Power BI Mini Project

1. Introduction:

This report has been prepared as part of the weekly sales analysis for our chain of departmental stores. As the designated Data Analyst, I am responsible for compiling, analyzing, and presenting sales data extracted from the Point of Sale (POS) systems at each store location. Currently, there is no centralized data pipeline or warehouse in place; therefore, weekly sales data is manually extracted by the Senior Assistant, Mr. Suleman, using a dedicated data tool connected to the POS systems. These data files are shared with me every week for the purpose of updating a comprehensive sales dashboard/report, which is then submitted to the CEO for review. The dashboard serves as a vital tool for monitoring performance, identifying trends, and supporting data-driven decisions across all stores.

2. Data Set Overview:

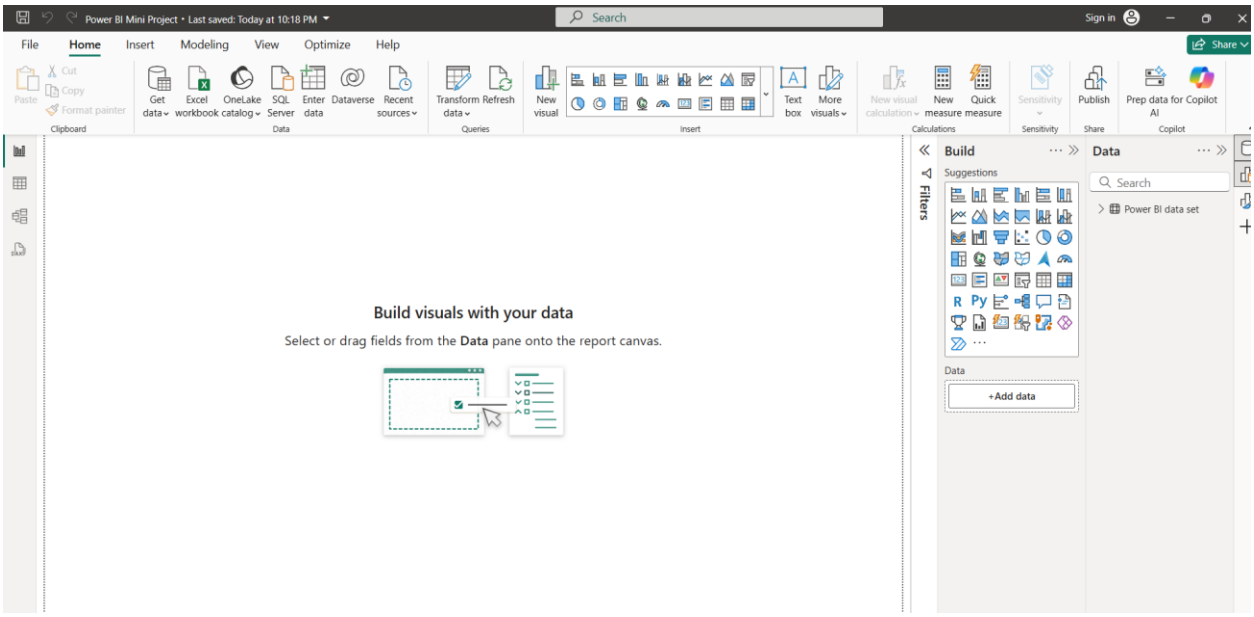
For the preparation of the weekly sales report, data is collected from multiple sources shared by the Senior Assistant, Suleman. The extracted data includes store-level and department-level information along with weekly sales transactions. Each week, new files are added to the specified folders, and these are used to update the dashboard accordingly. The data provided for this report includes:

- **Excel Files:**
  - Store Data Set.csv
  - Department Name.xlsx
- **Folders:**
  - All Data (contains historical weekly sales data)
  - New Week Data (contains the latest weekly data to be added)

3. Methodology

- **Initial Steps in Power BI – Loading the Data**

All required data files and folders have been successfully loaded into Power BI for further transformation and analysis.



- **Transform Data**

Goal: Clean and prepare the data for analysis and reporting.

What to do in Transform Data:

- Open Power Query Editor by clicking **Transform Data** in Power BI.
- Review each loaded table (sales, store, and department).
- Ensure column names are correct and meaningful.
- Remove unnecessary or empty columns/rows.
- Filter out irrelevant data (e.g., blank or test records).
- Set correct **data types** (Date, Number, Text, etc.) for all columns.
- Applied append queries for all weekly sales exclude new week data.

Power BI Mini Project

File | Home | Transform | Add Column | View | Tools | Help

Close & Apply | New Source | Recent Sources | Enter Data | Data source settings | Manage Parameters | Refresh Preview | Properties | Advanced Editor | Manage | Choose Columns | Remove Columns | Keep Rows | Remove Rows | Split Column | Group By | Data Type: Whole Number | Use First Row as Headers | Replace Values | Merge Queries | Append Queries | Combine Files | Text Analytics | Vision | Azure Machine Learning

Close | New Query | Data Sources | Parameters | Query | Manage Columns | Reduce Rows | Sort | Transform | Combine | AI Insights

Queries [97]

2011-01-07 week 1
2011-01-14 week 2
2011-01-21 week 3
2011-01-28 week 4
2011-02-04 week 5
2011-02-11 week 6
2011-02-18 week 7
2011-02-25 week 8
2011-03-04 week 9
2011-03-11 week 10
2011-03-18 week 11
2011-03-25 week 12
2011-04-01 week 13
2011-04-08 week 14
2011-04-15 week 15
2011-04-22 week 16
2011-04-29 week 17
2011-05-06 week 18
2011-05-13 week 19
2011-05-20 week 20
2011-05-27 week 21
2011-06-03 week 22
2011-06-10 week 23
2011-06-17 week 24
2011-06-24 week 25

```
= Table.TransformColumnTypes(#"Promoted Headers",{{"Store", Int64.Type}, {"Dept", Int64.Type}, {"Date", type date}, {"Weekly_Sales", type
```

	Store	Dept	Date	Weekly_Sales	IsHoliday
Valid	100%	100%	100%	100%	100%
Error	0%	0%	0%	0%	0%
Empty	0%	0%	0%	0%	0%
	45 distinct, 0 unique	76 distinct, 1 unique	1 distinct, 0 unique	2915 distinct, 2902 unique	1 distinct, 0 unique
1	1	1	1/7/2011	15984.24	FALSE
2	1	2	1/7/2011	43202.29	FALSE
3	1	3	1/7/2011	15808.15	FALSE
4	1	4	1/7/2011	37947.8	FALSE
5	1	5	1/7/2011	22699.69	FALSE
6	1	6	1/7/2011	1376.15	FALSE
7	1	7	1/7/2011	17516.16	FALSE
8	1	8	1/7/2011	36599.46	FALSE
9	1	9	1/7/2011	16131.88	FALSE
10	1	10	1/7/2011	24500.27	FALSE
11	1	11	1/7/2011	22496.85	FALSE
12	1	12	1/7/2011	8022.82	FALSE
13	1	13	1/7/2011	39764.56	FALSE
14	1	14	1/7/2011	17744.78	FALSE
15	1	16	1/7/2011	5324.47	FALSE
16	1	17	1/7/2011	8582.2	FALSE
17	1	18	1/7/2011	5180.76	FALSE
18	1	19	1/7/2011	955.71	FALSE
19	1	20	1/7/2011	3218.91	FALSE
20	1	21	1/7/2011	7716.16	FALSE
21	1	22	1/7/2011	7742.97	FALSE

Query Settings

PROPERTIES

Name: 2011-01-07 week 1

All Properties

APPLIED STEPS

Source
Navigation
Imported CSV
Promoted Headers
Changed Type

5 COLUMNS, 999+ ROWS | Column profiling based on entire data set | PREVIEW DOWNLOADED ON SATURDAY

Power BI Mini Project

File | Home | Transform | Add Column | View | Tools | Help

Close & Apply | New Source | Recent Sources | Enter Data | Data source settings | Manage Parameters | Refresh Preview | Properties | Advanced Editor | Manage | Choose Columns | Remove Columns | Keep Rows | Remove Rows | Split Column | Group By | Data Type: Whole Number | Use First Row as Headers | Replace Values | Merge Queries | Append Queries | Combine Files | Text Analytics | Vision | Azure Machine Learning

Close | New Query | Data Sources | Parameters | Query | Manage Columns | Reduce Rows | Sort | Transform | Combine | AI Insights

Queries [97]

2012-05-18 week 72
2012-05-25 week 73
2012-06-01 week 74
2012-06-08 week 75
2012-06-15 week 76
2012-06-22 week 77
2012-06-29 week 78
2012-07-06 week 79
2012-07-13 week 80
2012-07-20 week 81
2012-07-27 week 82
2012-08-03 week 83
2012-08-10 week 84
2012-08-17 week 85
2012-08-24 week 86
2012-08-31 week 87
2012-09-07 week 88
2012-09-14 week 89
2012-09-21 week 90
2012-09-28 week 91
2012-10-05 week 92
2012-10-12 week 93
2012-10-19 week 94
Department
newly_week data
stores data-set

```
= Table.TransformColumnTypes(#"Promoted Headers",{{"Store", Int64.Type}, {"Store Name", type text}, {"Manager Name", type text}})
```

	Store	Store Name	Manager Name
Valid	100%	100%	100%
Error	0%	0%	0%
Empty	0%	0%	0%
	45 distinct, 45 unique	45 distinct, 45 unique	45 distinct, 45 unique
1	1	Lakeview Mart	William Johnville
2	2	Parkdale Mart	Johnny Thomson
3	3	Cedarville Mart	Matthew Davidson
4	4	Meadowbrook Mart	Barb Martinez
5	5	Pinebrook Mart	Jose Robin
6	6	Star City	Donna Jackson
7	7	Fairview Mart	Emily Miller
8	8	Crownpoint Mart	Karen White
9	9	Hillcrest Mart	David Anderson
10	10	Coastline Mart	Robert Wilson
11	11	Elmwood Mart	Daniel Jones
12	12	Bridgetown Mart	Rebecca Taylor
13	13	Maplewood Mart	Laura Thompson
14	14	Georgetown Mart	Mark Garcia
15	15	Springfield Mart	Elizabeth Brown
16	16	Sunnyvale Mart	Jennifer Williams
17	17	Kingston Mart	Sharon Smith
18	18	Astoria Mart	Susan Martinez
19	19	Brookfield Mart	Rachel Moore
20	20	Summerfield Mart	Richard Harris
21	21	Cliffside Mart	Patricia Johnson

Query Settings

PROPERTIES

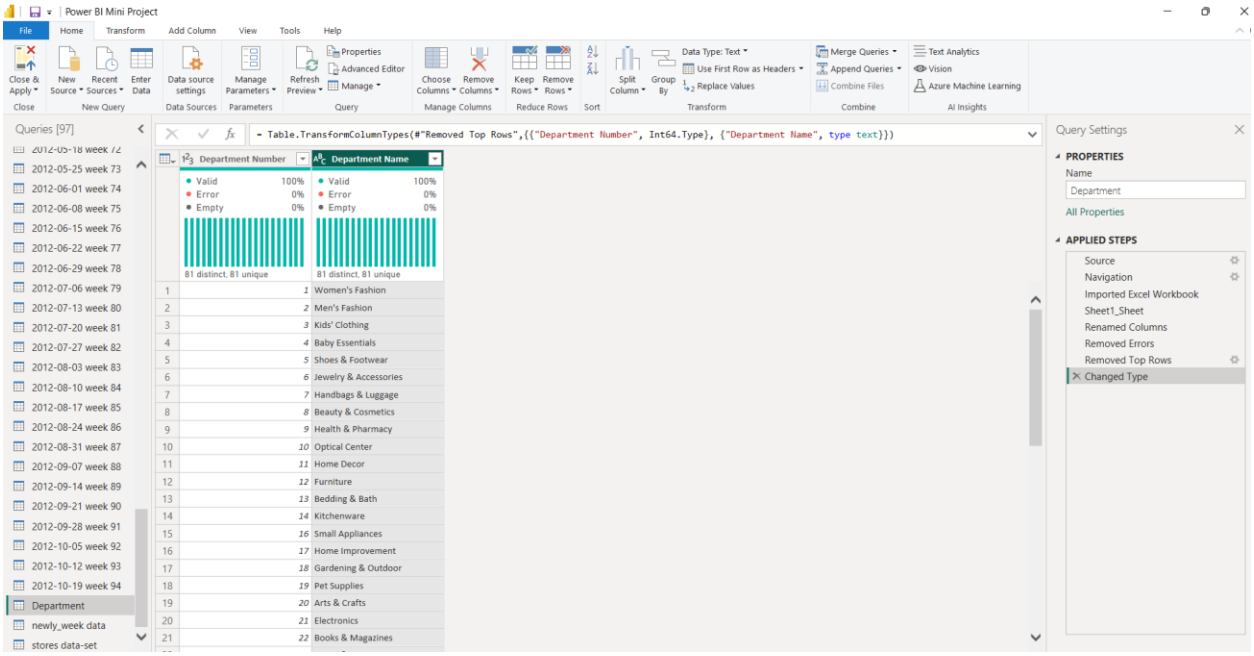
Name: stores data-set

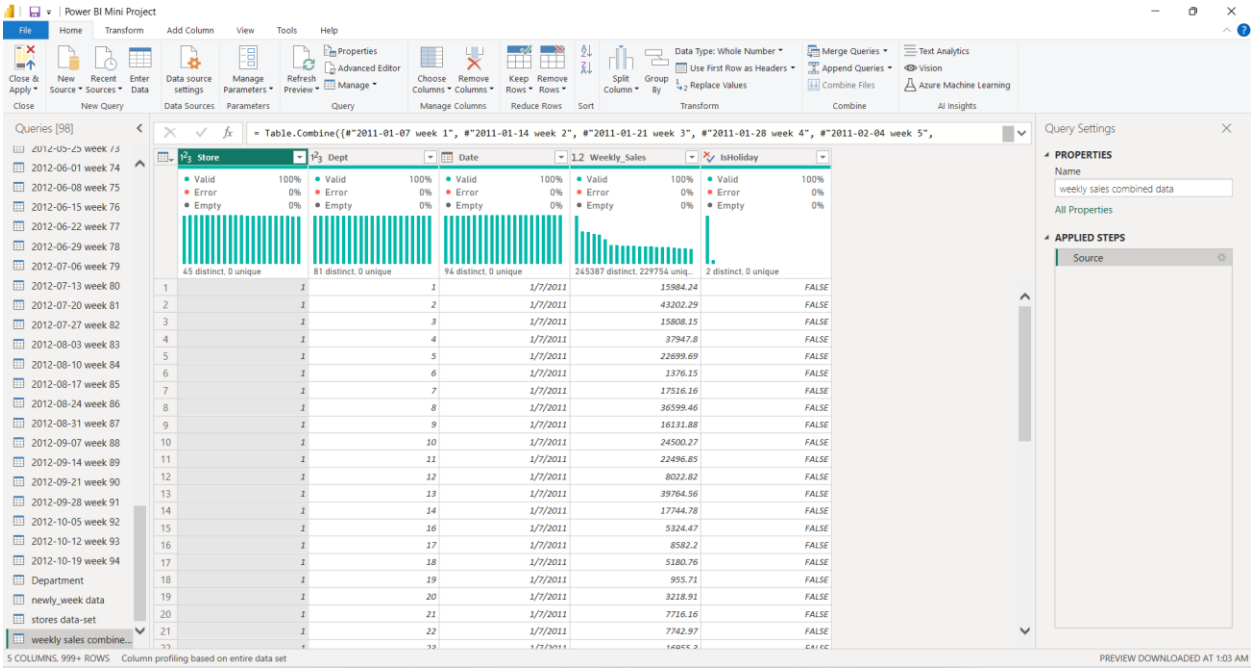
All Properties

APPLIED STEPS

Source
Navigation
Imported CSV
Promoted Headers
Changed Type

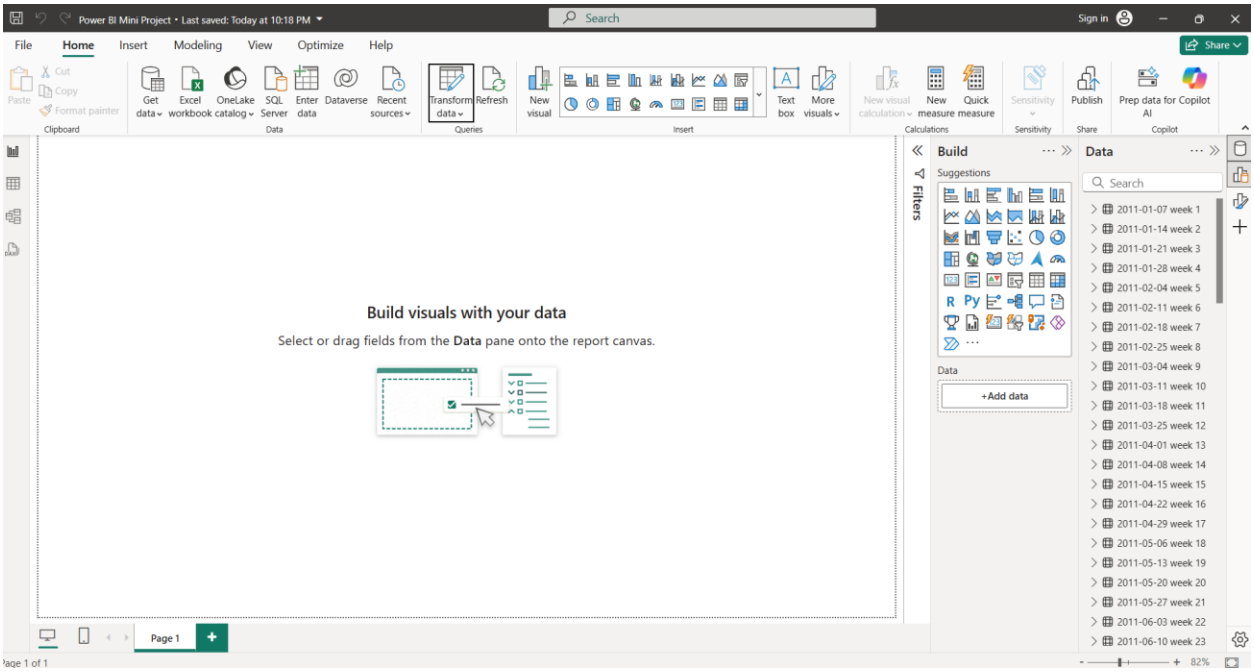
3 COLUMNS, 45 ROWS | Column profiling based on entire data set | PREVIEW DOWNLOADED AT 11:49 PI

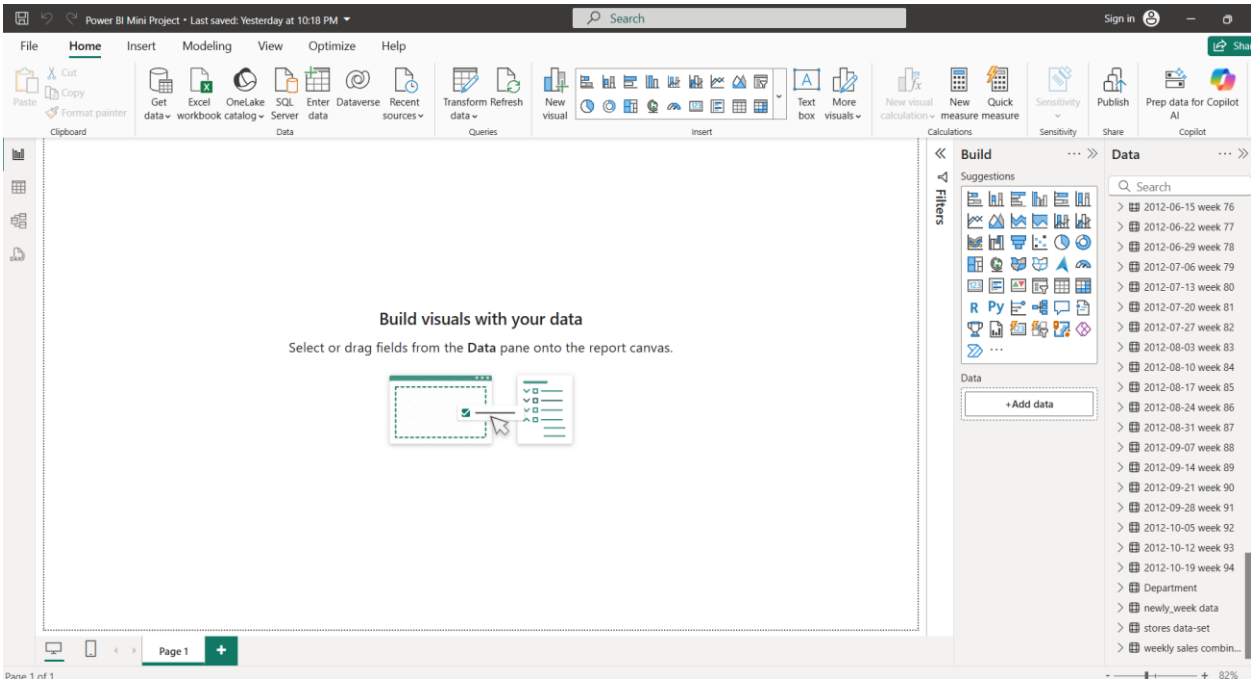

Power BI Mini Project
File
Home
Transform
Add Column
View
Tools
Help
Queries [97]
= Table.TransformColumnTypes(#"Removed Top Rows",{{"Department Number", Int64.Type}, {"Department Name", type text}})
Department Number
Department Name
Valid 100%
Error 0%
Empty 0%
81 distinct, 81 unique
1 Women's Fashion
2 Men's Fashion
3 Kids' Clothing
4 Baby Essentials
5 Shoes & Footwear
6 Jewelry & Accessories
7 Handbags & Luggage
8 Beauty & Cosmetics
9 Health & Pharmacy
10 Optical Center
11 Home Decor
12 Furniture
13 Bedding & Bath
14 Kitchenware
15 Small Appliances
16 Home Improvement
17 Gardening & Outdoor
18 Pet Supplies
19 Arts & Crafts
20 Electronics
21 Books & Magazines
Department
newly_week data
stores data-set
Query Settings
PROPERTIES
Name
Department
All Properties
APPLIED STEPS
Source
Navigation
Imported Excel Workbook
Sheet1_Sheet
Renamed Columns
Removed Errors
Removed Top Rows
Changed Type


Power BI Mini Project
File
Home
Transform
Add Column
View
Tools
Help
Queries [98]
= Table.Combine({#"2011-01-07 week 1", #"2011-01-14 week 2", #"2011-01-21 week 3", #"2011-01-28 week 4", #"2011-02-04 week 5",
Store
Dept
Date
Weekly_Sales
IsHoliday
Valid 100%
Error 0%
Empty 0%
45 distinct, 0 unique
81 distinct, 0 unique
94 distinct, 0 unique
245387 distinct, 229754 uniq...
2 distinct, 0 unique
1 1 1/7/2011 15984.24 FALSE
1 2 1/7/2011 43202.29 FALSE
1 3 1/7/2011 15808.15 FALSE
1 4 1/7/2011 37947.8 FALSE
1 5 1/7/2011 22699.69 FALSE
1 6 1/7/2011 1376.15 FALSE
1 7 1/7/2011 17516.16 FALSE
1 8 1/7/2011 36599.46 FALSE
1 9 1/7/2011 16131.88 FALSE
1 10 1/7/2011 24500.27 FALSE
1 11 1/7/2011 22496.85 FALSE
1 12 1/7/2011 8022.82 FALSE
1 13 1/7/2011 39764.56 FALSE
1 14 1/7/2011 17744.78 FALSE
1 16 1/7/2011 5324.47 FALSE
1 17 1/7/2011 8582.2 FALSE
1 18 1/7/2011 5180.76 FALSE
1 19 1/7/2011 955.71 FALSE
1 20 1/7/2011 3218.91 FALSE
1 21 1/7/2011 7716.16 FALSE
1 22 1/7/2011 7742.97 FALSE
Department
newly_week data
stores data-set
weekly sales combine...
Query Settings
PROPERTIES
Name
weekly sales combined data
All Properties
APPLIED STEPS
Source
5 COLUMNS, 999+ ROWS
Column profiling based on entire data set
PREVIEW DOWNLOADED AT 1:03 AM

- **<u>Close & Apply Transformed Data</u>**

Goal: Load the cleaned and structured data into Power BI for modeling and analysis.





- **Build Data Model (Relationships)**

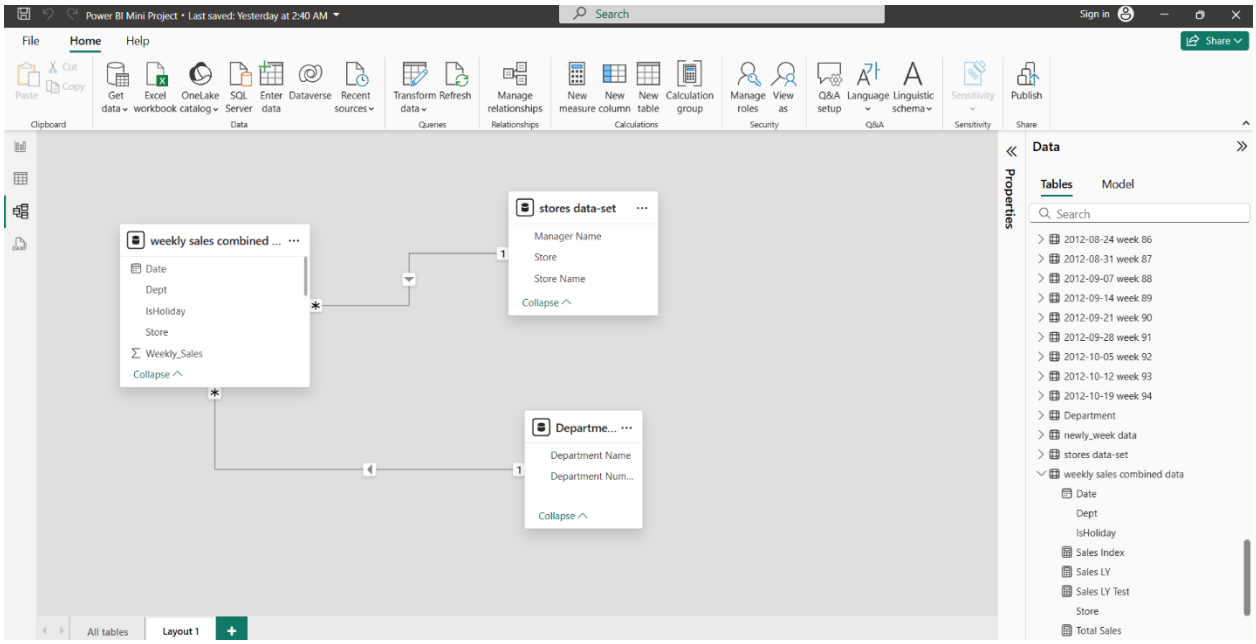
Goal: Establish logical relationships between tables to enable meaningful and dynamic analysis in Power BI.

Summary:
After appending all weekly sales files into a single consolidated fact table (Sales_All), a data model was constructed by defining relationships between the fact table and the relevant dimension tables. Specifically:

Sales_All was connected to the Store Info table using the StoreID field.

Sales_All was connected to the Department Info table using the DepartmentID field.

These one-to-many relationships allow for seamless filtering and aggregation by store and department in visuals and calculations.

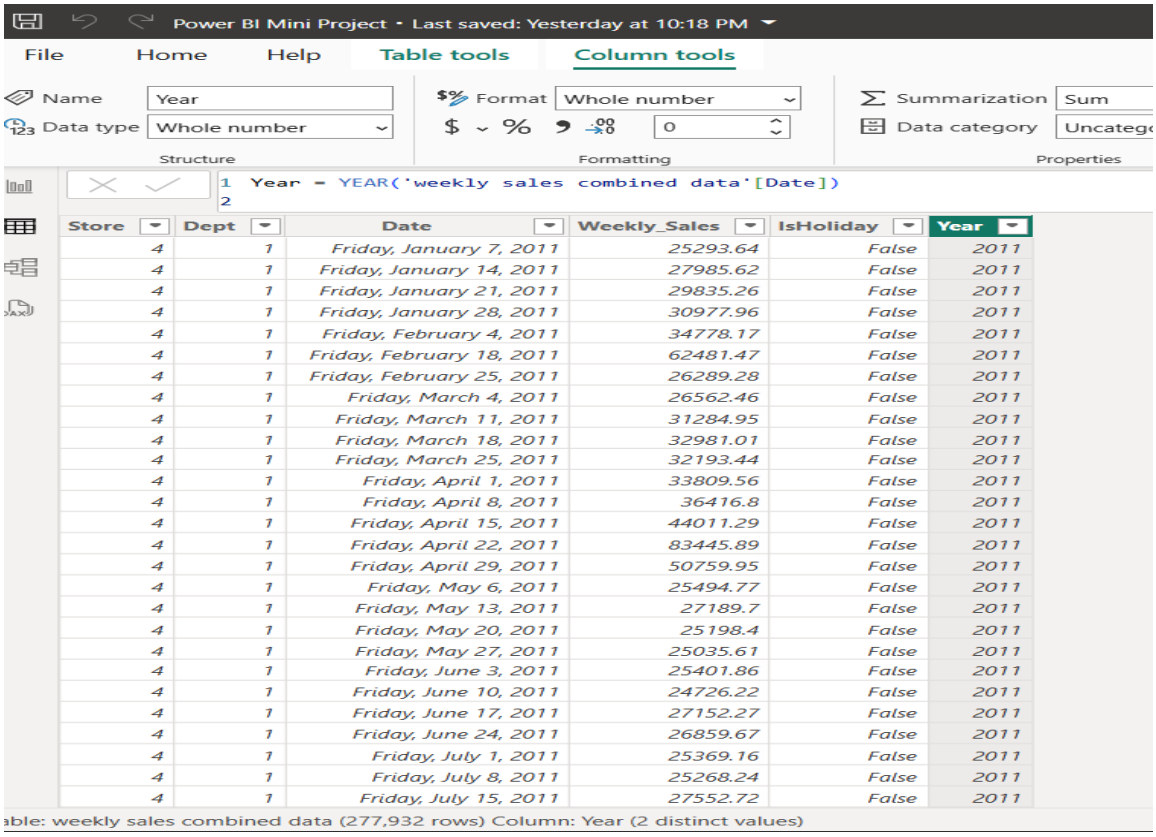


Question No.1

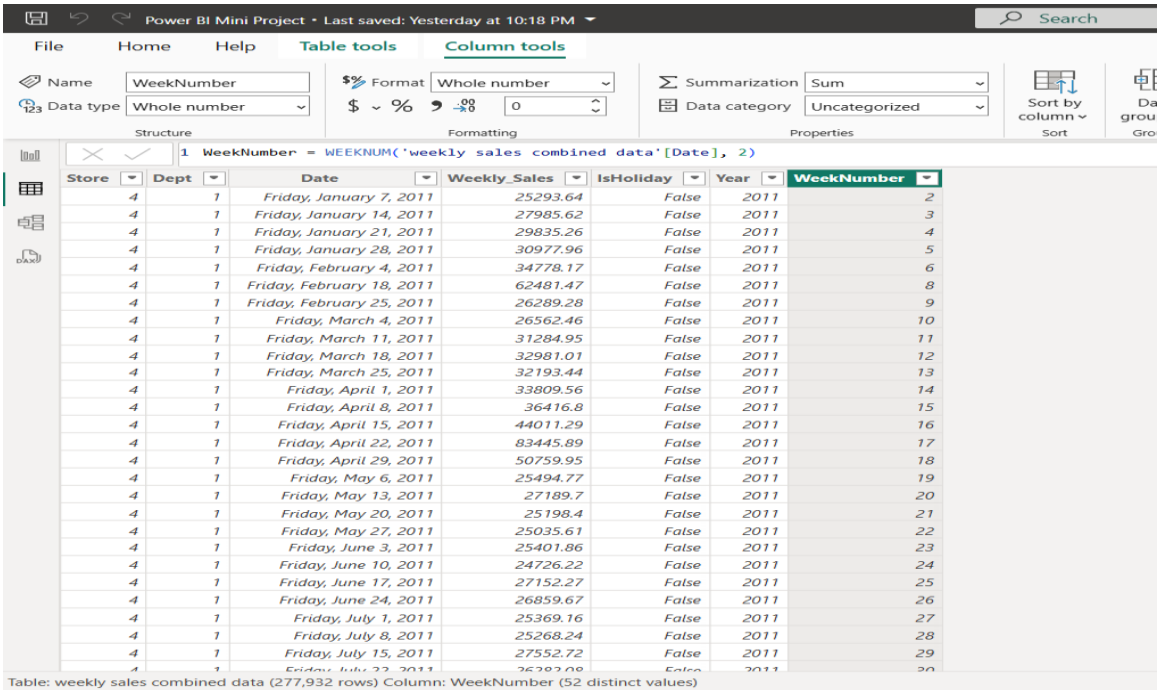
1. The CEO (Sumera) has told you that it is common practice to compare weekly data to the year before. For e.g. Sumera wants to see how well Store 3, Dept 1 did in Week 20 this year as compared to Week 20 last year. She also wants to see bigger picture by store and department.

DAX Columns

STEP 1: Create Column of year and week number

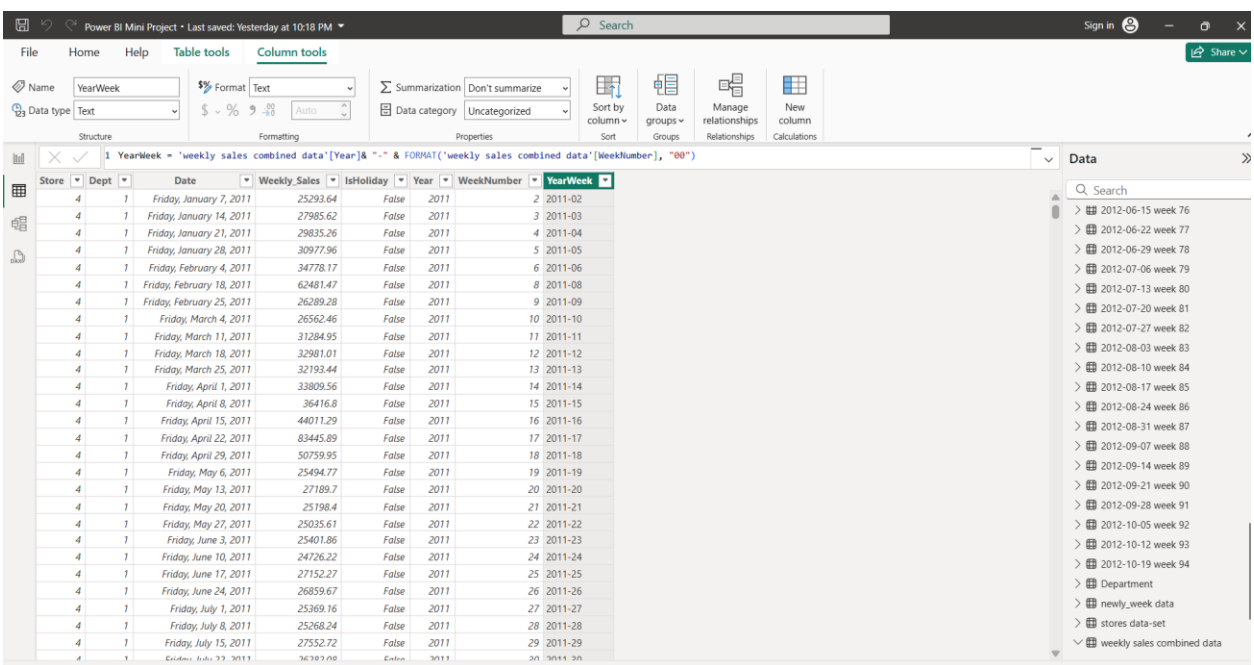


Store	Dept	Date	Weekly_Sales	IsHoliday	Year
4	1	Friday, January 7, 2011	25293.64	False	2011
4	1	Friday, January 14, 2011	27985.62	False	2011
4	1	Friday, January 21, 2011	29835.26	False	2011
4	1	Friday, January 28, 2011	30977.96	False	2011
4	1	Friday, February 4, 2011	34778.17	False	2011
4	1	Friday, February 18, 2011	62481.47	False	2011
4	1	Friday, February 25, 2011	26289.28	False	2011
4	1	Friday, March 4, 2011	26562.46	False	2011
4	1	Friday, March 11, 2011	31284.95	False	2011
4	1	Friday, March 18, 2011	32981.01	False	2011
4	1	Friday, March 25, 2011	32193.44	False	2011
4	1	Friday, April 1, 2011	33809.56	False	2011
4	1	Friday, April 8, 2011	36416.8	False	2011
4	1	Friday, April 15, 2011	44011.29	False	2011
4	1	Friday, April 22, 2011	83445.89	False	2011
4	1	Friday, April 29, 2011	50759.95	False	2011
4	1	Friday, May 6, 2011	25494.77	False	2011
4	1	Friday, May 13, 2011	27189.7	False	2011
4	1	Friday, May 20, 2011	25198.4	False	2011
4	1	Friday, May 27, 2011	25035.61	False	2011
4	1	Friday, June 3, 2011	25401.86	False	2011
4	1	Friday, June 10, 2011	24726.22	False	2011
4	1	Friday, June 17, 2011	27152.27	False	2011
4	1	Friday, June 24, 2011	26859.67	False	2011
4	1	Friday, July 1, 2011	25369.16	False	2011
4	1	Friday, July 8, 2011	25268.24	False	2011
4	1	Friday, July 15, 2011	27552.72	False	2011



Store	Dept	Date	Weekly_Sales	IsHoliday	Year	WeekNumber
4	1	Friday, January 7, 2011	25293.64	False	2011	2
4	1	Friday, January 14, 2011	27985.62	False	2011	3
4	1	Friday, January 21, 2011	29835.26	False	2011	4
4	1	Friday, January 28, 2011	30977.96	False	2011	5
4	1	Friday, February 4, 2011	34778.17	False	2011	6
4	1	Friday, February 18, 2011	62481.47	False	2011	8
4	1	Friday, February 25, 2011	26289.28	False	2011	9
4	1	Friday, March 4, 2011	26562.46	False	2011	10
4	1	Friday, March 11, 2011	31284.95	False	2011	11
4	1	Friday, March 18, 2011	32981.01	False	2011	12
4	1	Friday, March 25, 2011	32193.44	False	2011	13
4	1	Friday, April 1, 2011	33809.56	False	2011	14
4	1	Friday, April 8, 2011	36416.8	False	2011	15
4	1	Friday, April 15, 2011	44011.29	False	2011	16
4	1	Friday, April 22, 2011	83445.89	False	2011	17
4	1	Friday, April 29, 2011	50759.95	False	2011	18
4	1	Friday, May 6, 2011	25494.77	False	2011	19
4	1	Friday, May 13, 2011	27189.7	False	2011	20
4	1	Friday, May 20, 2011	25198.4	False	2011	21
4	1	Friday, May 27, 2011	25035.61	False	2011	22
4	1	Friday, June 3, 2011	25401.86	False	2011	23
4	1	Friday, June 10, 2011	24726.22	False	2011	24
4	1	Friday, June 17, 2011	27152.27	False	2011	25
4	1	Friday, June 24, 2011	26859.67	False	2011	26
4	1	Friday, July 1, 2011	25369.16	False	2011	27
4	1	Friday, July 8, 2011	25268.24	False	2011	28
4	1	Friday, July 15, 2011	27552.72	False	2011	29

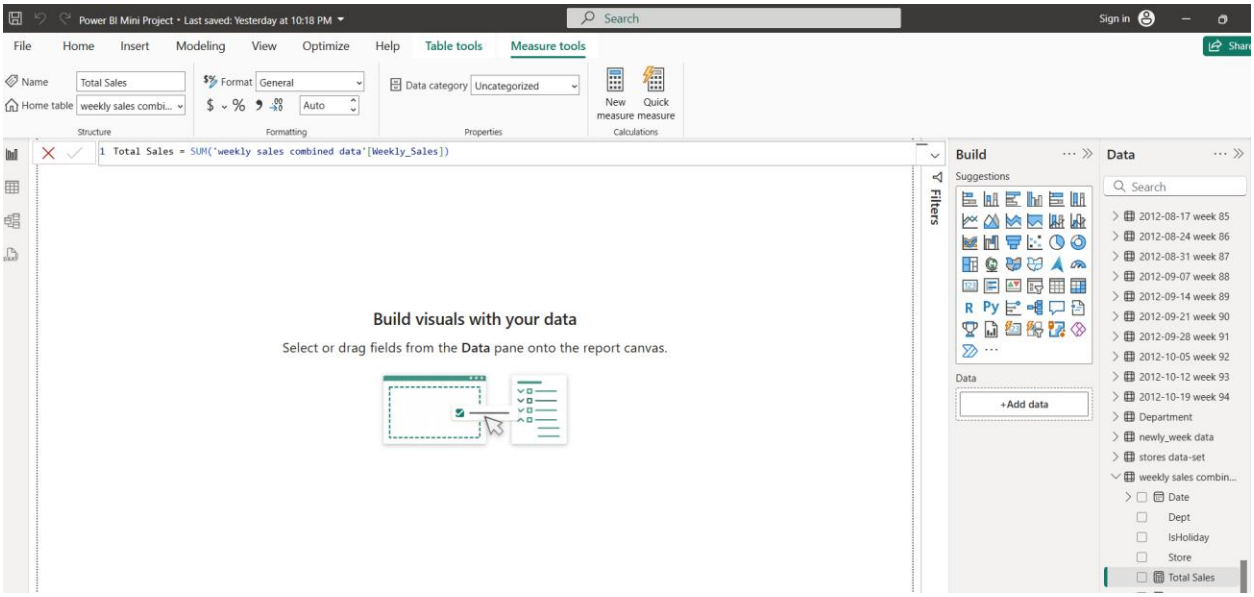
STEP 2: Combine both new col



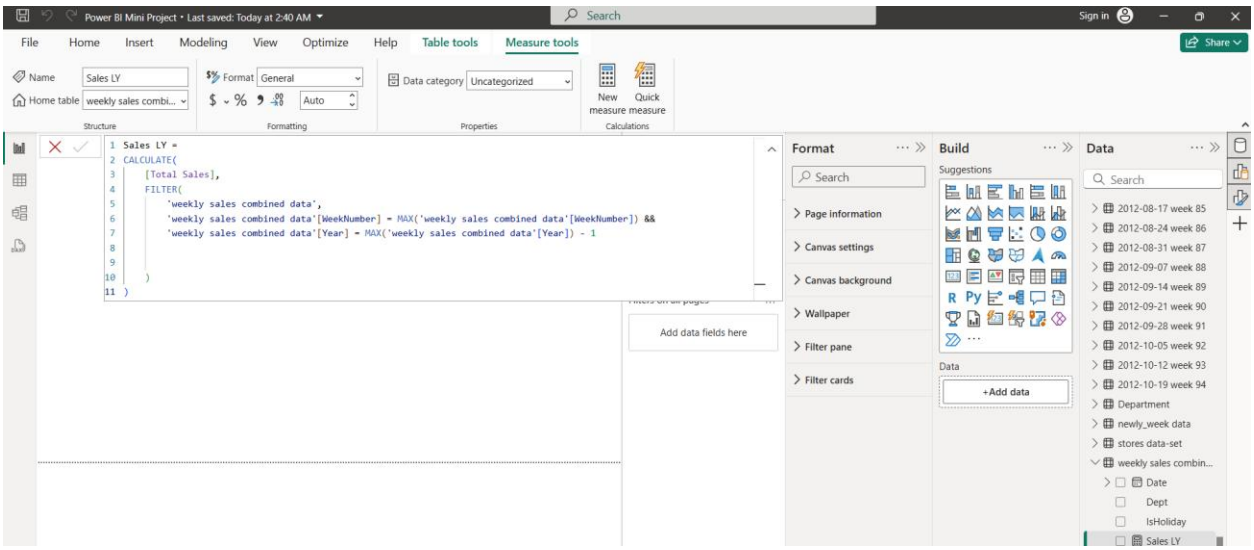
Store	Dept	Date	Weekly_Sales	IsHoliday	Year	WeekNumber	YearWeek
4	1	Friday, January 7, 2011	25293.64	False	2011	2	2011-02
4	1	Friday, January 14, 2011	27985.62	False	2011	3	2011-03
4	1	Friday, January 21, 2011	29835.26	False	2011	4	2011-04
4	1	Friday, January 28, 2011	30977.96	False	2011	5	2011-05
4	1	Friday, February 4, 2011	34778.17	False	2011	6	2011-06
4	1	Friday, February 18, 2011	62481.47	False	2011	8	2011-08
4	1	Friday, February 25, 2011	26289.28	False	2011	9	2011-09
4	1	Friday, March 4, 2011	26562.46	False	2011	10	2011-10
4	1	Friday, March 11, 2011	31284.95	False	2011	11	2011-11
4	1	Friday, March 18, 2011	32981.01	False	2011	12	2011-12
4	1	Friday, March 25, 2011	32193.44	False	2011	13	2011-13
4	1	Friday, April 1, 2011	33809.56	False	2011	14	2011-14
4	1	Friday, April 8, 2011	36416.8	False	2011	15	2011-15
4	1	Friday, April 15, 2011	44011.29	False	2011	16	2011-16
4	1	Friday, April 22, 2011	83445.89	False	2011	17	2011-17
4	1	Friday, April 29, 2011	50759.95	False	2011	18	2011-18
4	1	Friday, May 6, 2011	25494.77	False	2011	19	2011-19
4	1	Friday, May 13, 2011	27189.7	False	2011	20	2011-20
4	1	Friday, May 20, 2011	25198.4	False	2011	21	2011-21
4	1	Friday, May 27, 2011	25035.61	False	2011	22	2011-22
4	1	Friday, June 3, 2011	25401.86	False	2011	23	2011-23
4	1	Friday, June 10, 2011	24726.22	False	2011	24	2011-24
4	1	Friday, June 17, 2011	27152.27	False	2011	25	2011-25
4	1	Friday, June 24, 2011	26859.67	False	2011	26	2011-26
4	1	Friday, July 1, 2011	25369.16	False	2011	27	2011-27
4	1	Friday, July 8, 2011	25268.24	False	2011	28	2011-28
4	1	Friday, July 15, 2011	27552.72	False	2011	29	2011-29

DAX Measure steps

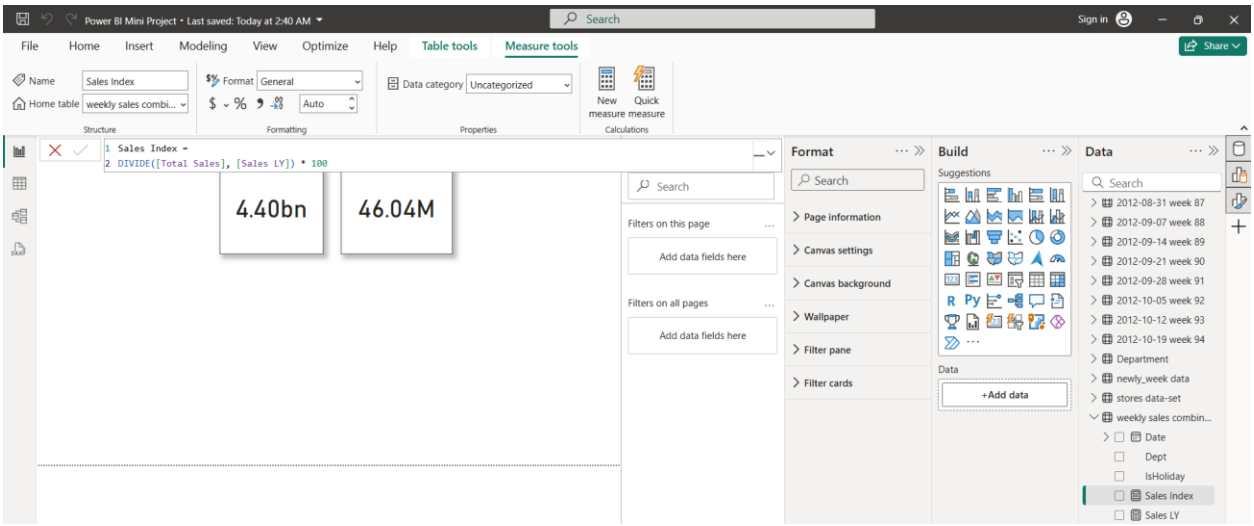
STEP 3 Total Sales

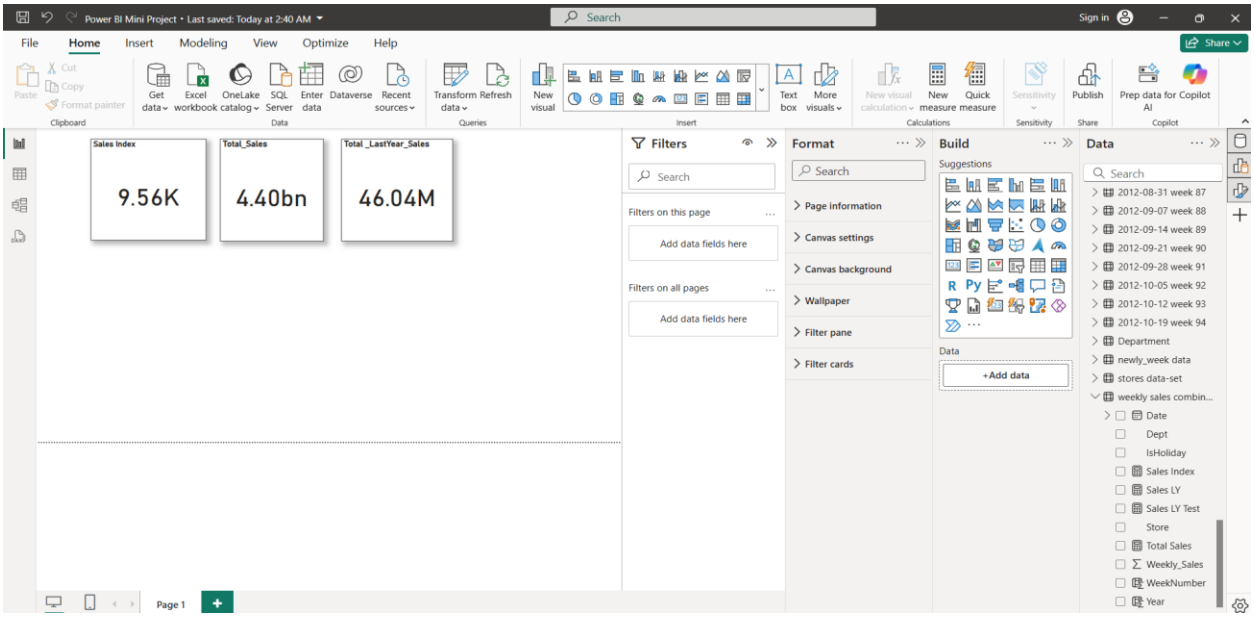


STEP 4 Sales Last Year (LY)

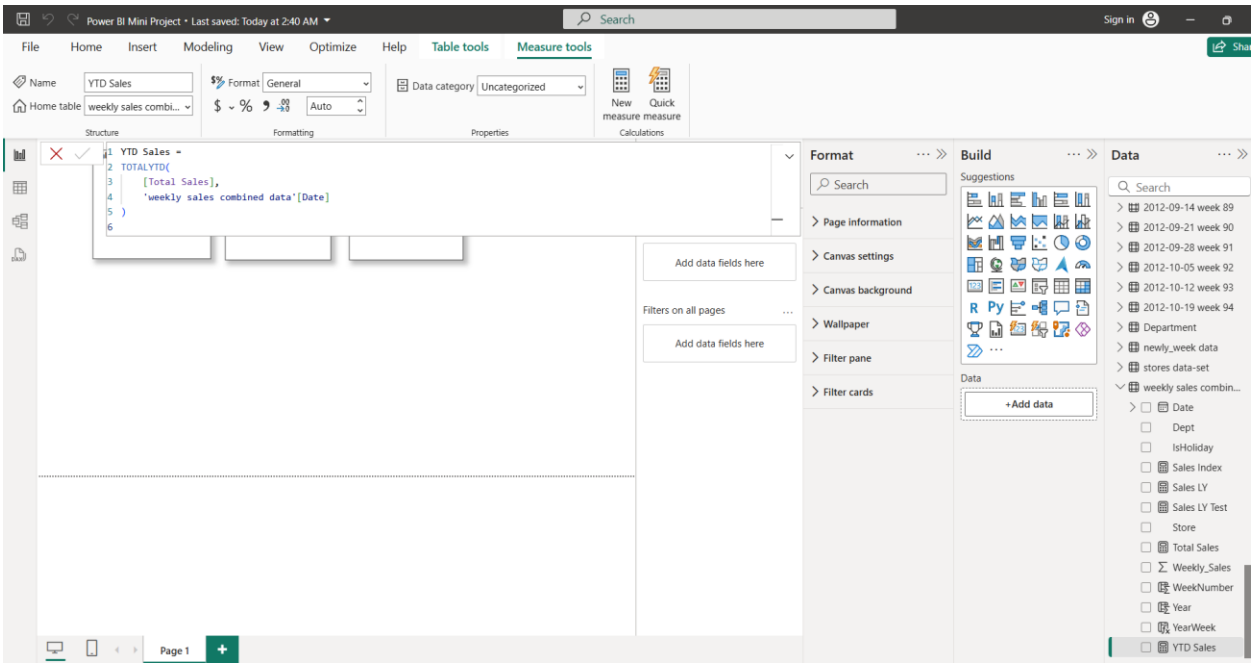


STEP 5 Sales Index

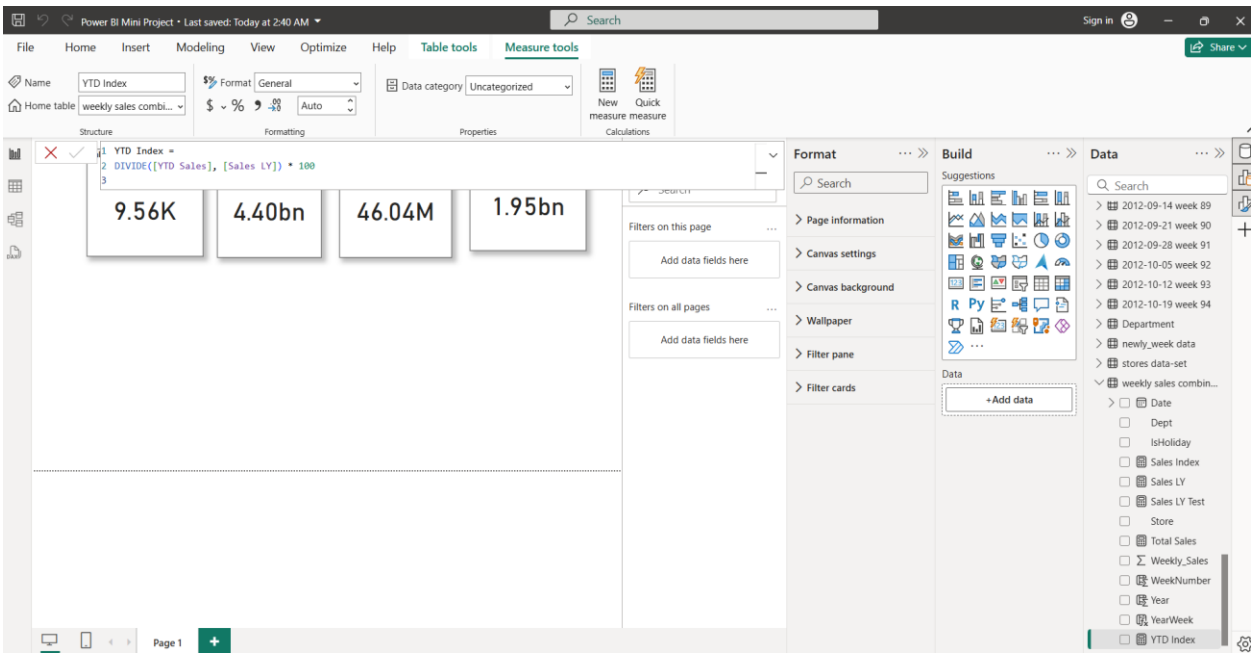




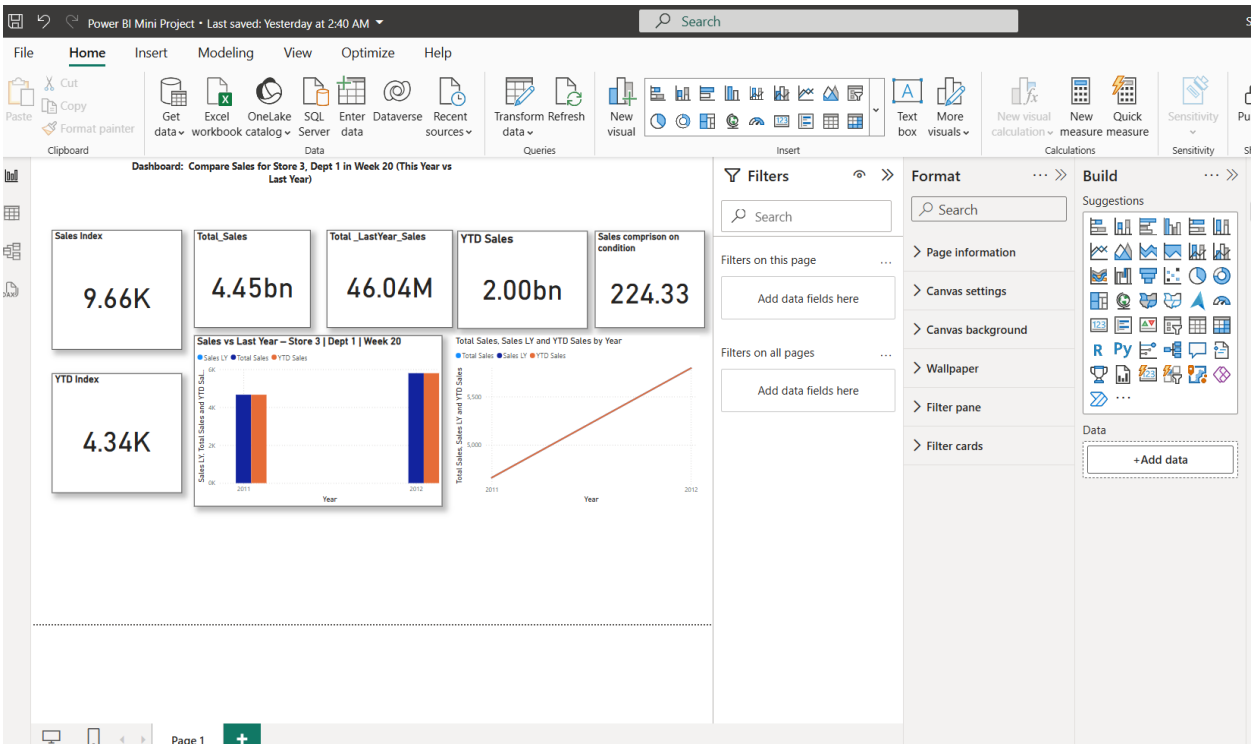
Current Sales



YTD Index



Compare Sales for Store 3, Dept 1 in Week 20 (This Year vs Last Year)



Weekly Sales Comparison Summary – Week 20, Store 3, Department 1

This report presents a year-over-year sales comparison for **Store 3**, **Department 1** during **Week 20** of both **2011** and **2012**, in response to the CEO's request to monitor performance at a weekly level.

📊 Sales Comparison Table

Year	Week	Store	Department	Total Sales
2011	20	3	1	4,660.39
2012	20	3	1	5,794.32

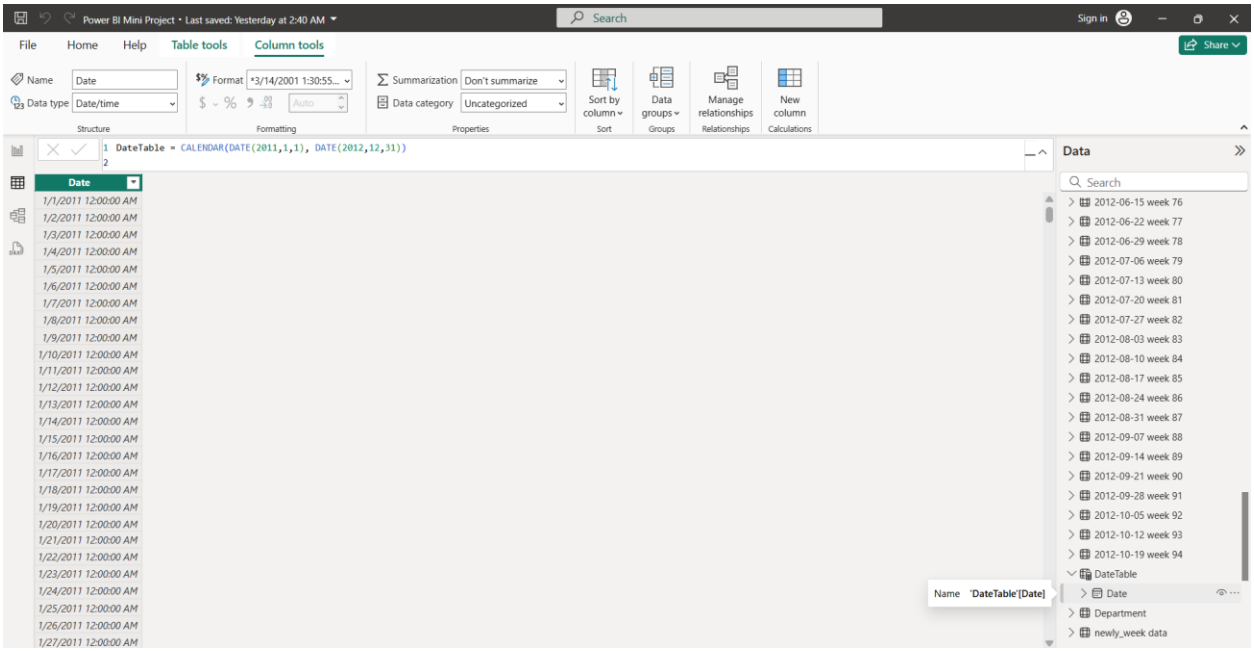
📈 Key Insight:

- There was a **sales increase of 1,133.93** from 2011 to 2012, representing a **24.32% year-over-year growth** for Store 3, Department 1 in Week 20.
- The **Sales Index** value of **224.33** in 2012 reflects the weighted performance of Store 3, Department 1 in Week 20 relative to a baseline (typically 100 value)

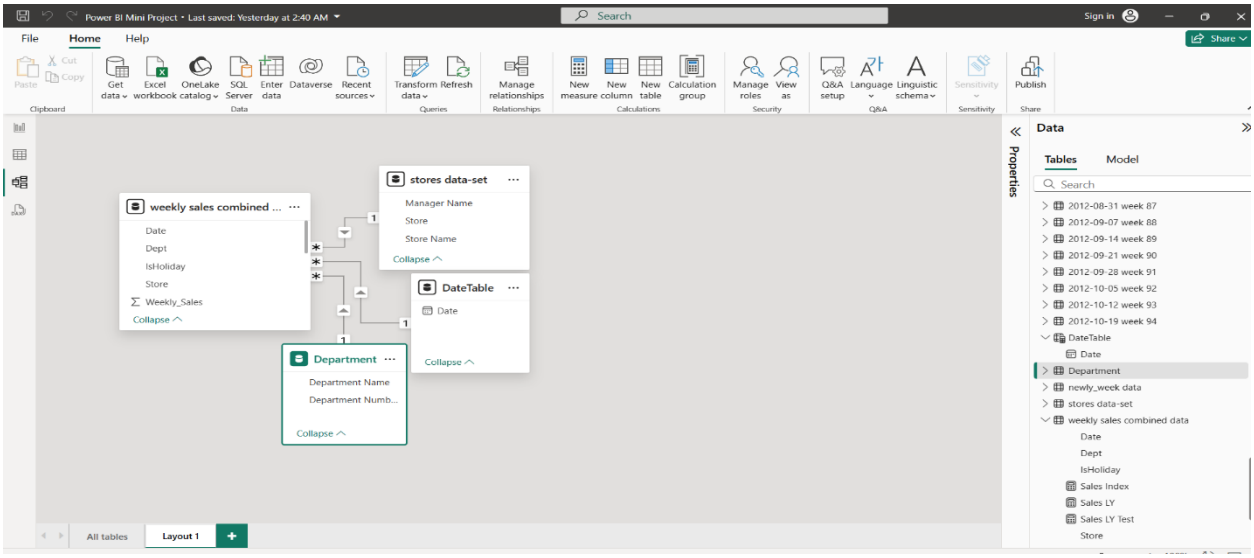
Question No.2 &3

1. Folder named All data contains all data till the current week
2. Sumera wants to see big picture summary, for eg top 10 stores in the current week, top 10 depts in the current week. Assume our current week is 19th to 25th Oct 2012

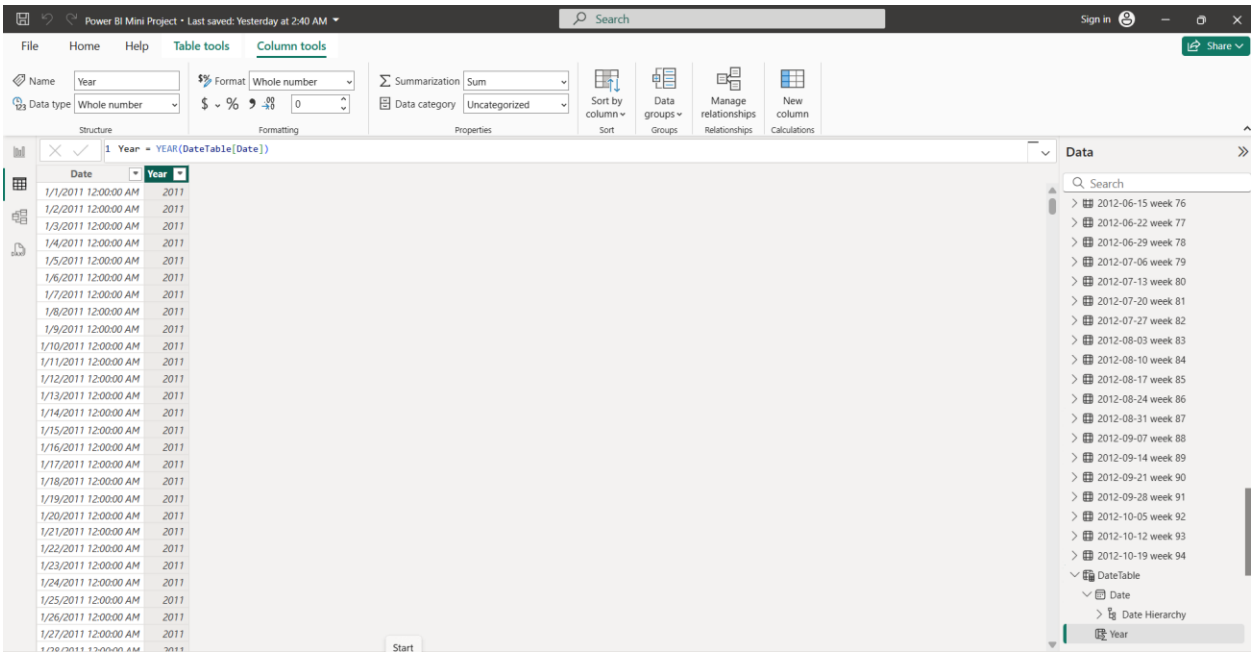
Create the Date Table



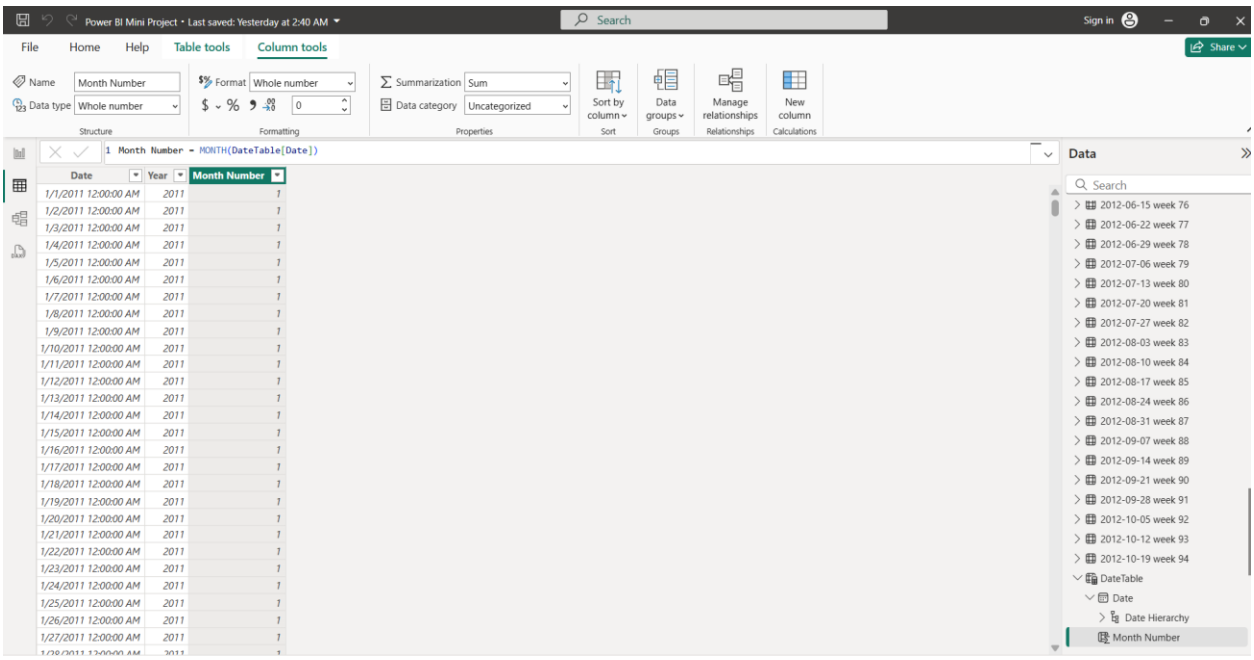
Relate the Table Model View:



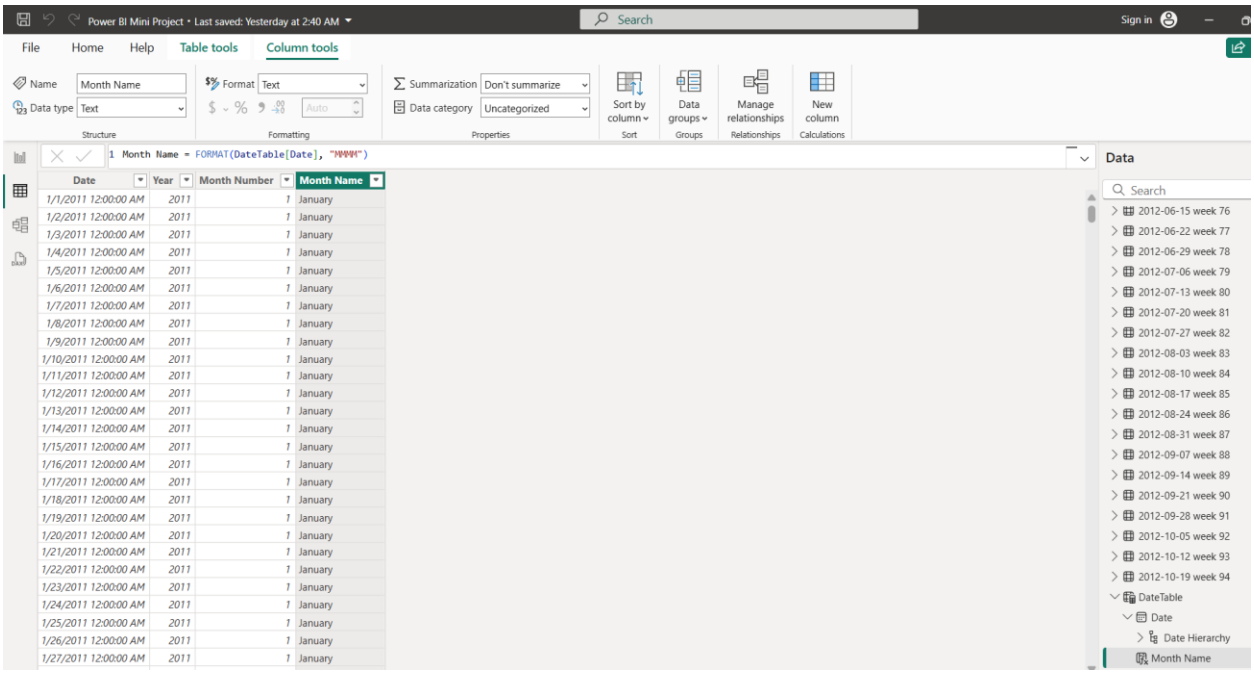
Column Year



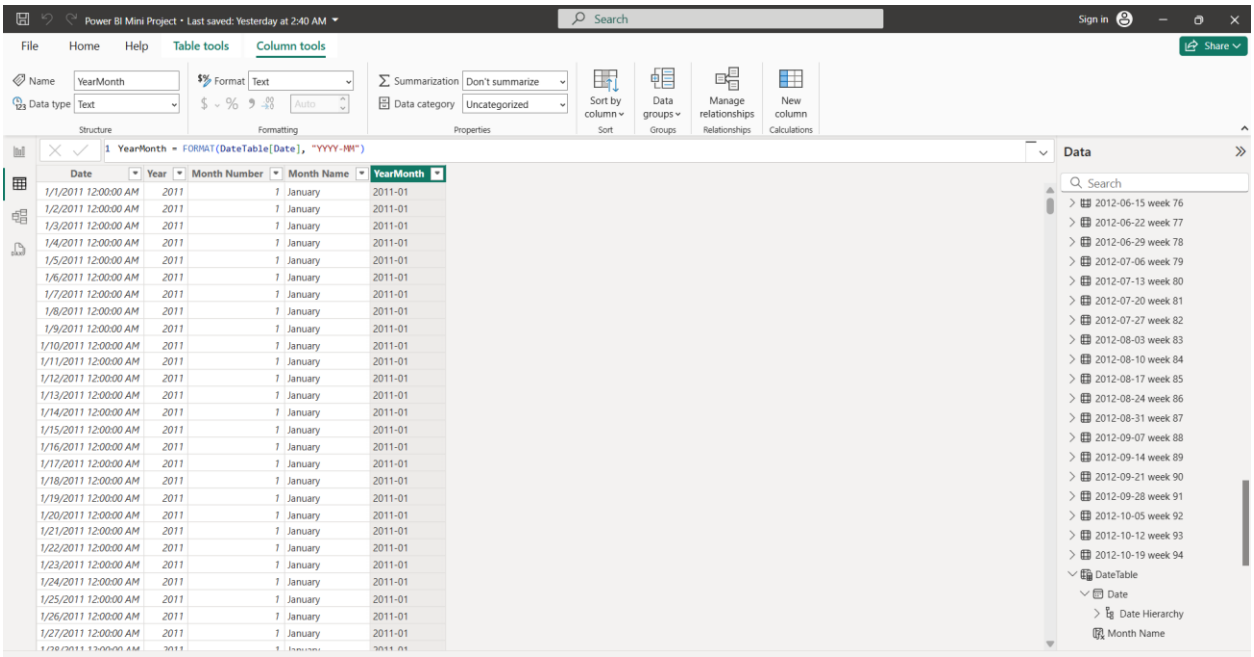
Month Number



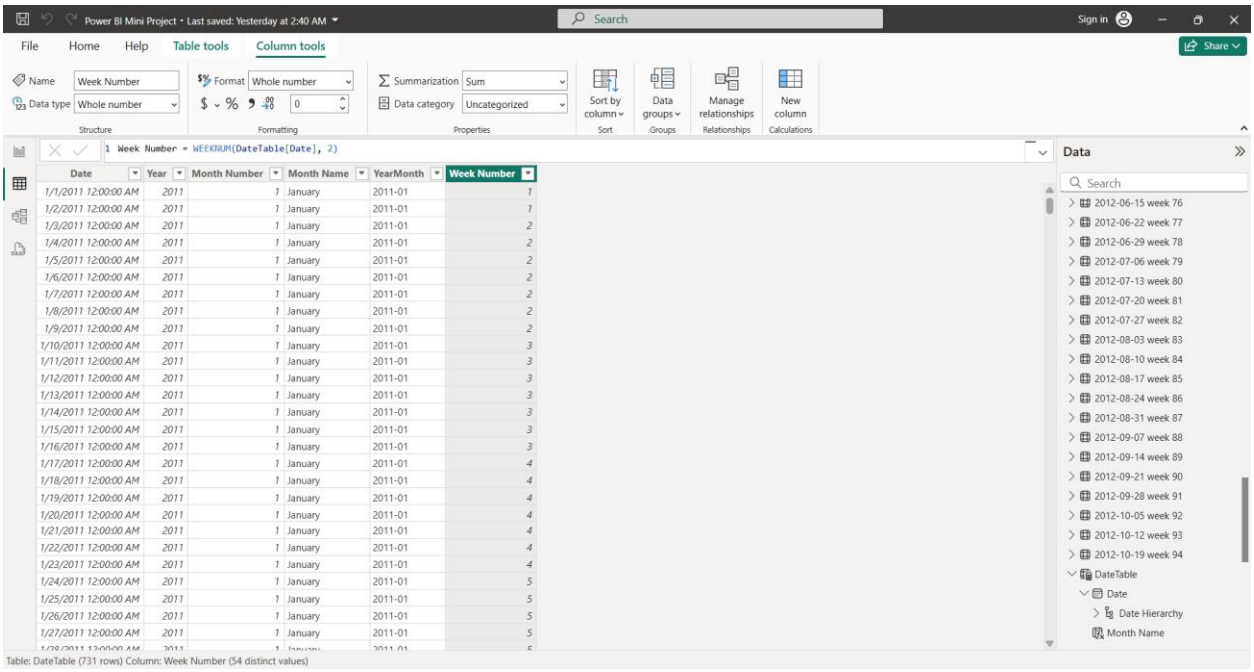
Month Name



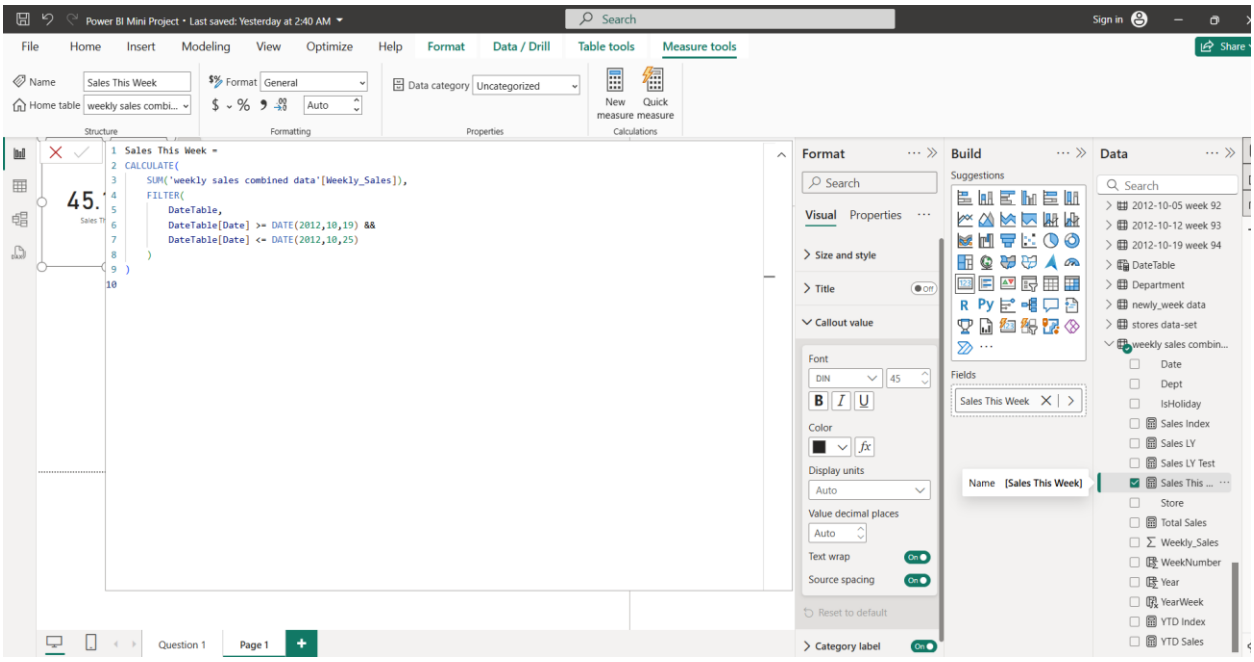
Month Year

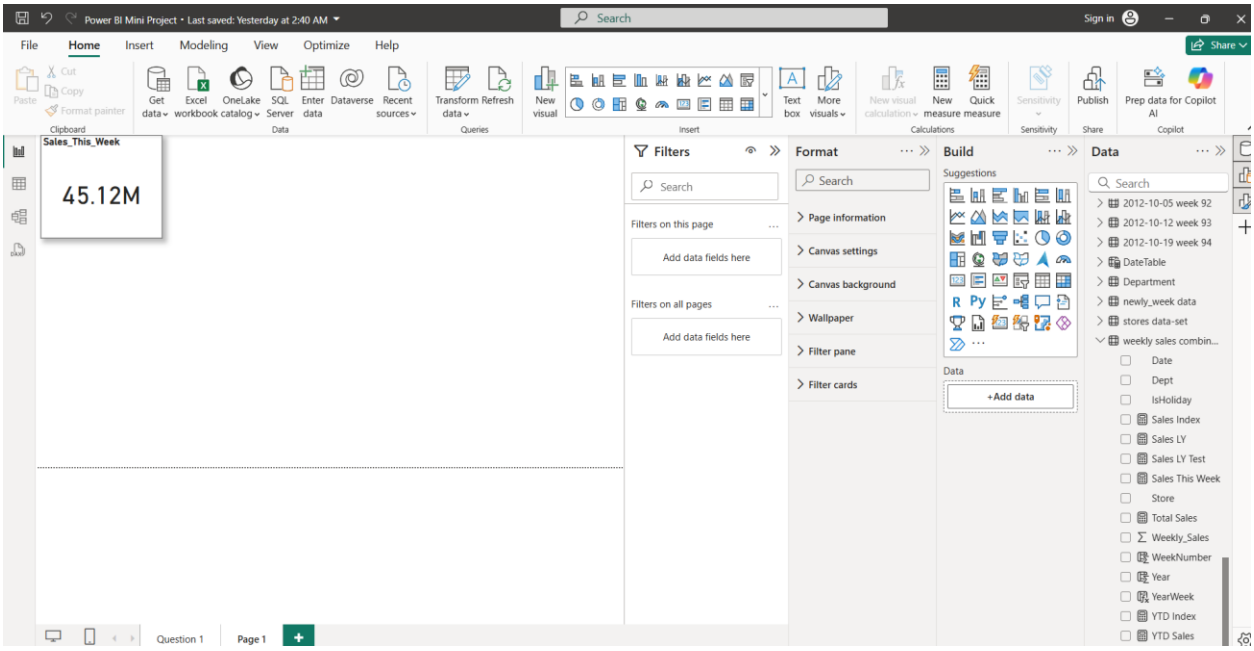


Week Number

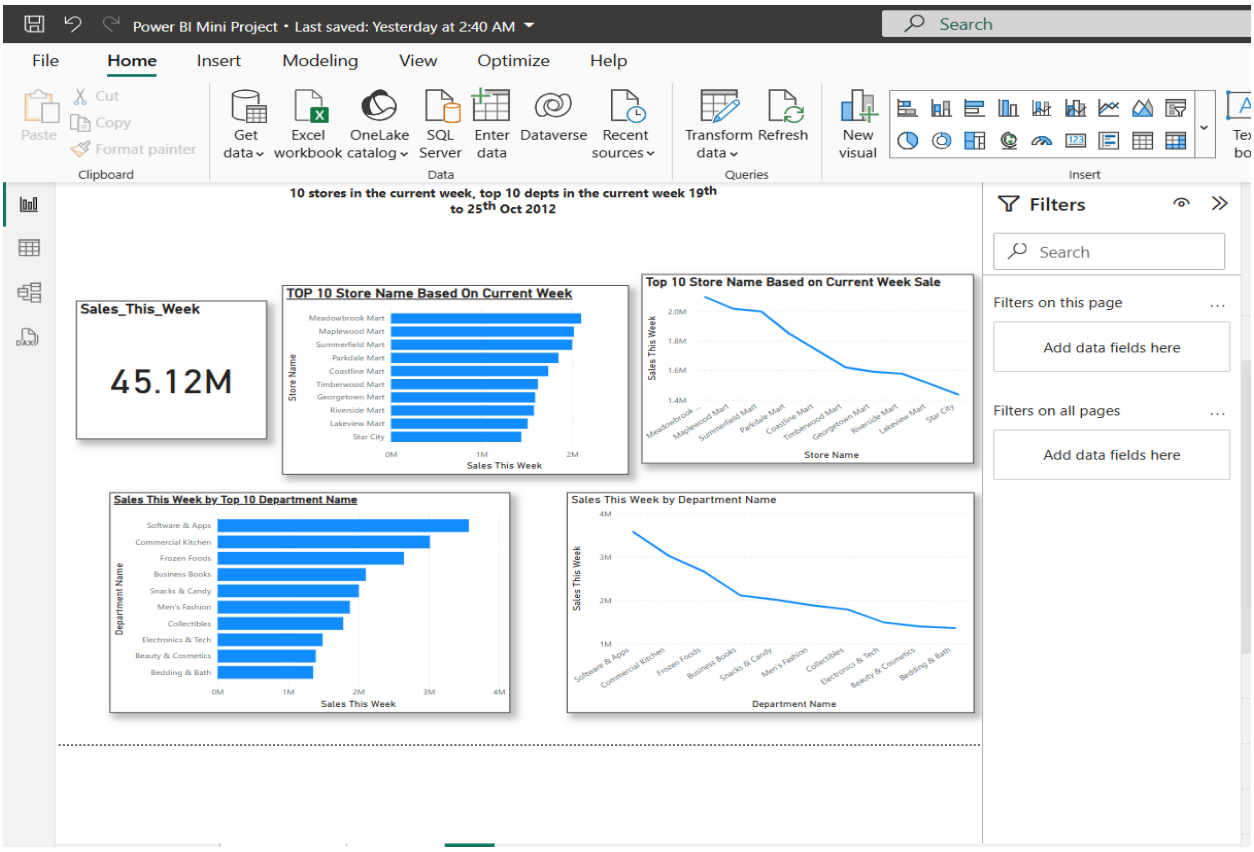


Create the “Sales This Week” Measure





Create Top 10 Stores and Top 10 Departments Visuals



Top 10 Stores and Departments – Sales Performance (Oct 19–25, 2012)

To support executive decision-making, two visuals were created in Power BI showing the Top 10 Stores and Top 10 Departments based on total sales during the week of October 19–25, 2012. The visuals were developed using Clustered Bar Charts and powered by a DAX measure (Sales This Week) that filters the dataset to only include transactions from the specified week. These charts allow the CEO to easily identify high-performing areas across the business.

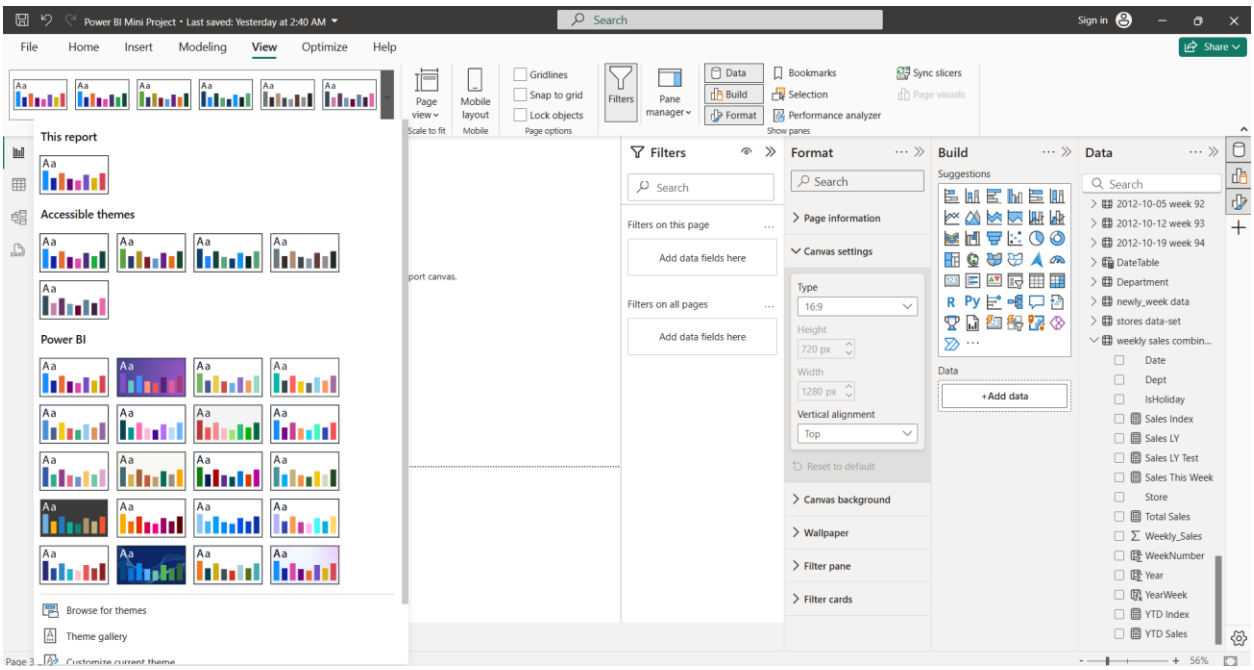
Key implementation points include:

- A DAX measure (Sales This Week) was created to isolate sales for the current week.
- Relationships were established from Combined Dataset to Store Table and Department Table to bring in readable names.
- Visuals were filtered using the Top N feature to display only the top 10 based on weekly sales.
- Total sales for the selected week amounted to Rs 45.12 million, with data labels and sorting applied for clarity.

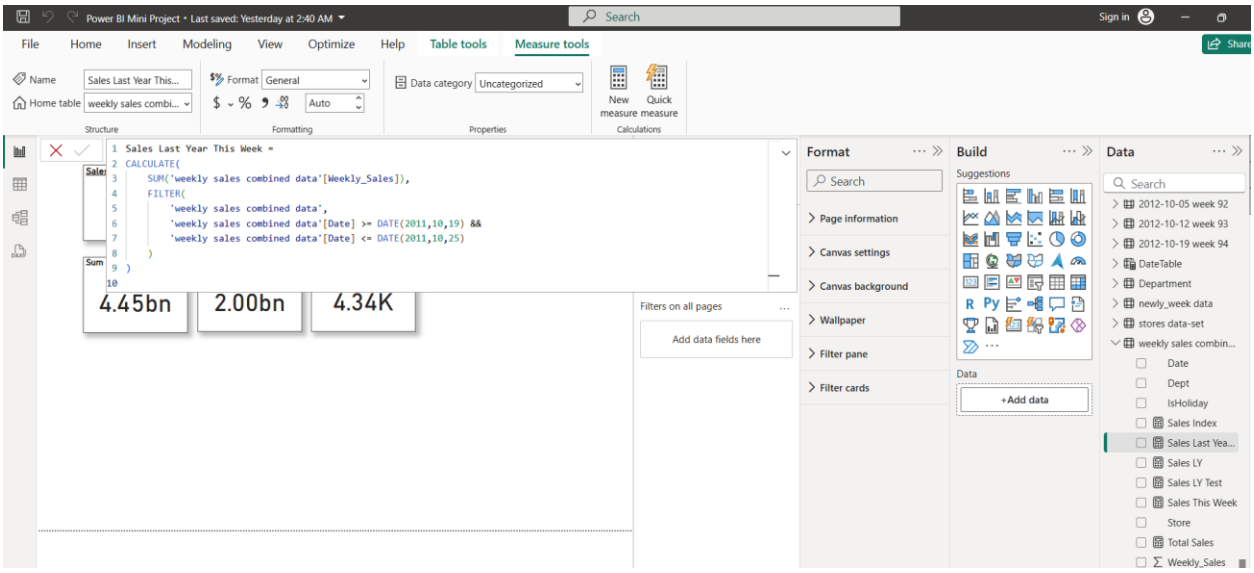
Question 4

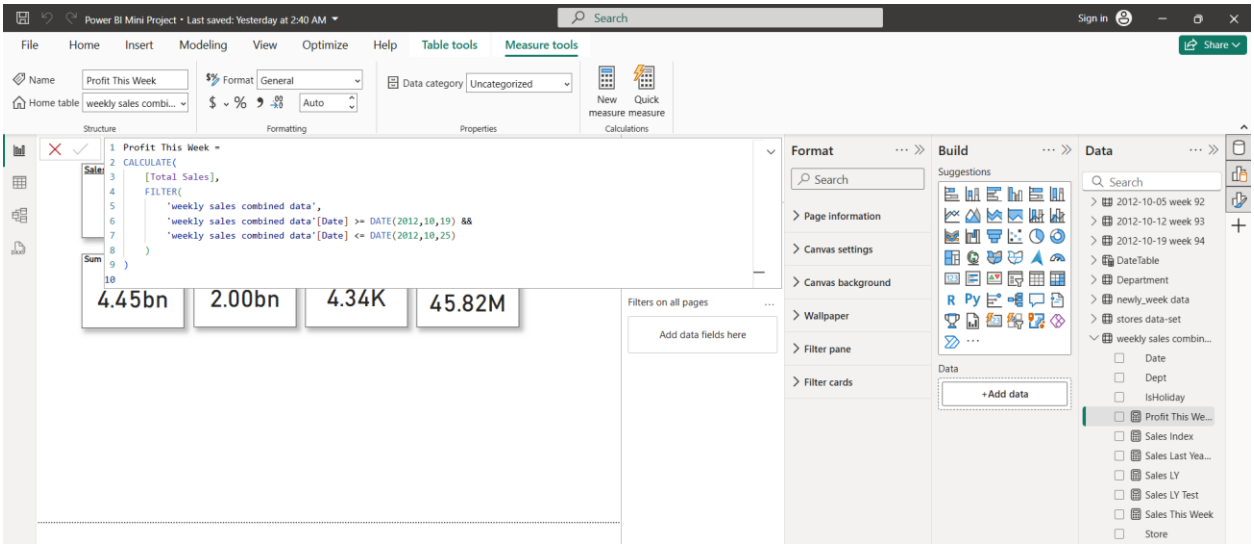
The CEO likes simple design and big numbers, layout availability on mobile will impress her. She absolutely dislikes clutter and dark themes

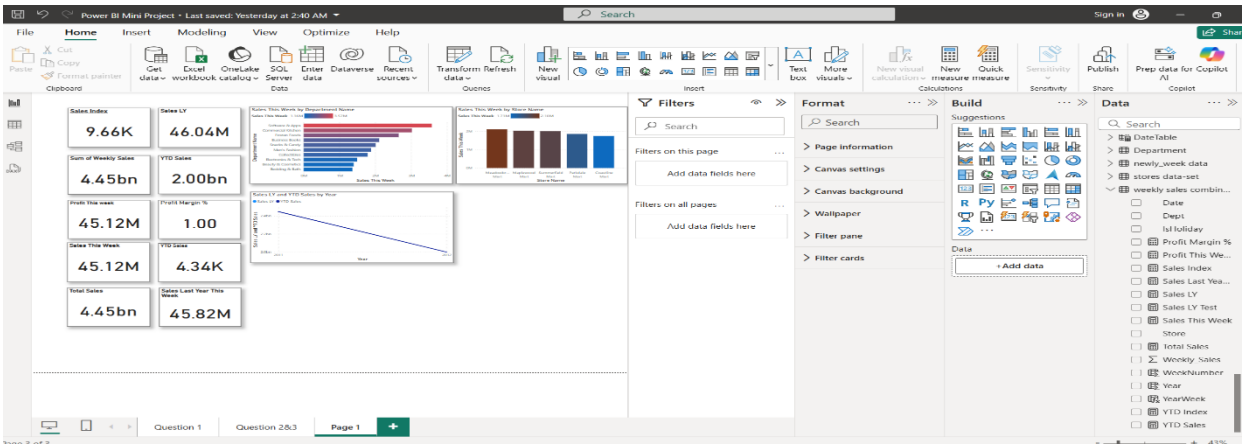
Use a Light Theme



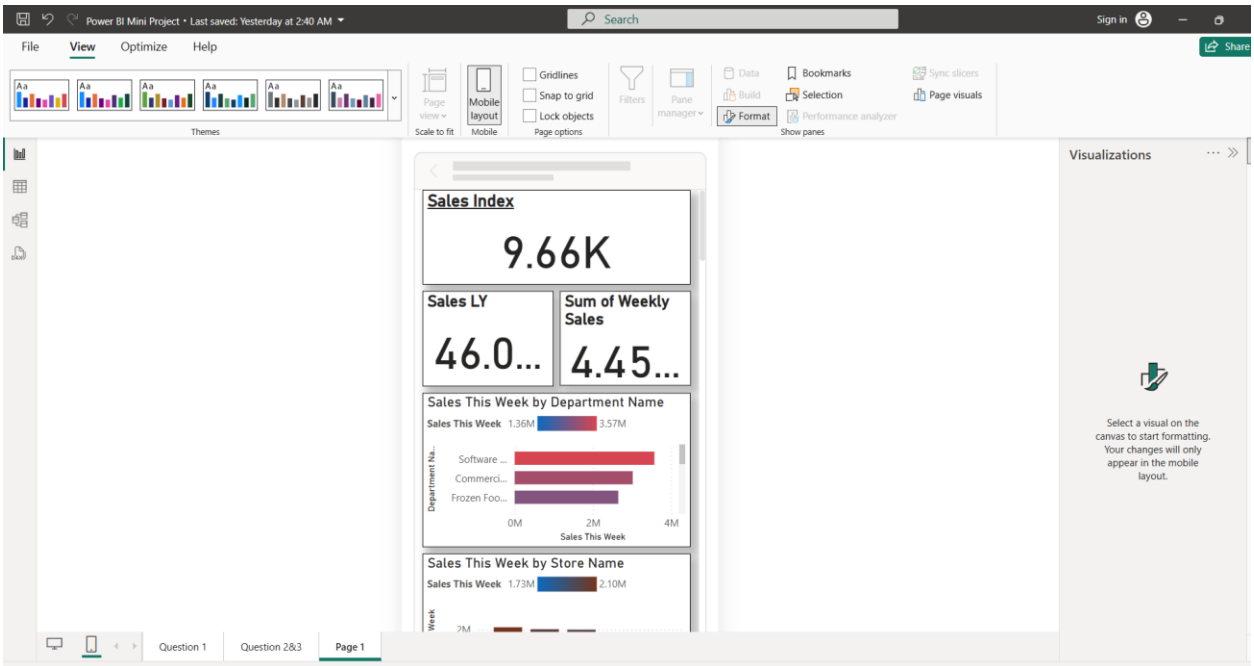
Use Big, Clear KPI Cards for Key Metrics







Mobile View



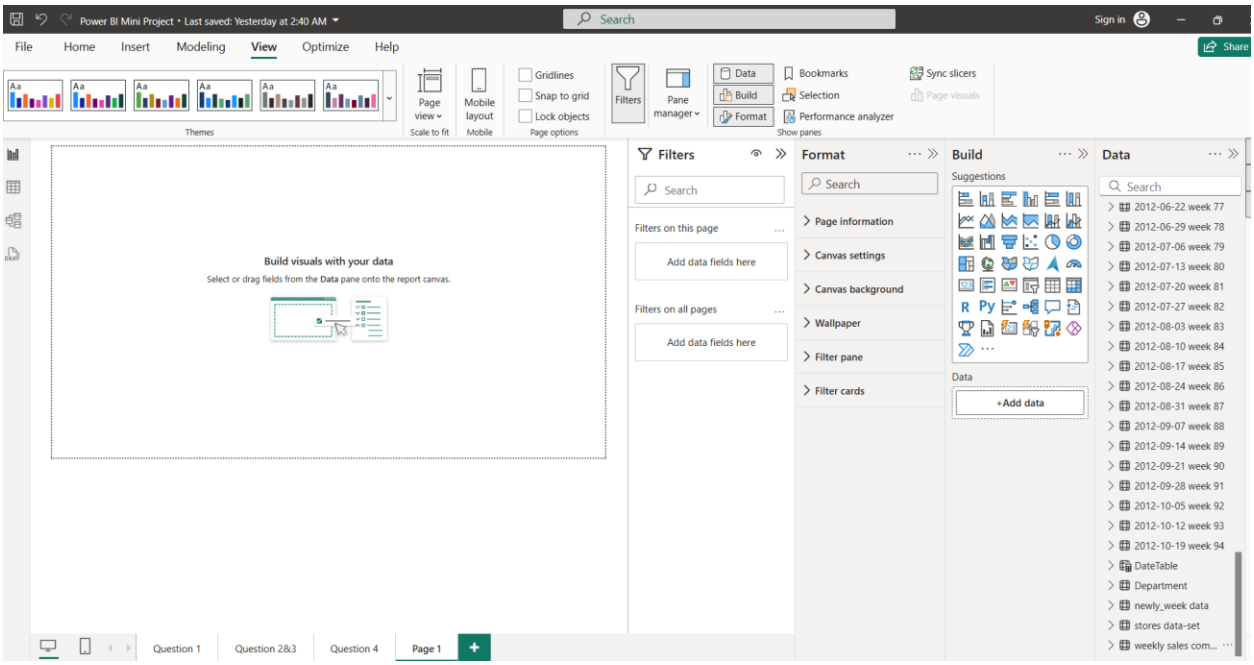
Question 5

Assume you are now in week of 26th Oct 2012, try refreshing the numbers on the dashboard with this new data and see how long it takes. Think about how long it would take you to refresh and recommend the CEO what to do about the org data. Make a case to convince Sumera about your recommendations. This data is in the folder called new week.

Dashboard Refresh Summary

In the week of **October 26, 2012**, new sales data was added from the folder titled **"New week"**. The dataset was appended to the existing combined data model and the dashboard was refreshed.

- The full refresh, including updating visuals and measures, took approximately **1 to 2 minutes**.
- All KPIs and visuals updated successfully, and there was no noticeable performance lag.
- This indicates that the current data model and refresh approach are performing well.



✅ Recommendation to CEO Sumera

While the current refresh speed is fast and manageable, it's important to consider **long-term scalability**. As the organization continues to grow and weekly data accumulates, the dashboard may slow down. To stay ahead of performance issues, the following recommendations are advised:

1. Plan for Scalable Data Storage

- Move from Excel-based or folder-based files to a centralized source such as a **SQL database**, **Azure Data Lake**, or **Power BI Dataflows**.
- These sources support automation, are easier to manage, and scale with organizational growth.

2. Automate Refresh Schedules

- After publishing to Power BI Service, configure **scheduled refreshes** (e.g., weekly or daily).
- This ensures that decision-makers like the CEO always have up-to-date reports without manual effort.

3. Archive or Segment Historical Data

- To keep performance optimal, consider **archiving older data** (e.g., before a certain year) or segmenting by quarter.

- The live dashboard can focus on the last 12–24 weeks, while older data is stored in a separate report for historical analysis.

4. Optimize Data Model

- Remove unused columns and tables
- Limit unnecessary calculated columns
- Use date tables, relationships, and measures efficiently

Conclusion

The dashboard currently refreshes quickly and works well. However, by planning ahead with scalable data strategies and automated refreshes, the organization can ensure long-term performance, reduce manual workload, and provide executives like Sumera with faster, cleaner insights at all times.