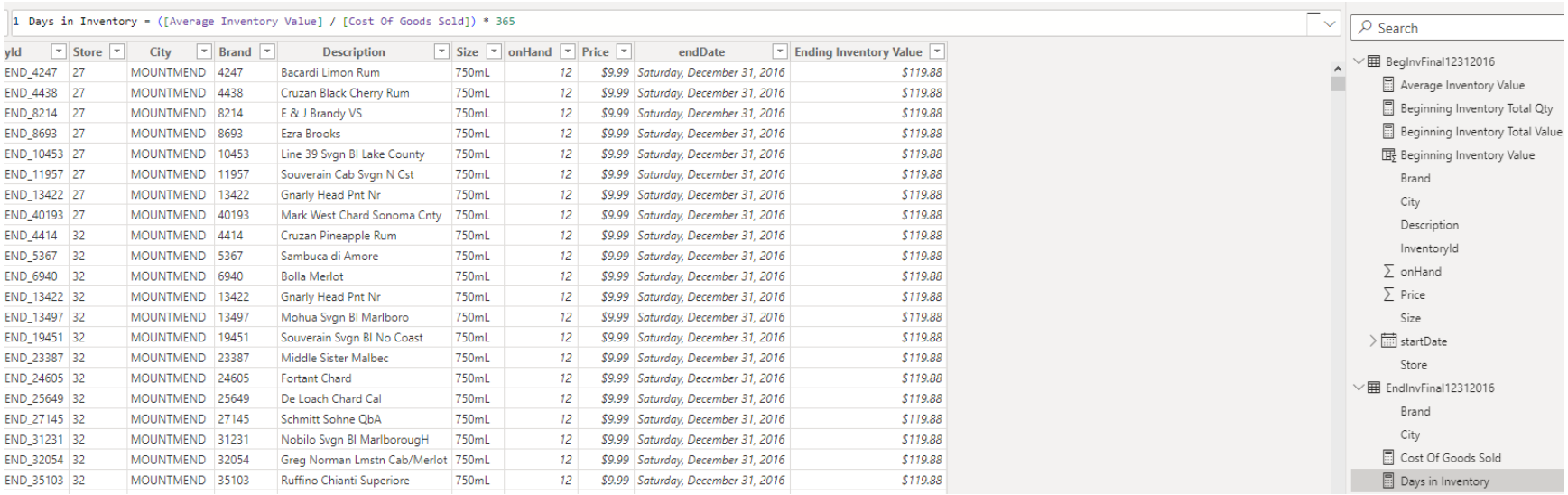
Average Inventory = (Beginning Inventory + Ending Inventory) / 2

However, if the aforementioned calculation utilizes the current inventory instead of the average inventory, it will indicate how many future days of inventory are now in stock.

Impotencies of Days of Inventory

- In isolation, a single value for a single time period might not represent much, but when Days of Inventory is monitored over time, it might reveal modifications and patterns that, in turn, might reveal clues regarding inventory control.
- In the same industry, comparable businesses from the same time period can be compared using Days of Inventory.
- When it comes to cash management, the Days of Inventory play a vital role. So much money invested in inventory can lead to issues elsewhere, such as the inability to make supplier payments on schedule or invest in new markets.

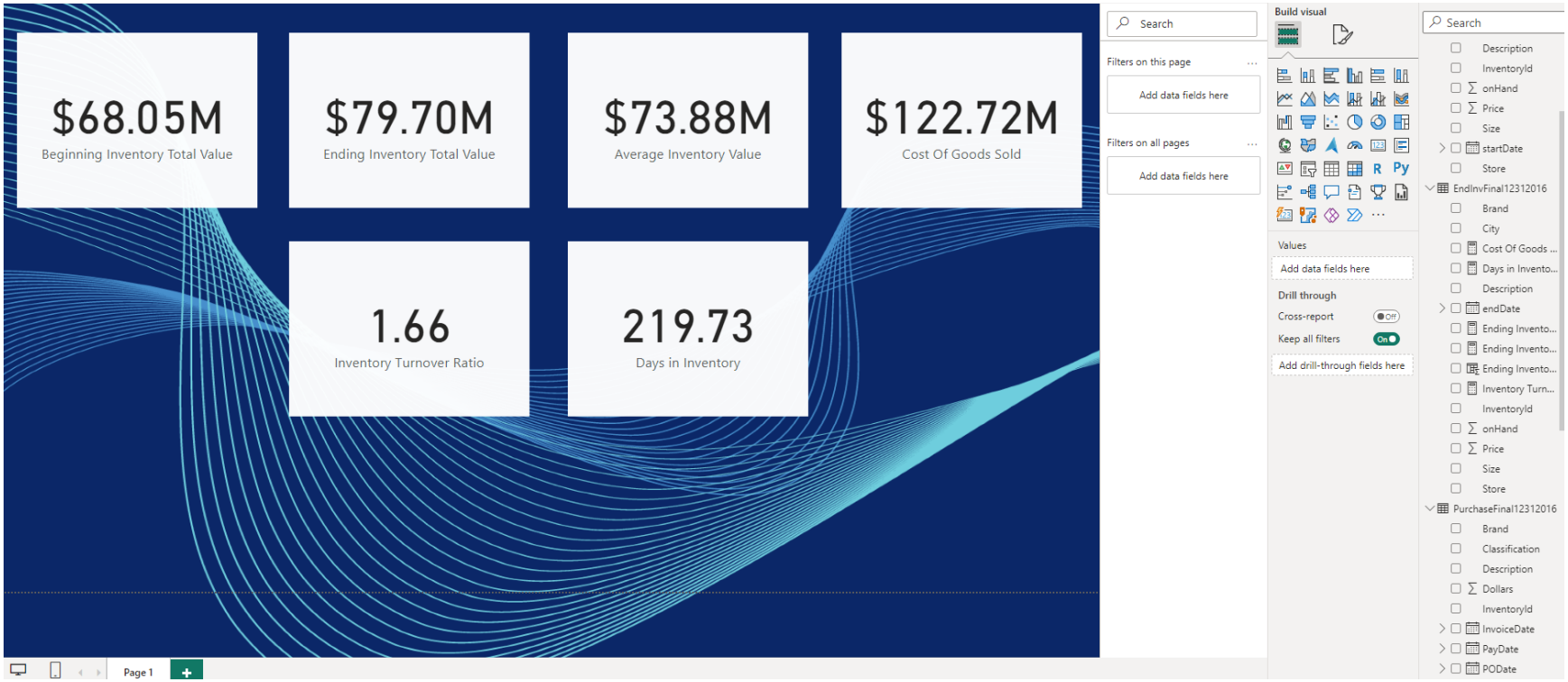
Including a new measure to calculate the Days in Inventory for 2016.



```
1 Days in Inventory = ([Average Inventory Value] / [Cost Of Goods Sold]) * 365
```

yld	Store	City	Brand	Description	Size	onHand	Price	endDate	Ending Inventory Value
END_4247	27	MOUNTMEND	4247	Bacardi Limon Rum	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_4438	27	MOUNTMEND	4438	Cruzan Black Cherry Rum	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_8214	27	MOUNTMEND	8214	E & J Brandy VS	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_8693	27	MOUNTMEND	8693	Ezra Brooks	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_10453	27	MOUNTMEND	10453	Line 39 Svgn Bl Lake County	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_11957	27	MOUNTMEND	11957	Souverain Cab Svgn N Cst	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_13422	27	MOUNTMEND	13422	Gnarly Head Pnt Nr	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_40193	27	MOUNTMEND	40193	Mark West Chard Sonoma Cnty	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_4414	32	MOUNTMEND	4414	Cruzan Pineapple Rum	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_5367	32	MOUNTMEND	5367	Sambuca di Amore	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_6940	32	MOUNTMEND	6940	Bolla Merlot	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_13422	32	MOUNTMEND	13422	Gnarly Head Pnt Nr	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_13497	32	MOUNTMEND	13497	Mohua Svgn Bl Marlboro	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_19451	32	MOUNTMEND	19451	Souverain Svgn Bl No Coast	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_23387	32	MOUNTMEND	23387	Middle Sister Malbec	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_24605	32	MOUNTMEND	24605	Fortant Chard	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_25649	32	MOUNTMEND	25649	De Loach Chard Cal	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_27145	32	MOUNTMEND	27145	Schmitt Sohne QbA	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_31231	32	MOUNTMEND	31231	Nobilo Svgn Bl MarlboroughH	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_32054	32	MOUNTMEND	32054	Greg Norman Lmstn Cab/Merlot	750mL	12	$9.99	Saturday, December 31, 2016	$119.88
END_35103	32	MOUNTMEND	35103	Ruffino Chianti Superiore	750mL	12	$9.99	Saturday, December 31, 2016	$119.88

Adding the above calculations as cards on the Power BI canvas and creating a Power BI dashboard.

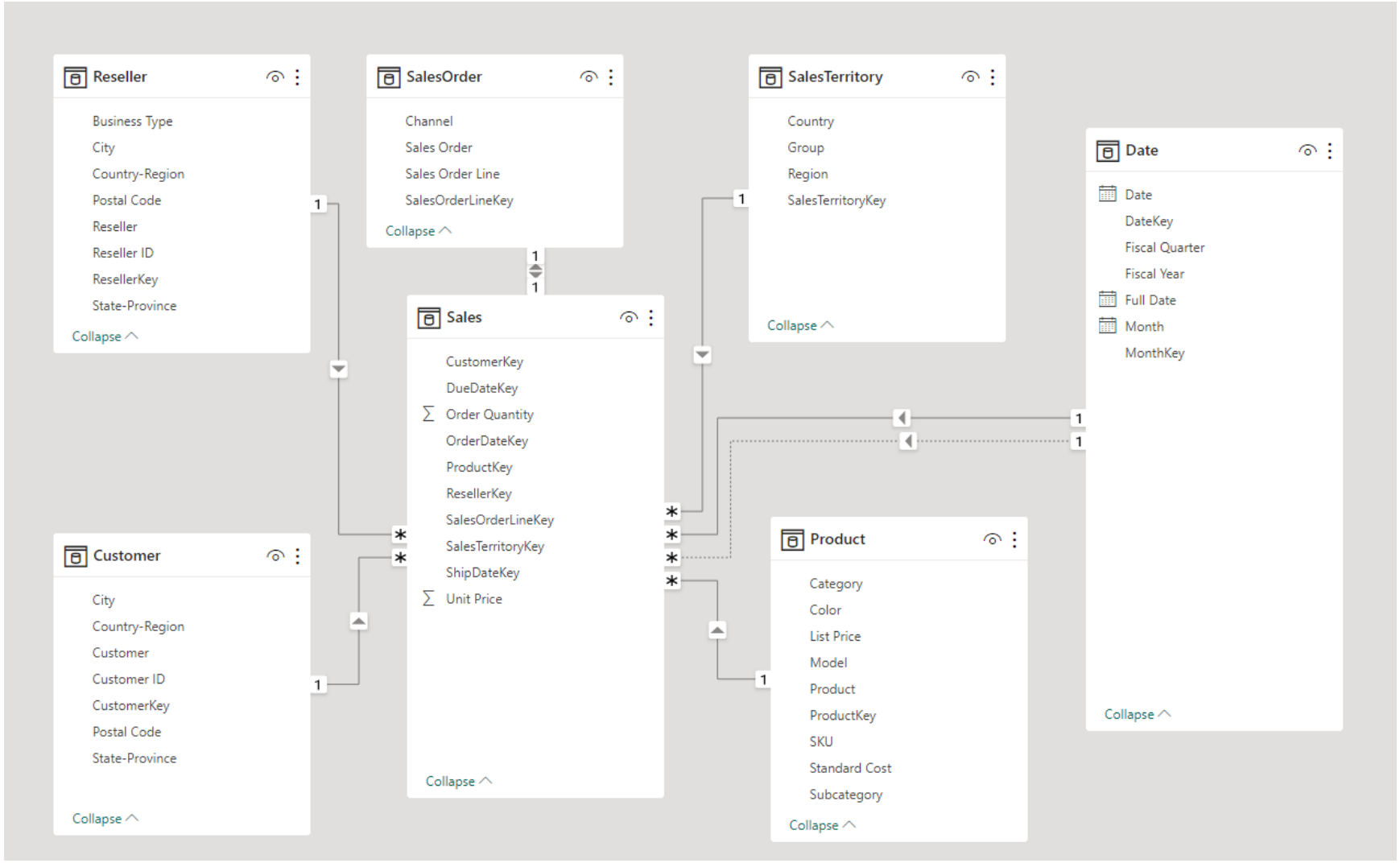


Data source: https://www.kaggle.com/datasets/kyanyoga/sample-sales-data

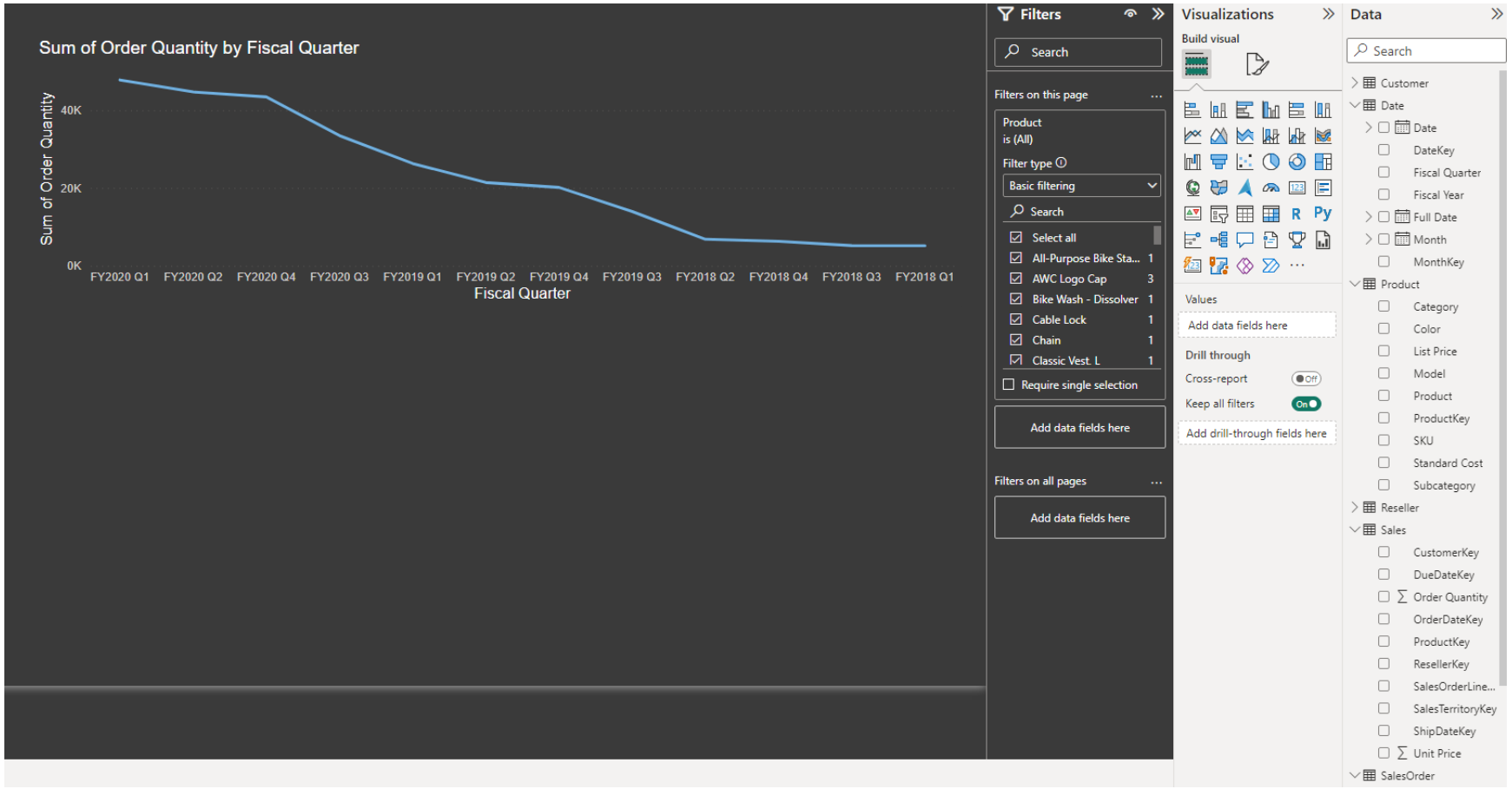
Data File: sales_data_sample.csv

Data source: AW Dataset.xlsx

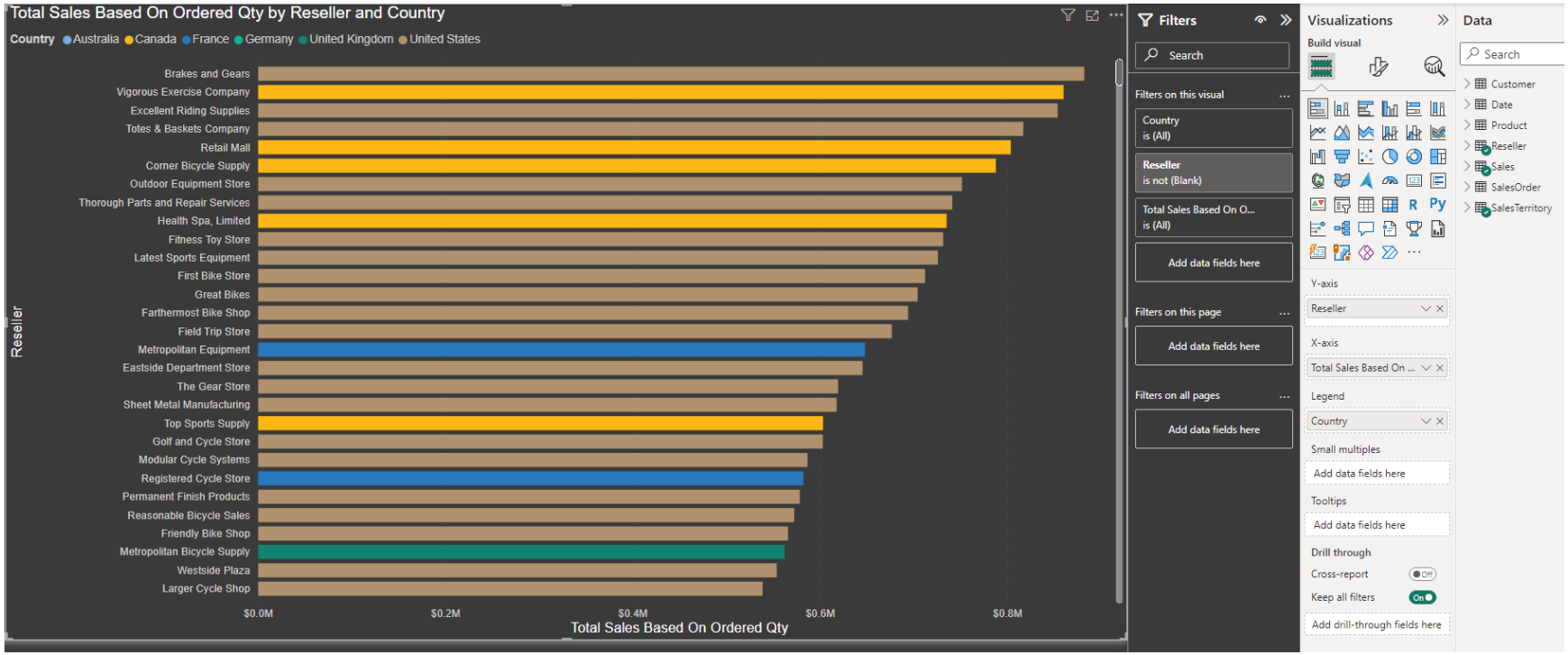
Generating relationships between the tables (excel datasets / sheets)



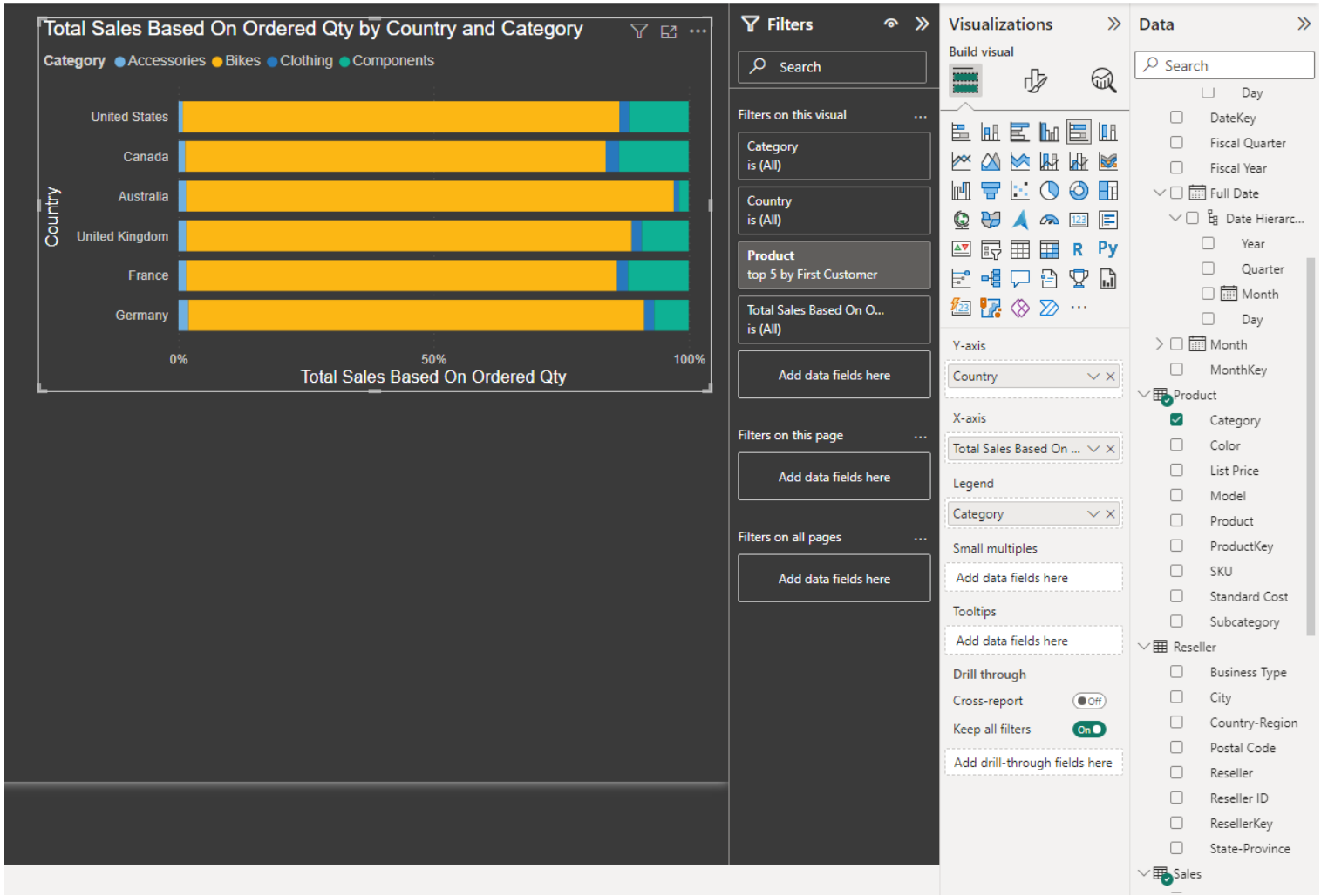
The total order quantity can be seen in the line chart below by fiscal year, and it has gradually increased from 2018 to 2020.


Sum of Order Quantity by Fiscal Quarter
Sum of Order Quantity
40K
20K
0K
FY2020 Q1
FY2020 Q2
FY2020 Q4
FY2020 Q3
FY2019 Q1
FY2019 Q2
FY2019 Q4
FY2019 Q3
FY2018 Q2
FY2018 Q4
FY2018 Q3
FY2018 Q1
Fiscal Quarter
Filters
Search
Filters on this page
Product
is (All)
Filter type
Basic filtering
Search
Select all
All-Purpose Bike Sta... 1
AWC Logo Cap 3
Bike Wash - Dissolver 1
Cable Lock 1
Chain 1
Classic Vest, L 1
Require single selection
Add data fields here
Filters on all pages
Add data fields here
Visualizations
Build visual
Values
Add data fields here
Drill through
Cross-report
Off
Keep all filters
On
Add drill-through fields here
Data
Search
Customer
Date
Date
DateKey
Fiscal Quarter
Fiscal Year
Full Date
Month
MonthKey
Product
Category
Color
List Price
Model
Product
ProductKey
SKU
Standard Cost
Subcategory
Reseller
Sales
CustomerKey
DueDateKey
Order Quantity
OrderDateKey
ProductKey
ResellerKey
SalesOrderLine...
SalesTerritoryKey
ShipDateKey
Unit Price
SalesOrder

The below clustered bar chart displays the total sales based on ordered quantity by reseller and country. It also shows that bikes and gears have a huge demand

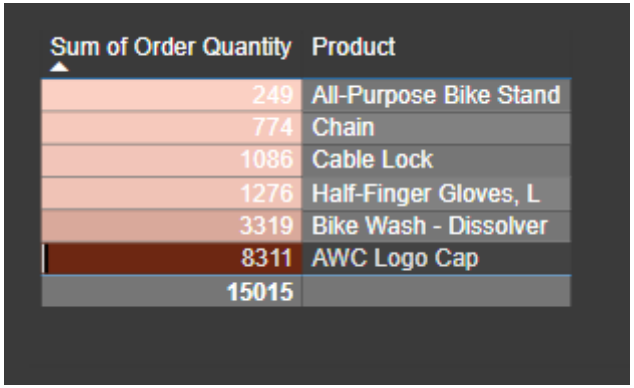


The total sales by country and category are shown in the 100% stacked bar chart below. This figure shows that components sell at a very low rate when there is a significant market for bikes in Australia.



Conditional formatting & alerts: -

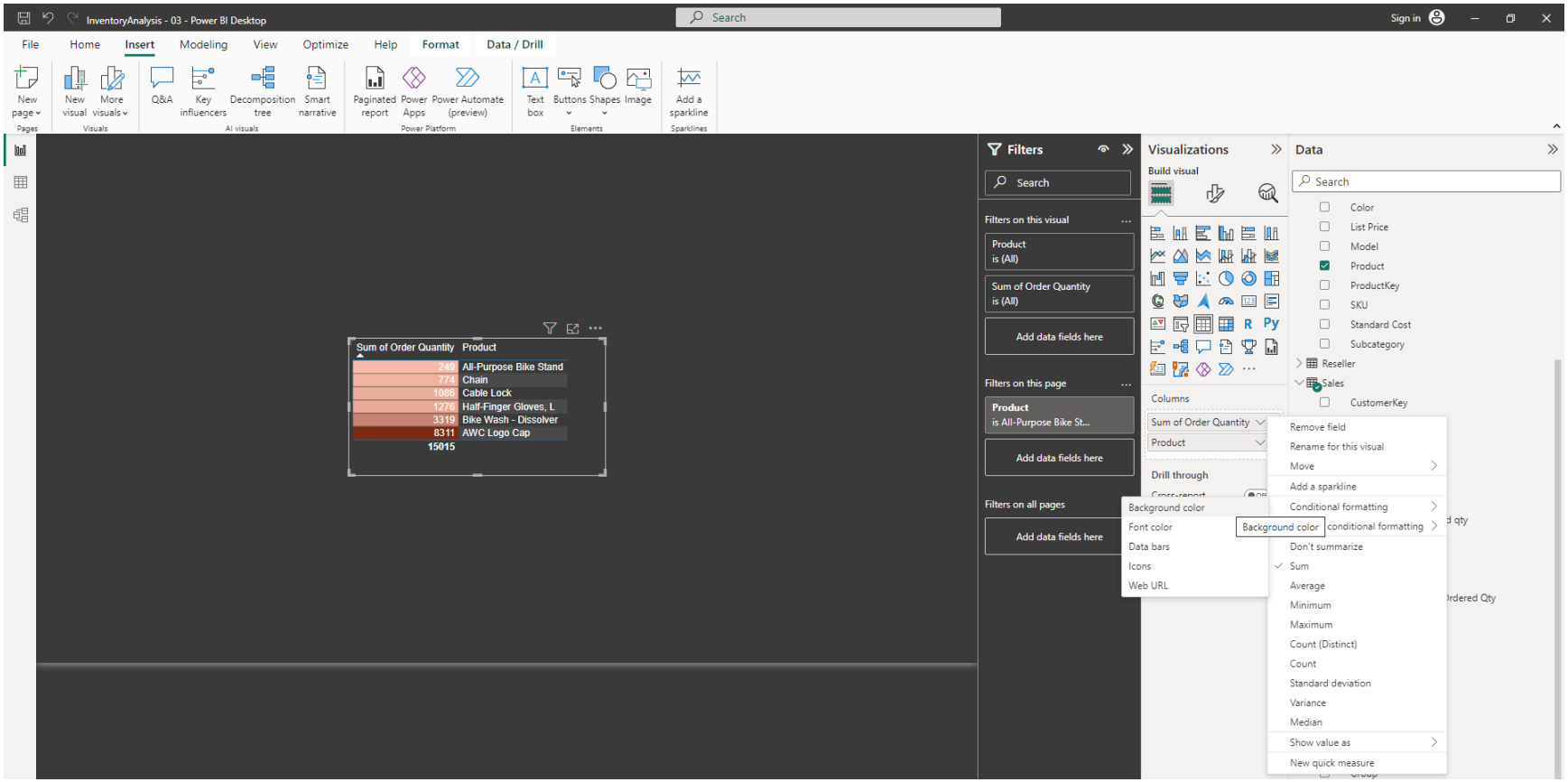
When conditional formatting is applied to the total order the quantity in the table below, the background color makes the maximum order quantity noticeable.



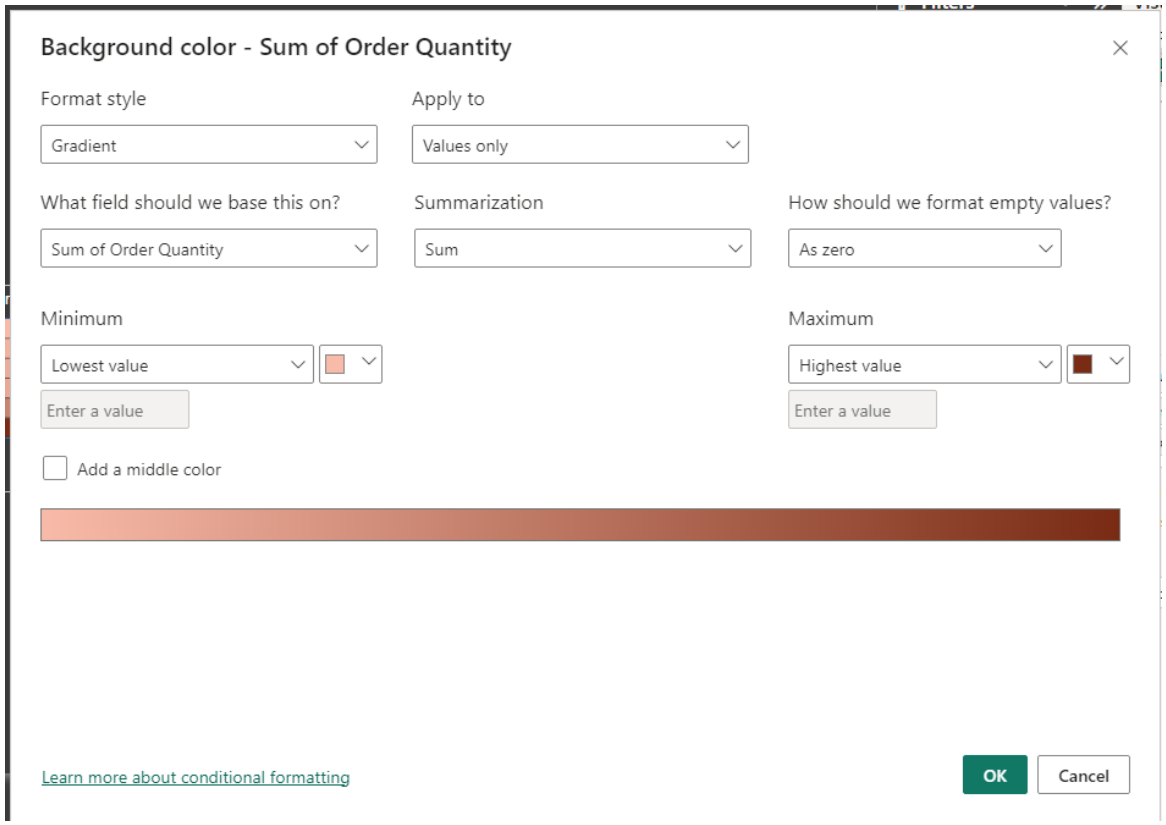
Sum of Order Quantity	Product
249	All-Purpose Bike Stand
774	Chain
1086	Cable Lock
1276	Half-Finger Gloves, L
3319	Bike Wash - Dissolver
8311	AWC Logo Cap
15015	

Applying conditional formatting on the sum of order quantity column: -

- Select the visual and click on the relevant column name.
- Select the conditional formatting option from the popup menu and next select the background color.



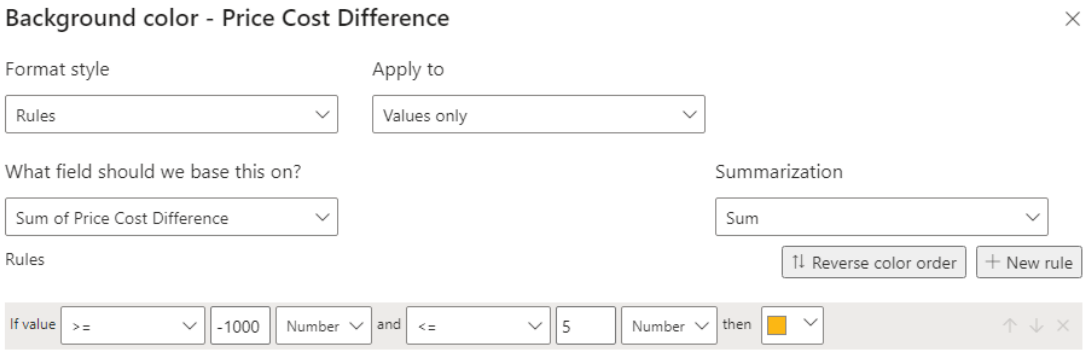
- Select colors for the lowest and maximum values.
- The color will change based on the sum of order quantity.



The user can double check the availability of the relevant item in the warehouse or with the supplier by looking at the color spectrum as well as the darkest color (depending on the parameters applied).

The cost, price, and difference of price and cost for each product are listed in the table below. The conditional formatting also takes place to show if the Price & Cost difference is less than $5.00. As a result, the user can see which products in the list have a lower profit margin than the others, and can take quick action to reduce the profit drop downs.

Product	Standard Cost	List Price	Price Cost Difference
Bike Wash - Dissolver	$2.97	$7.95	$4.98
AWC Logo Cap	$5.23	$8.64	$3.41
AWC Logo Cap	$5.71	$8.64	$2.94
AWC Logo Cap	$6.92	$8.99	$2.07
Chain	$8.99	$20.24	$11.25
Half-Finger Gloves, L	$9.16	$24.49	$15.33
Half-Finger Gloves, L	$9.71	$23.55	$13.83
Cable Lock	$10.31	$25.00	$14.69
All-Purpose Bike Stand	$59.47	$159.00	$99.53
Total			



Alerts: -

By utilizing MS Power Automate, it is possible to set up alerts when certain criteria are met.

Here is a general summary of what happens:

- A new flow should be developed in Power Automate.
- This trigger might depend on modifications to the data source or on a regular schedule.
- Include conditions to look for any potential inventory problems or irregularities. For instance, start an activity if the inventory goes below a certain threshold.
- Specify the procedures to be followed when the trigger condition is satisfied. This can involve notifying the accountable team or person through email.

Task d: User Training and Documentation

- Briefly outline your strategy for training end-users on how to use the Power BI inventory dashboard effectively.
- Discuss the importance of creating documentation or user guides to assist users in navigating and interpreting the dashboard.

To make sure end users can make use of the tool for data analysis and decision-making, training them on how to utilize the Power BI inventory dashboard effectively can be a structured process.

Training strategy:

1. It is an important requirement to pinpoint the target audience's needs and abilities. To properly train people to utilize Power BI and do data analysis, it is also necessary to understand their roles and responsibilities.

2. The training materials ought to be tailored, focused on roles and responsibilities of the warehouse and material control department users, and hands-on practice oriented. Designing training materials that are specific to the jobs and demands of the users is also a necessity. This could include textual instructions, instructional videos, or live demonstrations.

3. Basic training must cover how to execute data import and transformation, as well as how to connect to data sources, as well as an introduction to Power BI's interface and fundamental ideas. It is always preferable to explain data modeling and the connections between different datasets, making sure that users are aware of the dataset's structure, etc.

4. Instead of just continuing to teach theory with a PowerPoint slide presentation, the summary of the inventory dashboard's goal, major features, and insights it may provide should be a practical demonstration for the audience.

5. Training users on how to engage with the dashboard, including filtering, sorting, and slicing data to reveal insights, as well as on how to use visualizations like charts, graphs, and tables, is crucial under the data exploration subject matter. On the other hand, it helps them to understand how the dashboard functions and on the other hand, it is an opportunity to learn and familiarize themselves with the options on the dashboard.

6. Similar to other tools, Microsoft Power BI's sophisticated features, such as establishing custom measures or calculated columns, bookmarking, drill-through, and the integration of slicers, should be thoroughly explained to users.

7. End users must be shown collaboration and sharing inventory reports and dashboards, including real-time collaboration.

8. highlighting standard procedures for data visualization and report development, including tips on selecting suitable chart types and ensuring data quality, is crucial since the user has to know when to use whatever Power BI option. Otherwise, the story telling will be incoherent.

9. Users should be familiar with how to utilize tools for support and troubleshooting, such as internal support systems and community forums.

10. Encourage users to practice sample questions relating to Power BI visualizations, storytelling, data analysis, and drawing conclusions since it is essential for them to put their new knowledge into practice using practical exercises and sample datasets.

11. By using assessments and feedback, it is possible to gauge users' comprehension and improve training materials and content.

Iterative and user-responsive training is essential for success. It is a good practice to make sure users are adept at utilizing the Power BI inventory dashboard, periodically assess the training program's success and adjust as needed.

Creating documentation or user guides for a dashboard is crucial for several reasons:

1. New users and those who are not familiar with the dashboard will find it easier to become familiar with its features and functionalities. As a result, the learning curve is shortened, and the user experience is expedited.
2. Maintaining proper documentation guarantees that all users have access to the same information and instructions while maintaining consistency. It encourages the use of a consistent methodology while utilizing the dashboard and interpreting the data.
3. Users can look up the training materials whenever they need to at any time. It is a helpful resource for problem-solving, delineating steps, or reinforcing their memories of specific feature utilization.
4. Users may do their duties more quickly and effectively with the help of clear instructions and direction, which will decrease errors and boost productivity.
5. When there is straightforward guidance on how to use the Power BI dashboard and its features, it can help to empower users and make them feel more self-sufficient. It can be tiresome at times to continuously calling the IT support team for assistance. There are less calls for support because they are able to solve their problems on their own.
6. Training sessions may sometimes be costly and lengthy to conduct. However, thorough training sessions may not be as necessary, which can save time and money. Additionally, each user learns at various speeds, thus having a document can support independent learning at their own pace.
7. User manuals can assist users in evaluating the information displayed on the dashboard. This is necessary because it ensures that users base their decisions on precise data while working with complex or unfamiliar data.
8. A good user manual will inspire users to explore and interact with the dashboard more effortlessly and actively. Users are more likely to take advantage of its features effectively when they are aware of what they must do and what they are doing.
9. While human error cannot be completely eliminated, it can be reduced through implementing comprehensive documentation. By assisting users with data entry, filtering, and other tasks, it minimizes errors. This is essential when individuals are dealing with sensitive data.

10. Strict compliance rules should be used to secure data. The risk of data breaches and compliance violations can be minimized by using the user guides to make sure users handle data properly and follow rules and regulations. Because documentation may clearly show how and when data breaches can occur and who shouldn't see the data analysis, reports and related information.
11. By establishing a shared knowledge of the functions of the dashboard, documentation facilitates collaboration. When users from different teams share a common reference point, communication between them is enhanced.
12. Documentation can be updated to reflect changes as the dashboard develops or grows to serve various user groups or goals, ensuring that all users are kept up to pace.
13. Users may offer feedback and suggestions for changes using the documentation. The dashboard can be improved over time with the help of this feedback loop.
14. User manuals that describe new features and functionalities can ease the transition during updates or dashboard modifications.

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