Advance DAX

Advanced DAX Topic: Time Intelligence – Year-to-Date (YTD), Moving Average, and Rolling Totals

These are powerful analytics functions used for business performance over time.

Practical Goals with Advanced DAX:

We'll calculate:

1. **Year-to-Date (YTD) Sales**
2. **3-Month Moving Average**
3. **Rolling 12-Month Total**

Step-by-Step in Power BI Desktop

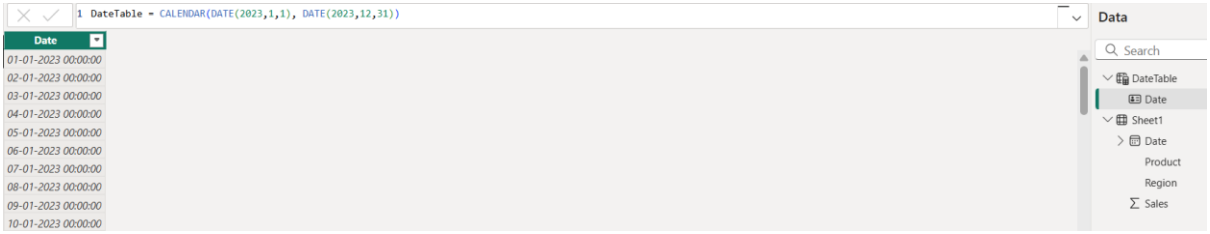
1. Load Dataset

- Open **Power BI Desktop**
- Go to **Home > Get Data > Excel / Enter Data**
- Load the sample table above

2. Create Date Table (Important for Time Intelligence)

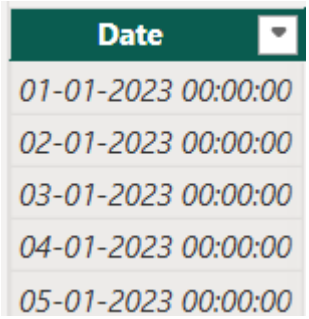
- Go to **Modeling > New Table**, enter:

```
DateTable = CALENDAR(DATE(2023,1,1), DATE(2023,12,31))
```



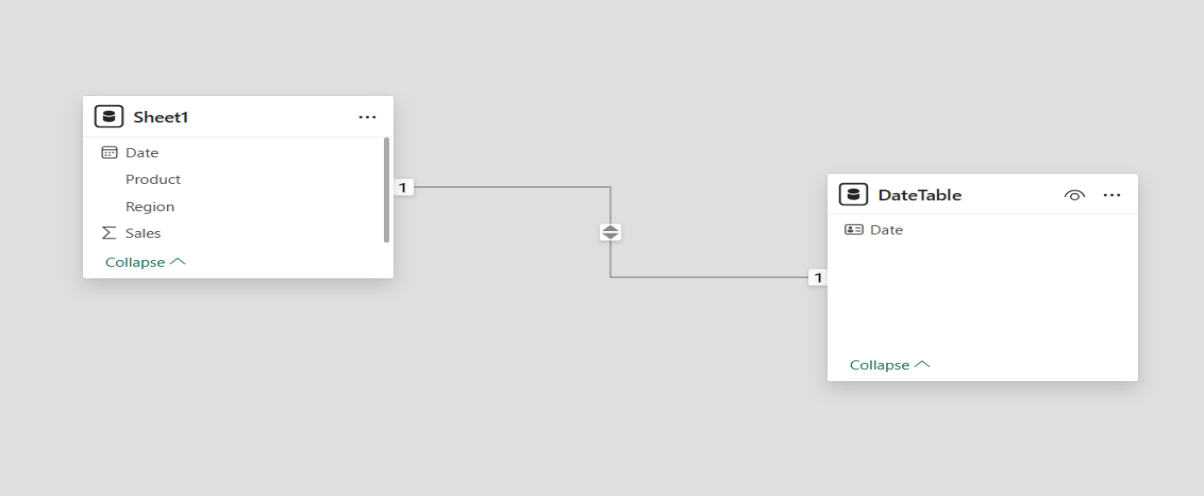
1) Mark it as the **Date Table**:

- Select the table > **Modeling > Mark as Date Table > choose Date column**



2) Create relationships:

- Drag the Date column from your Sales table and link it to the Date column in the DateTable.



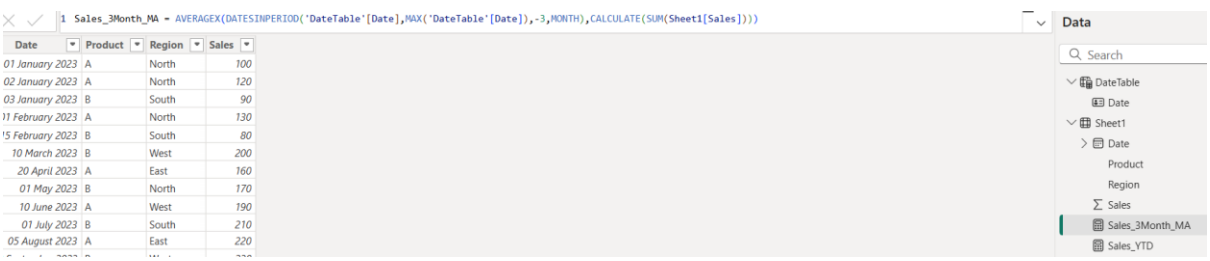
Create DAX Measures

YTD Sales:

Sales_YTD = TOTALYTD(SUM(Sheet1[Sales]),'DateTable'[Date])

3-Month Moving Average:

Sales_3Month_MA = AVERAGEX(DATESINPERIOD('DateTable'[Date],MAX('DateTable'[Date]),-3,MONTH),CALCULATE(SUM(Sheet1[Sales])))



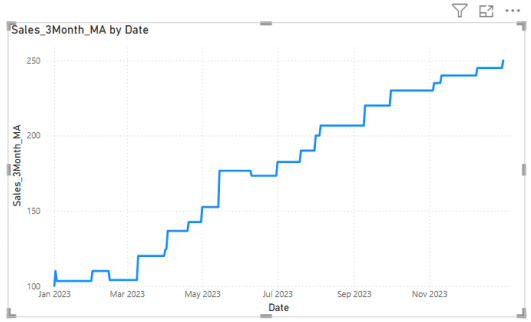
Rolling 12-Month Total:

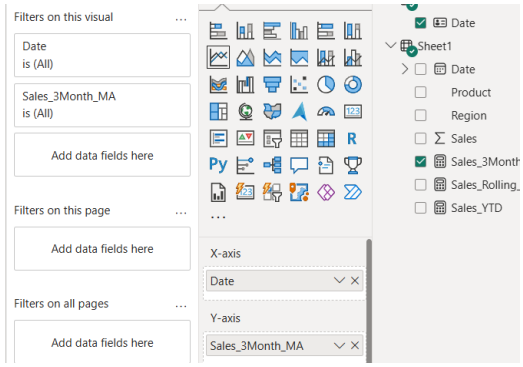
Visualize in Power BI

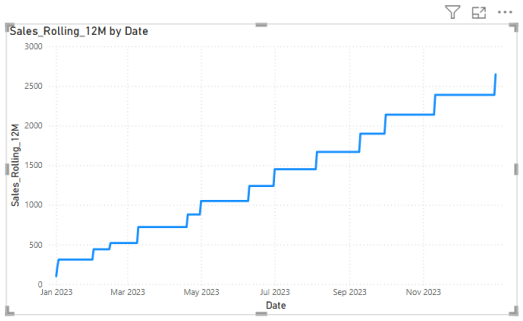
Create a Line Chart:

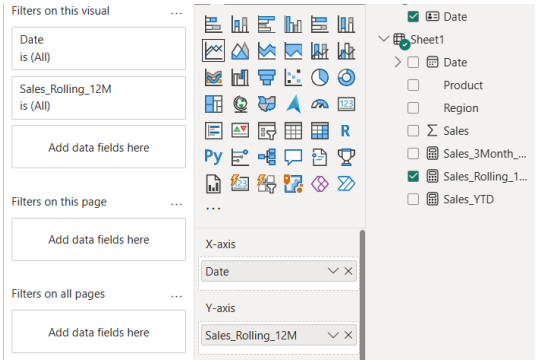
- Axis: DateTable[Date]
- Values: Sales_3Month_MA, Sales_Rolling_12M

This gives a trend of performance over time using advanced calculations.









What Are Bookmarks & Buttons?

Feature	Purpose
Bookmarks	Capture the current state of the report page (filters, visuals, etc.) to return to later
Buttons	Add clickable elements to navigate between bookmarks, pages, or trigger actions

Real-Life Use Case Example

You have a report with:

- A **summary dashboard**
- A **detailed table**
- A **graphical view**

You want to let the user click a button to switch between views **without switching pages** — all on the same page. This is possible using **Bookmarks + Buttons**.

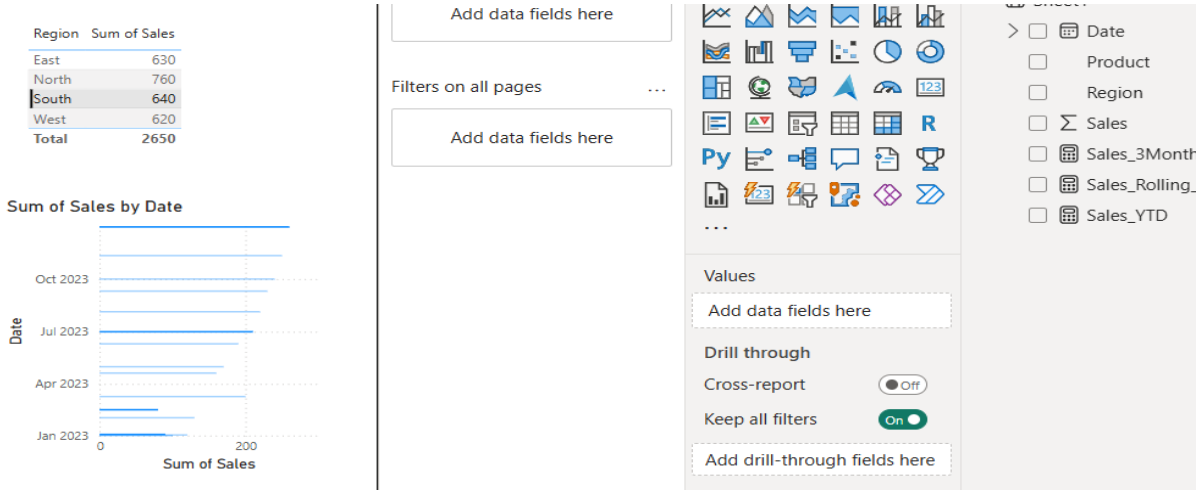
Step-by-Step Tutorial: Bookmarks & Buttons in Power BI Desktop

Scenario: Toggle between “Table View” and “Chart View”

Step 1: Create Visuals

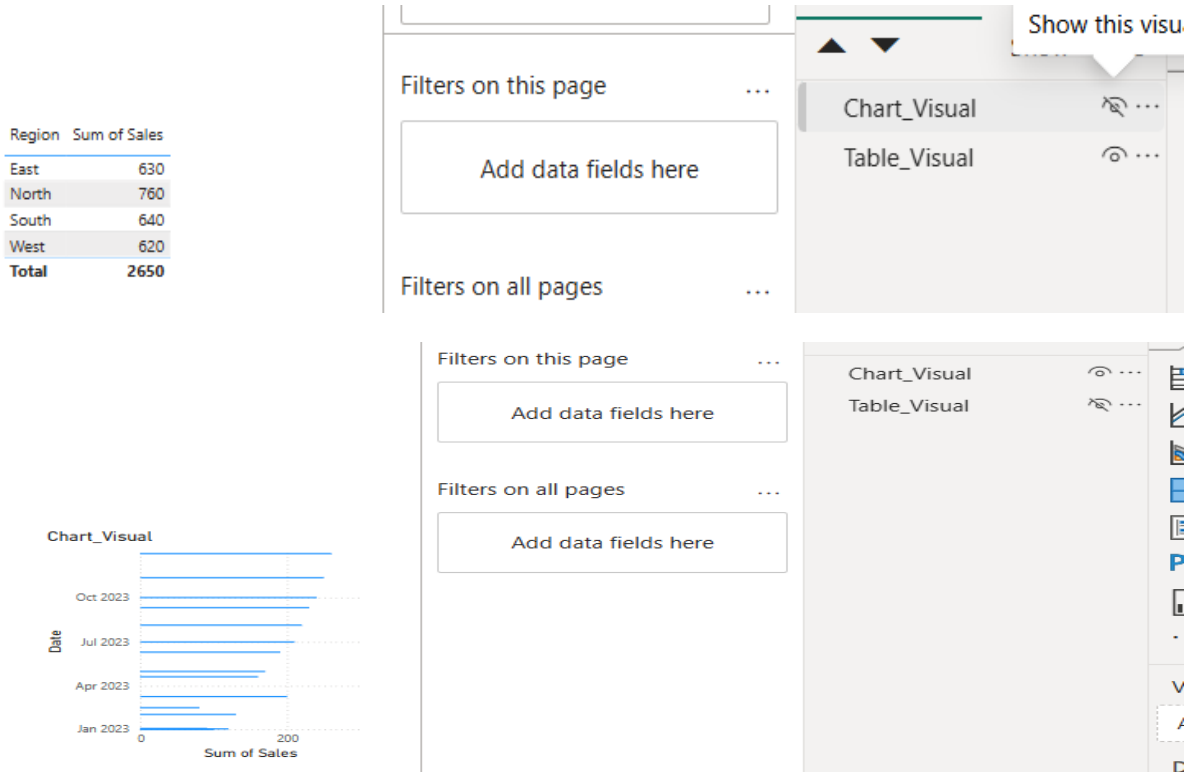
1. **Create a Table visual** showing sales by region.
2. **Create a Bar Chart** showing sales over time.

Place them on top of each other or side by side.



Step 2: Create Two Views

- **View 1: Table only**
    - Show the table.
    - Hide the chart (select > Format > Selection Pane > Hide it).
- **View 2: Chart only**
    - Show the chart.
    - Hide the table.

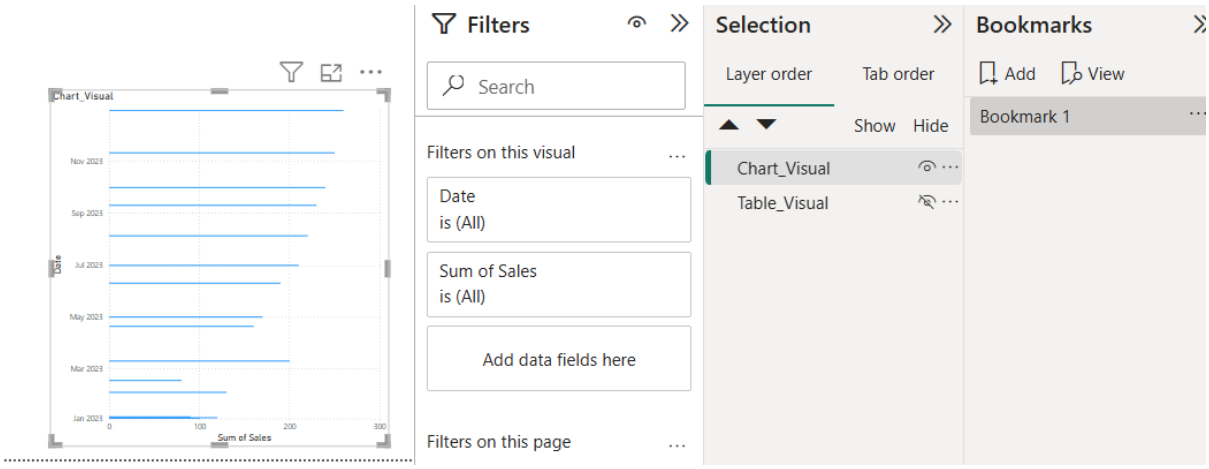


Step 3: Use Bookmarks

1. Go to **View > Bookmarks Pane**
2. Go to **View > Selection Pane**
3. With **only the table shown**, click **Add Bookmark**, name it Table View
4. With **only the chart shown**, click **Add Bookmark**, name it Chart View

Make sure to check:

- **Data**: ✅
- **Display**: ✅
- **Current Page**: ✅

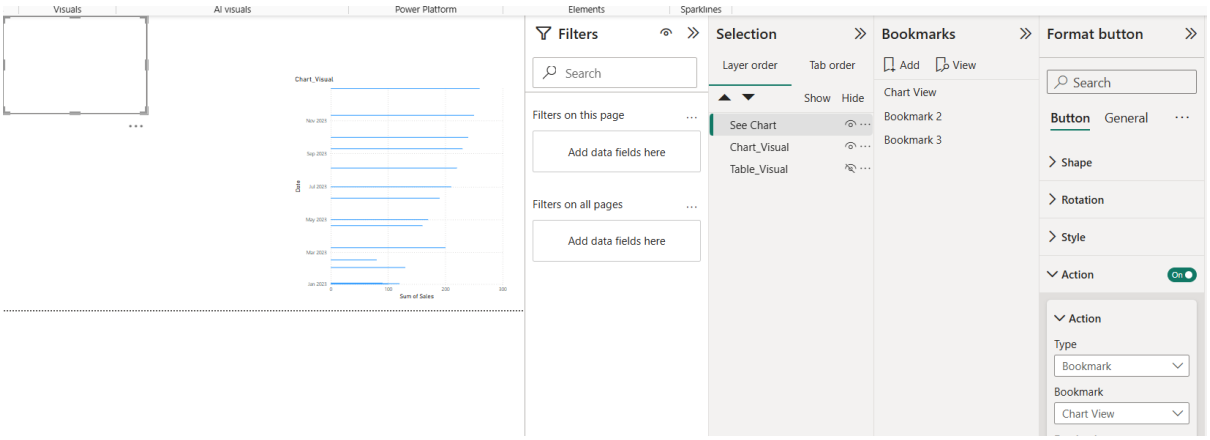


Step 4: Add Buttons

1. Go to **Insert > Buttons > Blank**
2. Rename the button (right pane) as “See Chart”
3. With button selected, go to **Action > Type: Bookmark > Bookmark: Chart View**

Repeat:

- Insert another button: “See Table”
- Action > Bookmark > Table View



1. TOOLTIP in Power BI

What is a Tooltip?

A **Tooltip** is a small pop-up window that appears when you hover over a visual. It gives **additional context or insight** — such as detailed metrics or charts — without cluttering the main report.

Basic Tooltip (Default)

By default, when you hover over a visual (e.g., bar chart), Power BI shows a tooltip with the values for that data point (e.g., date and total sales).

Custom Tooltip (with another page)

1. **Create a new Page**:
    - Click the **+ icon** at the bottom to add a new page
    - Rename it Tooltip_Page
2. **Make it a Tooltip Page**:
    - Go to the **Visualizations pane > Format pane (paint roller icon)**
    - Set **Page Information > Tooltip** = ON
    - Set **Page Size > Type = Tooltip**
3. **Add visuals to your Tooltip Page**
    - Add card visuals, KPIs, or mini charts
    - Example: Show total sales, 3-month avg, and region filter in tooltip
4. **Apply Tooltip to a Visual**:
    - Go to your main report page
    - Click on a visual (e.g., bar chart)
    - Go to **Visualizations > Format > Tooltip**
    - Set **Type: Report Page**
    - Set **Page: Tooltip_Page**

Now, when you hover over a data point in the bar chart, Power BI will show your custom tooltip page.

2. CONDITIONAL FORMATTING

What is Conditional Formatting?

It visually emphasizes data **based on rules or logic** using:

- Color
- Data bars
- Icons

How to Apply It in a Table or Matrix

Example: Highlight high and low sales by color

1. Add a **Table** visual with:
    - Region
    - Total_Sales measure
2. Click on the **dropdown** arrow next to the Total_Sales column in the Values section.
3. Click **Conditional Formatting > Background Color**
4. In the dialog:
    - Choose **Format by**: Color scale
    - **Based on field**: Total_Sales
    - Select colors (e.g., red for low, green for high)

Now each row's background will change color based on its sales value.

What is Power BI Service?

Power BI Service is a cloud-based business analytics service provided by Microsoft. It allows users to visualize data, share insights, and collaborate on reports and dashboards. Here are some key features and components of Power BI Service:

1. Data Visualization: Power BI Service enables users to create interactive reports and dashboards using a wide range of visualization tools. Users can choose from various chart types, maps, and tables to represent their data effectively.
2. Data Connectivity: It supports connectivity to a variety of data sources, including databases, cloud services, and Excel files. Users can import data from sources like SQL Server, Azure, Salesforce, and many others.
3. Collaboration: Power BI Service allows teams to collaborate on reports and dashboards. Users can share their findings with colleagues, set up workspaces for team projects, and manage permissions to control who can view or edit reports.
4. Real-time Data: The service supports real-time data streaming, allowing users to monitor live data and receive updates as they happen. This is particularly useful for operational dashboards and monitoring key performance indicators (KPIs).
5. Natural Language Queries: Users can interact with their data using natural language queries. This feature, known as Q&A, allows users to ask questions about their data in plain English and receive visualizations as answers.
6. Mobile Access: Power BI Service is accessible on mobile devices through the Power BI mobile app, enabling users to view and interact with reports and dashboards on the go.
7. Integration with Other Microsoft Services: Power BI Service integrates seamlessly with other Microsoft products, such as Excel, Azure, and Teams, enhancing productivity and collaboration.
8. Data Refresh: Users can schedule data refreshes to ensure that their reports and dashboards are always up to date with the latest data.
9. Security and Compliance: Power BI Service includes robust security features, such as row-level security, to ensure that sensitive data is protected and that users only see data relevant to them.

10. Power BI Premium: For organizations with advanced needs, Power BI Premium offers dedicated cloud resources, larger data capacity, and additional features like paginated reports and AI capabilities.

Overall, Power BI Service is a powerful tool for organizations looking to leverage data for better decision-making and insights. It provides a user-friendly interface and a wide range of features that cater to both technical and non-technical users.

Workspaces & Sharing Reports

In Power BI, **Workspaces** and **Sharing Reports** are essential features that facilitate collaboration, organization, and distribution of reports and dashboards among users. Here's a detailed explanation of both concepts:

Workspaces

1. **Definition**: A workspace in Power BI is a collaborative environment where users can create, manage, and share Power BI content such as reports, dashboards, datasets, and dataflows. Workspaces help organize content and control access to it.
2. **Types of Workspaces**:
    - **My Workspace**: This is a personal workspace for individual users. It is private and is used for personal projects and reports that are not yet ready for sharing.
    - **App Workspaces**: These are collaborative workspaces designed for teams. They allow multiple users to work together on reports and dashboards. App workspaces can be shared with other users or groups.
3. **Roles and Permissions**: Workspaces have different roles that determine what users can do within them:
    - **Admin**: Full control over the workspace, including managing permissions and content.
    - **Member**: Can create and edit content but cannot manage permissions.
    - **Contributor**: Can create and edit content but has limited access to manage workspace settings.
    - **Viewer**: Can only view content and cannot make any changes.
4. **Content Management**: Users can upload datasets, create reports, and build dashboards within a workspace. This organization helps teams collaborate effectively and maintain version control.
5. **Publishing Apps**: Once the content in a workspace is finalized, it can be packaged into an app and published for broader distribution. Apps provide a streamlined way to share reports and dashboards with users outside the workspace.

Sharing Reports

1. **Sharing Options**: Power BI allows users to share reports and dashboards in several ways:
    - **Direct Sharing**: Users can share reports directly with other Power BI users by sending an email invitation. The recipients must have a Power BI Pro license or the report must be in a Premium workspace.
    - **Publish to Web**: This option allows users to create a public link to a report that can be shared with anyone, even those without a Power BI account. However, this method is not suitable for sensitive data, as it makes the report publicly accessible.
    - **Embedding**: Reports can be embedded in applications, websites, or SharePoint. This allows users to integrate Power BI content into their existing workflows.
2. **Access Control**: When sharing reports, users can control who has access to the content. They can set permissions to allow users to view, edit, or reshare the reports. Row-level security can also be implemented to restrict data visibility based on user roles.
3. **Apps**: As mentioned earlier, users can publish reports and dashboards as part of an app. This provides a more organized way to share multiple reports and dashboards with a larger audience, along with a consistent user experience.
4. **Notifications and Alerts**: Users can set up alerts to notify them when data in a report changes, ensuring that stakeholders are kept informed of important updates.