

Lesson 13

Topic: Introduce time-based calculations.

Prerequisites: Download Chocolate Sales.csv file and disable Auto DateTime options by Options in Current File and create new DATE table by using Calendarauto and Format functions.

The screenshot shows the Power BI Desktop interface with a new table named "Calendar". The table structure is defined by the following DAX code:

```
1 Calendar =  
2 ADDCOLUMNS(  
3     CALENDARAUTO(),  
4     "Year", YEAR([Date]),  
5     "Month Number", MONTH([Date]),  
6     "Month Name", FORMAT([Date], "MMMM"),  
7     "Quarter", "Q" & FORMAT([Date], "Q")  
8 )
```

The table contains 1,096 rows of data from July 2022, with columns: Date, Year, Month Number, Month Name, and Quarter. The Data pane on the right shows the table structure and some data from the "Chocolate Sales" data source.

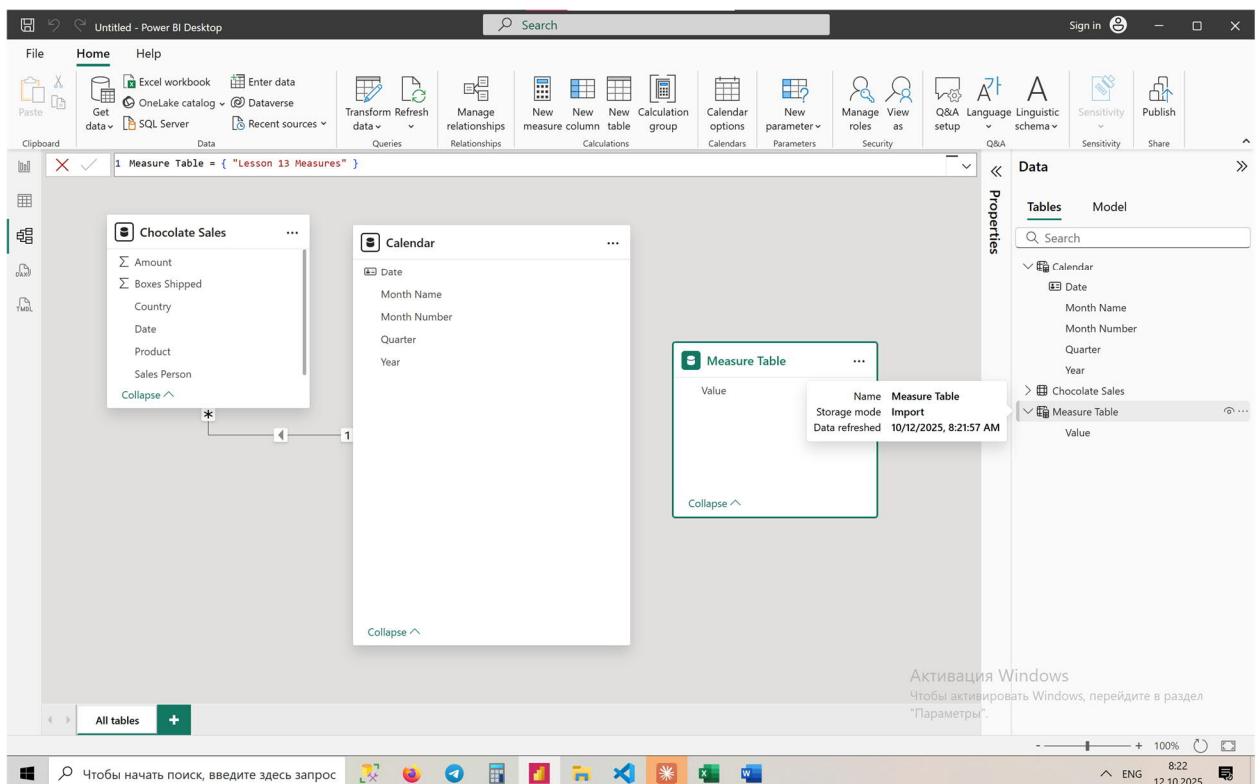
New table – Calendar

The screenshot shows the Power BI Desktop interface. In the center, there are two tables: 'Chocolate Sales' and 'Calendar'. The 'Chocolate Sales' table has columns for Amount, Boxes Shipped, Country, Date, Product, and Sales Person. The 'Calendar' table has columns for Date, Month Name, Month Number, Quarter, and Year. On the right side, the 'Properties' pane is open for the 'Chocolate Sales' table. It shows the table's name is 'Chocolate Sales', and it has a description field. There are also sections for 'Synonyms' (containing 'chocolate sale, sale'), 'Row label' (set to 'Select a row label'), 'Key column' (set to 'Select a column with unique values'), 'Is hidden' (set to 'No'), and 'Is featured table' (set to 'No').

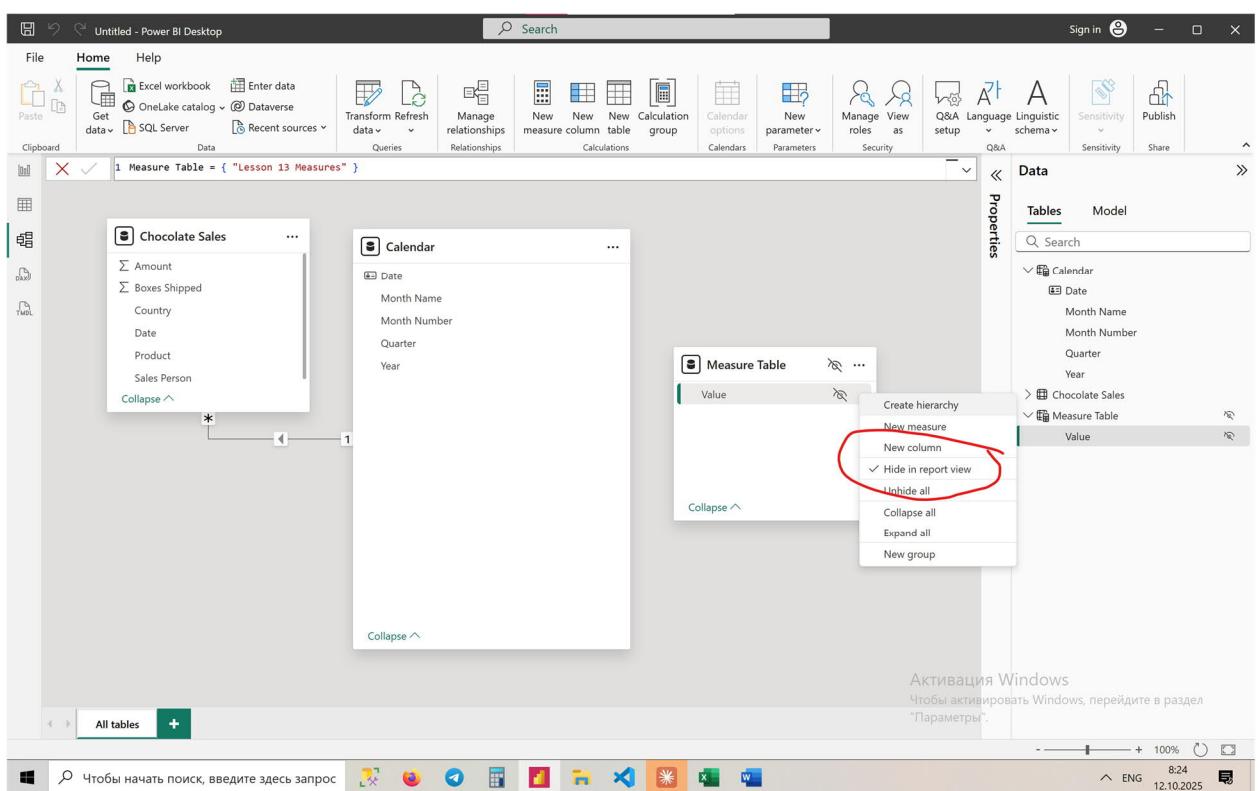
Connection by Date between 2 tables

The screenshot shows the 'Mark as a date table (not recommended)' dialog box in Power BI Desktop. It contains a warning message about marking tables as date tables, a toggle switch for 'Mark as a date table' (which is turned 'On'), and a dropdown menu for 'Choose a date column' (set to 'Date'). Below the dropdown, a message says 'Validated successfully'. At the bottom of the dialog are 'Save' and 'Cancel' buttons. The background shows the Power BI interface with the 'Chocolate Sales' and 'Calendar' tables. The 'Properties' pane on the right shows the 'Calendar' table is selected, and the 'Date' column is highlighted.

Marking as a date table



Creating a new table only for measures



We should hide it

BASIC LEVEL (1–5)
1 Total Sales

Total Sales = SUM('Chocolate Sales'[Amount])

The screenshot shows the Power BI Desktop interface. The formula bar at the top contains the DAX formula: `1 Total Sales = SUM('Chocolate Sales'[Amount])`. Below the formula bar, three tables are displayed in the Data Model view: **Chocolate Sales**, **Calendar**, and **Measure Table**. The **Chocolate Sales** table includes columns for Amount, Boxes Shipped, Country, Date, Product, and Sales Person. The **Calendar** table includes Date, Month Name, Month Number, Quarter, and Year. The **Measure Table** contains a single column **Total Sales**. A relationship is visible between the **Chocolate Sales** and **Calendar** tables. The Properties pane on the right shows the properties for the **Total Sales** measure. The bottom status bar indicates "Активация Windows" (Windows Activation) and "Чтобы активировать Windows, перейдите в раздел 'Параметры'." (To activate Windows, go to the 'Parameters' section.).

2. Total Sales — Current Year

Total Sales Current Year =

```
CALCULATE(  
    [Total Sales],  
    FILTER(  
        'Calendar',  
        YEAR('Calendar'[Date]) = YEAR(TODAY())  
    )  
)
```

The screenshot shows the Power BI Desktop interface. In the center, there's a code editor window displaying DAX code:

```
1 Total Sales Current Year =  
2 CALCULATE(  
3     [Total Sales],  
4     FILTER(  
5         'Calendar',  
6         YEAR('Calendar'[Date]) = YEAR(TODAY())  
7     )  
8 )  
9
```

A context menu is open over the code, specifically over the line 'Total Sales Current Year'. The menu is titled 'Measure Table' and contains the following items:

- Value
- Total Sales
- Total Sales Current Month
- Total Sales Current Year** (highlighted)
- Total Sales Last Year

The ribbon at the top has tabs for File, Home, Help, Data, etc. The Data tab is selected. The Power BI service ribbon is also visible at the top right.

3. Total Sales — Last Year

Total Sales Last Year =

```
CALCULATE(  
    [Total Sales],  
    FILTER(  
        'Calendar',  
        YEAR('Calendar'[Date]) = YEAR(TODAY()) - 1  
    )  
)
```

The screenshot shows the Power BI Desktop interface. The formula bar at the top contains the following DAX code:

```

1 Total Sales Last Year =
2 CALCULATE(
3     [Total Sales],
4     FILTER(
5         'Calendar',
6         YEAR('Calendar'[Date]) = YEAR(TODAY()) - 1
7     )
8 )

```

A context menu is open over the measure table 'Total Sales Last Year'. The menu shows the following structure:

- Name: [Total Sales Last Year]
- Value
- Total Sales
- Total Sales Current Month
- Total Sales Last Year**
- Collapse ▾

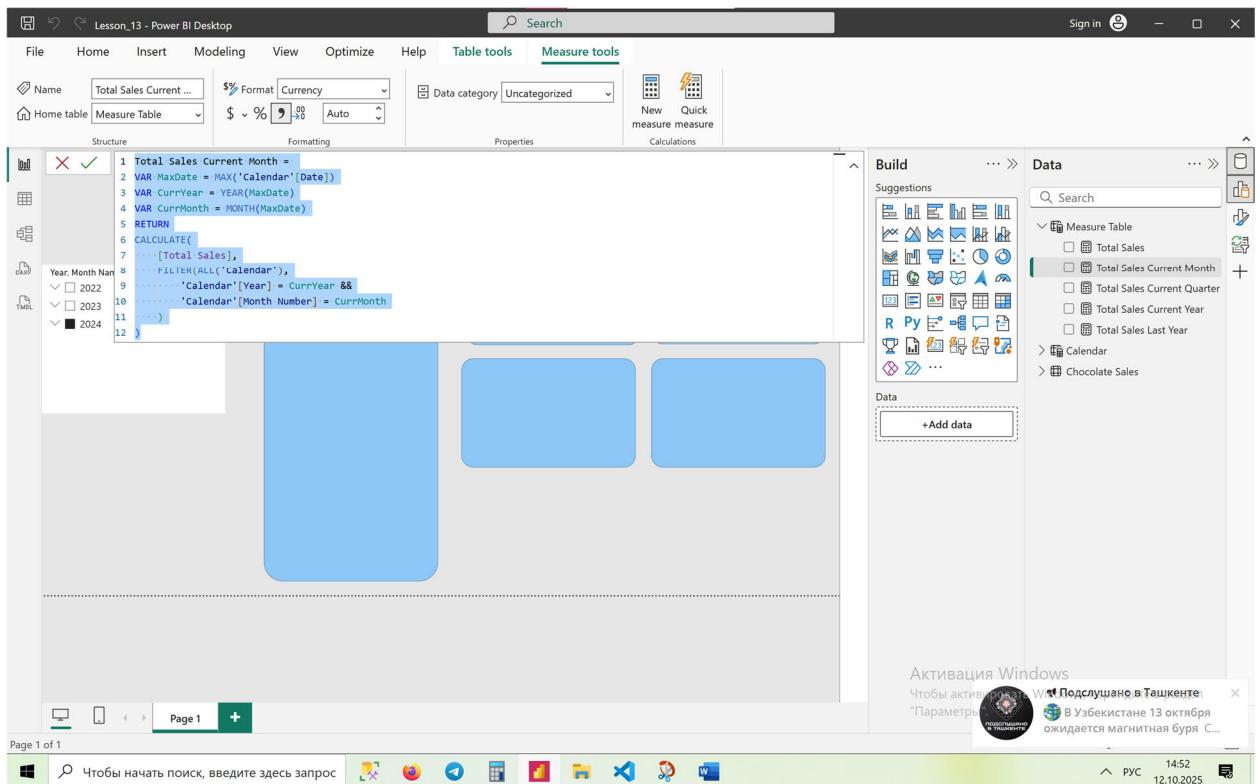
The 'Tables' tab in the Data pane is selected, showing the following tables:

- Measure Table
- Total Sales
- Total Sales Current Month
- Total Sales Last Year**
- Value
- Calendar
- Date
- Month Name
- Month Number
- Quarter
- Year
- Chocolate Sales
- Amount
- Boxes Shipped
- Country
- Date
- Product
- Sales Person

At the bottom of the screen, there is a Windows taskbar with various pinned icons and system status information.

4. Total Sales — Current Month

Total Sales Current Month =
VAR MaxDate = MAX('Calendar'[Date])
VAR CurrYear = YEAR(MaxDate)
VAR CurrMonth = MONTH(MaxDate)
RETURN
CALCULATE(
 [Total Sales],
 FILTER(ALL('Calendar'),
 'Calendar'[Year] = CurrYear &&
 'Calendar'[Month Number] = CurrMonth
)
)



5. Create a measure to calculate total sales for the **current quarter**.

Total Sales Current Quarter =

```

VAR MaxDate = MAX('Calendar'[Date])
VAR CurrYear = YEAR(MaxDate)
VAR CurrQ   = QUARTER(MaxDate)
RETURN
CALCULATE(
    [Total Sales],
    FILTER(
        ALL('Calendar'),
        'Calendar'[Year] = CurrYear &&
        'Calendar'[Quarter] = CurrQ
    )
)

```

Lesson_13 - Power BI Desktop

File Home Insert Modeling View Optimize Help Table tools Measure tools

Name: Total Sales Current ... Format: Currency \$ % Auto Data category: Uncategorized New Quick measure measure

Structure: Total Sales Current Quarter = VAR MaxDate = MAX(Calendar[Date]) VAR CurrYear = YEAR(MaxDate) VAR CurrQ = QUARTER(MaxDate) RETURN CALCULATE([Total Sales], FILTER(ALL('Calendar'), 'Calendar'[Year] = CurrYear & 'Calendar'[Quarter] = CurrQ))

Properties:

Build:

Data:

Measure Table: Total Sales, Total Sales Current Month, Total Sales Current Quarter, Total Sales Current Year, Total Sales Last Year, Calendar, Chocolate Sales

Активация Windows: Чтобы активировать Windows, перейдите в раздел "Параметры".

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Intermediate (6–10)

6. Sales Growth % Compared to Last Year (%YoY)

Lesson_13 - Power BI Desktop

File Home Insert Modeling View Optimize Help Table tools Measure tools

Name: Sales Growth % YoY Format: General \$ % Auto Data category: Uncategorized New Quick measure measure

Structure: Sales Growth % YoY = DIVIDE([Total Sales Current Year] - [Total Sales Last Year], [Total Sales Last Year])

Properties:

Build:

Data:

Measure Table: Sales Growth % YoY, Total Sales, Total Sales Current Month, Total Sales Current Quarter, Total Sales Current Year, Total Sales Last Year, Calendar, Chocolate Sales

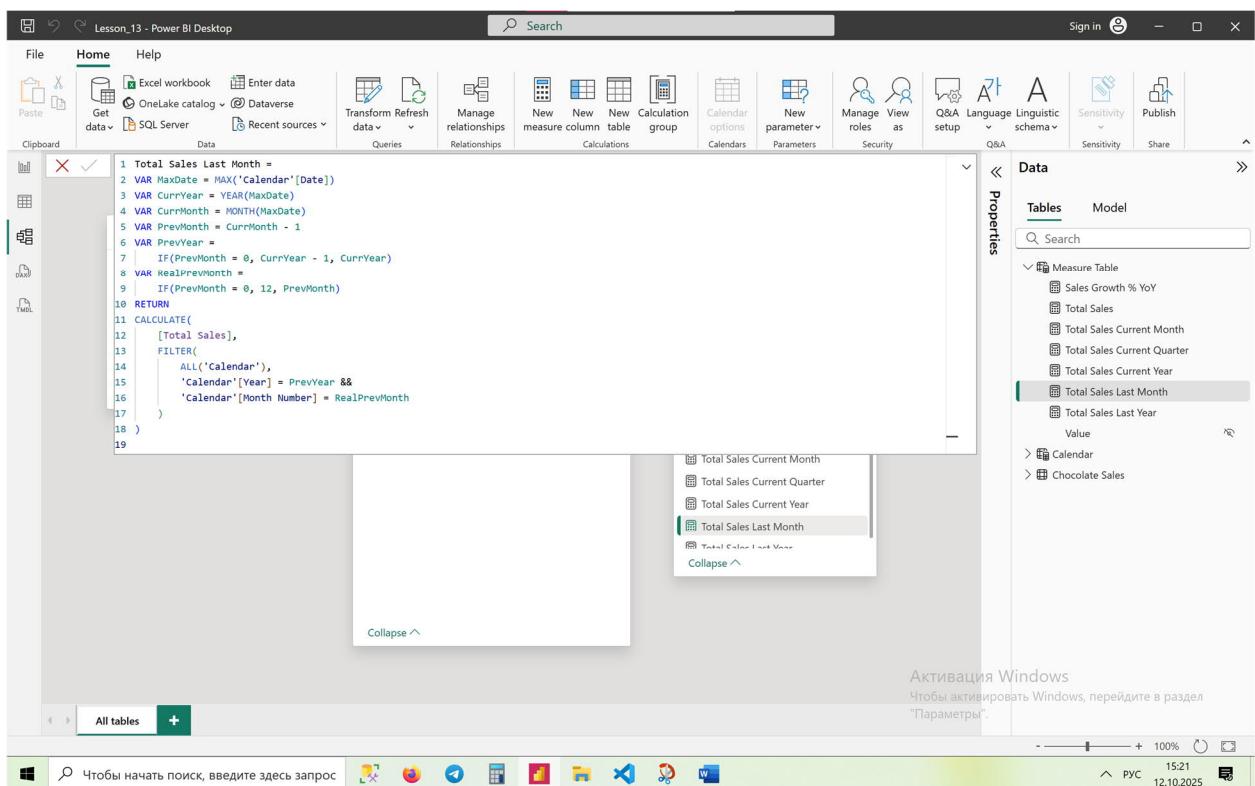
Активация Windows: Чтобы активировать Windows, перейдите в раздел "Параметры".

Page 1

7. Create a measure to calculate to retrieve sales from the last month.

Total Sales Last Month =

```
VAR MaxDate = MAX('Calendar'[Date])
VAR CurrYear = YEAR(MaxDate)
VAR CurrMonth = MONTH(MaxDate)
VAR PrevMonth = CurrMonth - 1
VAR PrevYear =
    IF(PrevMonth = 0, CurrYear - 1, CurrYear)
VAR RealPrevMonth =
    IF(PrevMonth = 0, 12, PrevMonth)
RETURN
CALCULATE(
    [Total Sales],
    FILTER(
        ALL('Calendar'),
        'Calendar'[Year] = PrevYear &&
        'Calendar'[Month Number] = RealPrevMonth
    )
)
```



8. Create a measure to calculate a running total of sales using

Running Total Sales =

```
CALCULATE(
    [Total Sales],
```

```

FILTER(
    ALLSELECTED('Calendar'[Date]),
    'Calendar'[Date] <= MAX('Calendar'[Date])
)
)

```

The screenshot shows the Power BI Desktop interface. The formula bar at the top contains the following DAX code:

```

1 Running Total Sales =
2 CALCULATE(
3     [Total Sales],
4     FILTER(
5         ALLSELECTED('Calendar'[Date]),
6         'Calendar'[Date] <= MAX('Calendar'[Date])
7     )
8 )

```

The Data pane on the right shows a 'Measure Table' named 'Running Total Sales' with the following storage mode:

- Storage mode: Import
- Data refreshed: 10/12/2025, 8:21:57 AM

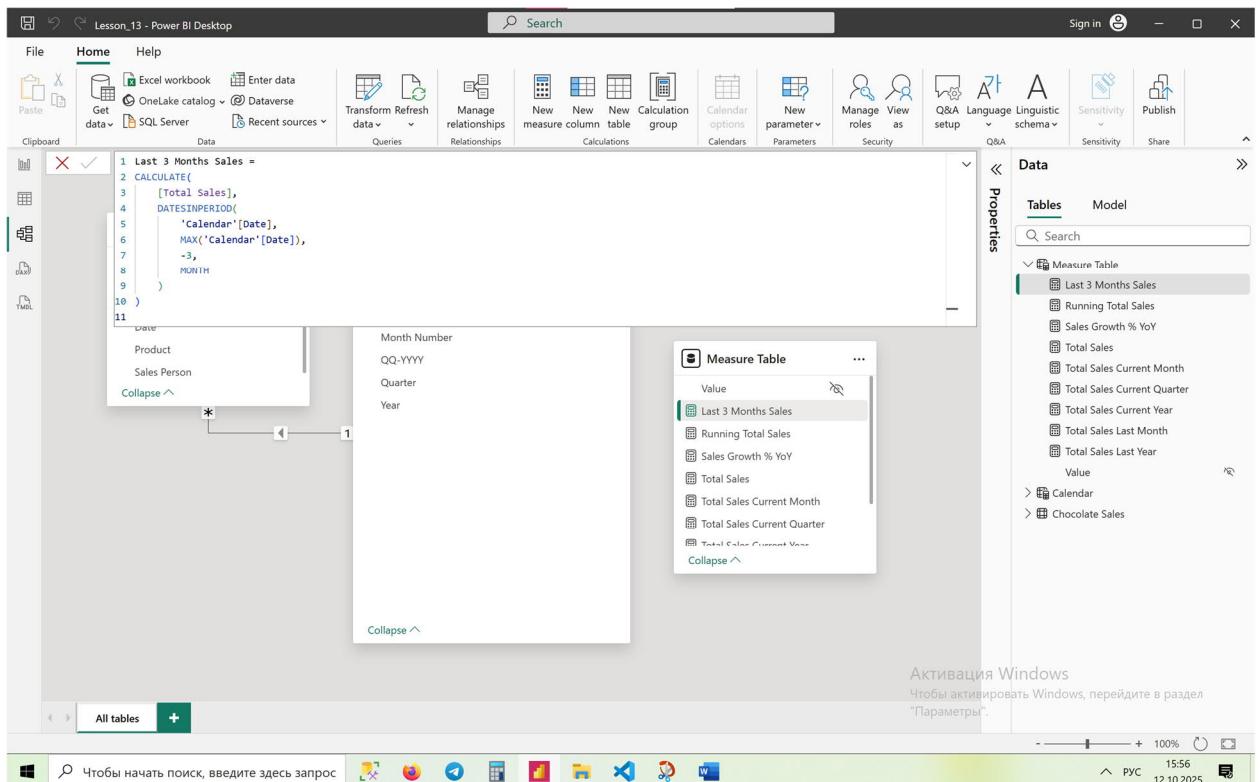
The table includes the following columns:

- Total Sales
- Total Sales Current Month
- Total Sales Current Quarter
- Total Sales Current Year
- Total Sales Last Month
- Total Sales Last Year
- Value

The Power BI ribbon is visible at the top, and the Windows taskbar is at the bottom.

9. Create a measure to compute sales for the last 3 months.

Last 3 Months Sales =
VAR LastVisibleDate = MAX('Calendar'[Date])
RETURN
CALCULATE(
 [Total Sales],
 FILTER(
 ALL('Calendar'),
 'Calendar'[Date] <= LastVisibleDate &&
 'Calendar'[Date] > EDATE(LastVisibleDate, -3)
)
)
)



10. Create a measure to identify the month with the highest sales in the previous 12 months.

Month with Highest Sales (Last 12 Months) =

VAR LastVisibleDate = MAX('Calendar'[Date])

VAR Last12Months =

DATESINPERIOD('Calendar'[Date], LastVisibleDate, -12, MONTH)

VAR SummaryTable =

ADDCOLUMNS(

SUMMARIZE('Calendar', 'Calendar'[Year], 'Calendar'[Month Name]),
"@Sales", CALCULATE([Total Sales], KEEPFILTERS(Last12Months))

)

VAR TopMonth =

TOPN(1, SummaryTable, [@Sales], DESC)

RETURN

CONCATENATEX(TopMonth, 'Calendar'[Month Name] & " " & 'Calendar'[Year],
", ")

The screenshot shows the Power BI Desktop interface with the following details:

- File** tab selected.
- Clipboard** pane on the left.
- Data** pane on the right, showing a list of measures and tables.
- Properties** pane on the far right.
- DAX Editor** pane displaying the following DAX code:

```

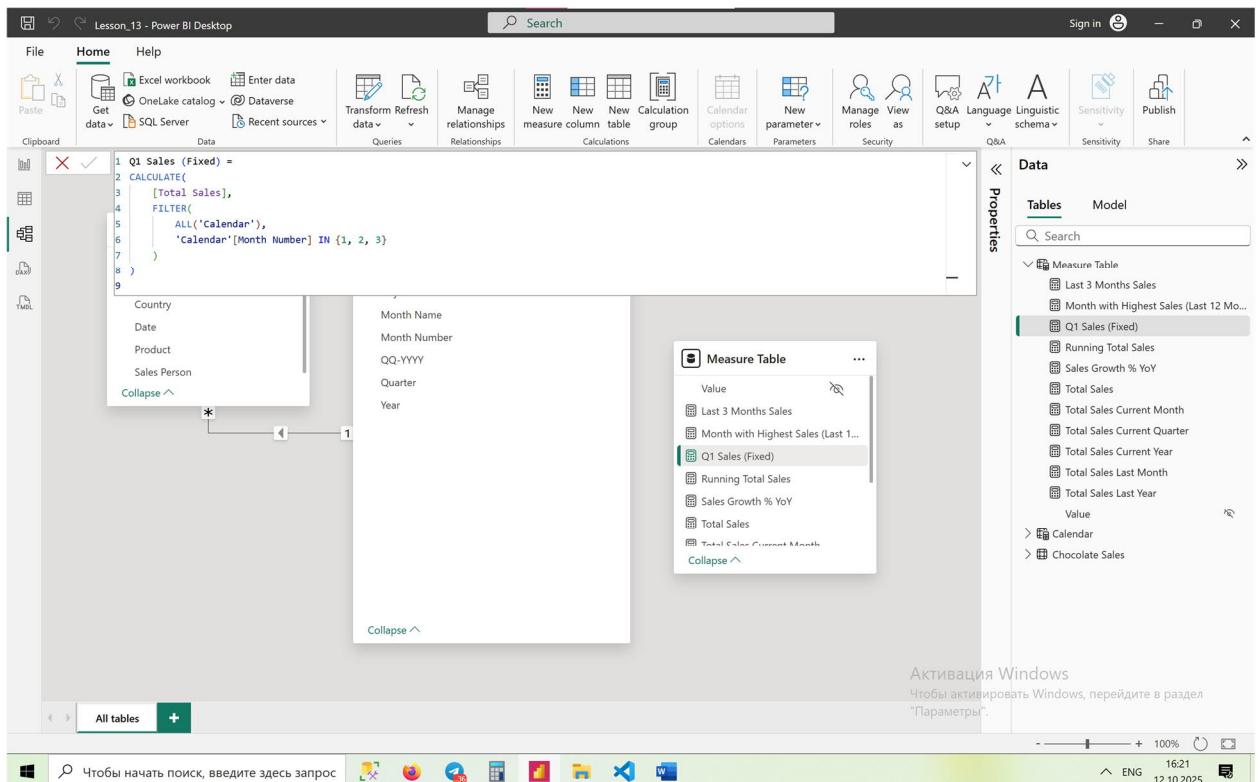
1 Month with Highest Sales (Last 12 Months) =
2 VAR LastVisibleDate = MAX('Calendar'[Date])
3 VAR Last12Months =
4     DATESINPERIOD('Calendar'[Date], LastVisibleDate, -12, MONTH)
5 VAR SummaryTable =
6     ADDCOLUMNS(
7         SUMMARIZE('Calendar', 'Calendar'[Year], 'Calendar'[Month Name]),
8         "@Sales", CALCULATE([Total Sales], KEEPFILTERS(Last12Months))
9     )
10 VAR TopMonth =
11     TOPN(1, SummaryTable, [@Sales], DESC)
12 RETURN
13 CONCATENATE(TopMonth, 'Calendar'[Month Name] & " " & 'Calendar'[Year], ", ")
14
    
```

- Value** dropdown in the Properties pane is expanded, showing options like "Last 3 Months Sales", "Month with Highest Sales (Last 12 Mo...)", etc.
- Taskbar** at the bottom includes icons for Start, Search, Task View, File Explorer, Task Manager, and others.

Advanced (11–15)

11. Create a measure to compare Q1 Sales of Each Year. Use time intelligence functions with filters to isolate and compare Q1 across years.

Q1 Sales (Fixed) =
CALCULATE(
 [Total Sales],
FILTER(
 ALL('Calendar'),
 'Calendar'[Month Number] IN {1, 2, 3}
)
)



12. Create a measure to Show YoY Difference Only for December.

December Sales YoY Difference =

VAR CurrentYear = MAX('Calendar'[Year])

VAR CurrentDec =

```

CALCULATE(
    [Total Sales],
    'Calendar'[Year] = CurrentYear,
    'Calendar'[Month Number] = 12
)

```

VAR PreviousDec =

```

CALCULATE(
    [Total Sales],
    'Calendar'[Year] = CurrentYear - 1,
    'Calendar'[Month Number] = 12
)

```

RETURN

CurrentDec - PreviousDec

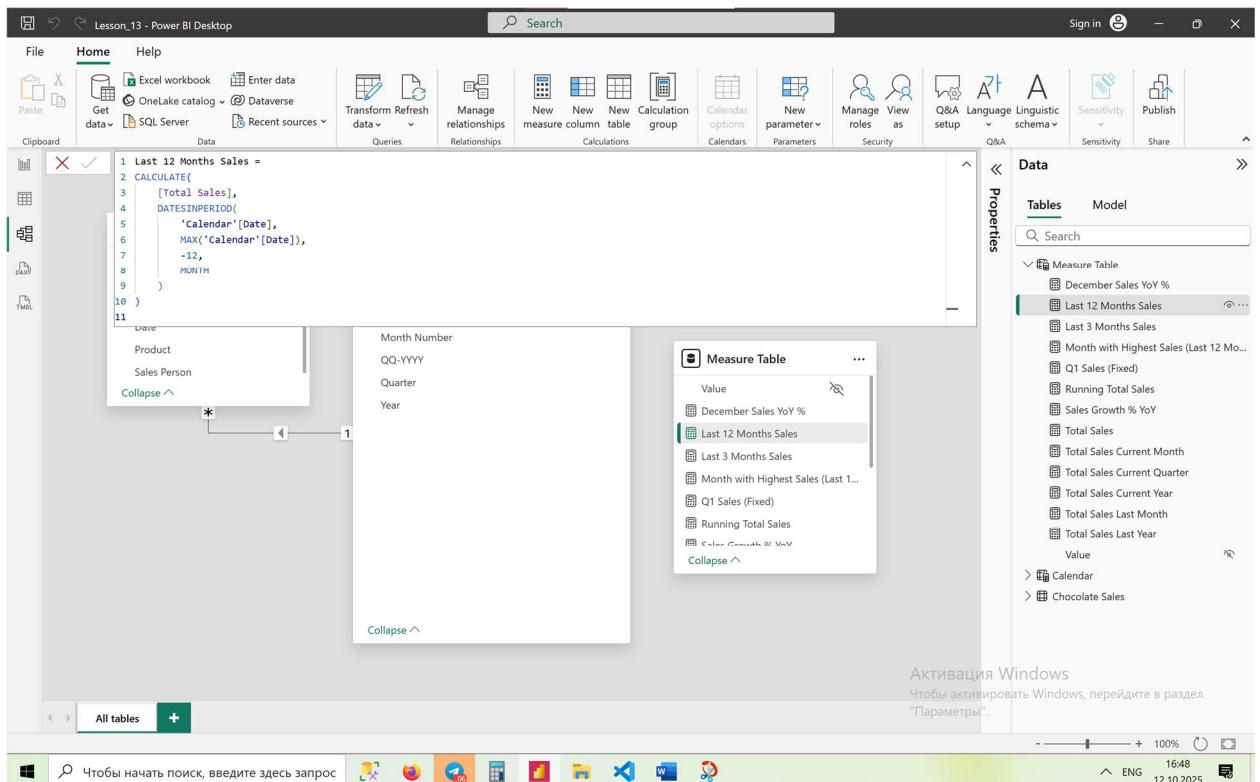
The screenshot shows the Power BI Desktop interface with the following details:

- Clipboard:** Contains the DAX code for the measure.
- Home ribbon:** Includes tabs for File, Home, Help, Data, Queries, Relationships, Calculations, Calendars, Parameters, Security, Q&A, Language setup, Sensitivity, and Publish.
- Properties pane:** Shows the properties for the selected measure, including its name and type.
- Measure Table pane:** Lists various measures such as December Sales YoY Difference, Last 3 Months Sales, Month with Highest Sales, etc.
- Bottom Taskbar:** Includes the Windows Start button, a search bar, pinned application icons (File Explorer, Edge, Firefox, Mail, File Manager, Task View, and Word), and system status indicators (language, battery, time).

13. Create a measure that sums the last 12 months using.

Last 12 Months Sales =

```
CALCULATE(
    [Total Sales],
    DATESINPERIOD(
        'Calendar'[Date],
        MAX('Calendar'[Date]),
        -12,
        MONTH
    )
)
```



14. Create a measure to identify sales Difference Between Current Quarter and Previous Quarter

Quarter Sales Difference =

VAR CurrQtrSales =

```

CALCULATE(
    [Total Sales],
    DATESQTD('Calendar'[Date])
)

```

VAR PrevQtrSales =

```

CALCULATE(
    [Total Sales],
    DATEADD('Calendar'[Date], -1, QUARTER)
)

```

RETURN

CurrQtrSales – PrevQtrSales

The screenshot shows the Power BI Desktop interface with the Q&A pane open. The Q&A pane displays a measure definition:

```

1 Quarter Sales Difference =
2 VAR CurrQtrSales =
3   CALCULATE(
4     [Total Sales],
5     DATESQTD('Calendar'[Date])
6   )
7 VAR PrevQtrSales =
8   CALCULATE(
9     [Total Sales],
10    DATEADD('Calendar'[Date], -1, QUARTER)
11  )
12 RETURN
13 CurrQtrSales - PrevQtrSales
14
  
```

The preview pane shows the results for the measure:

Value	Name
December Sales YoY %	[Quarter Sales Difference]
Last 12 Months Sales	
Last 3 Months Sales	
Month with Highest Sales (Last 1...	
Q1 Sales (Fixed)	
Quarter Sales Difference	
Dimension Total Sales	

The status bar at the bottom indicates "Активация Windows" (Windows Activation) and "Чтобы активировать Windows, перейдите в раздел "Параметры"."

15. Create a measure to highlight Months Where Sales Exceeded Previous Year by 10%+
→ Compare monthly totals and return a flag when current > 110% of last year.

Sales Exceeded Last Year by 10%+ =

VAR CurrMonthSales =

[Total Sales]

VAR PrevMonthSales =

CALCULATE(
[Total Sales],
SAMEPERIODLASTYEAR('Calendar'[Date])

)

VAR GrowthRate =

DIVIDE(CurrMonthSales - PrevMonthSales, PrevMonthSales)

RETURN

IF(GrowthRate > 0.10, " 0% Growth", " Below 10%")

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File Home Help

Clipboard Data

```

1 Sales Exceeded Last Year by 10% =
2 VAR CurrMonthSales =
3   [Total Sales]
4 VAR PrevMonthSales =
5   CALCULATE(
6     [Total Sales],
7     SAMEPERIODLASTYEAR('Calendar'[Date])
8   )
9 VAR GrowthRate =
10  DIVIDE(CurrMonthSales - PrevMonthSales, PrevMonthSales)
11 RETURN
12 IF(GrowthRate > 0.10, "✅ >10% Growth", "❌ Below 10%")
13
  
```

Sales Person
Collapse ^

Quarter
Year

Measure Table

- Value
- December Sales YoY %
- Last 12 Months Sales
- Last 3 Months Sales
- Month with Highest Sales (Last 1...)
- Q1 Sales (Fixed)
- Quarter Sales Difference
- Dimension Total Sales
- Collapse ^

Tables Model

Search

Measure Table

- December Sales YoY %
- Last 12 Months Sales
- Last 3 Months Sales
- Month with Highest Sales (Last 12 Mo...)
- Q1 Sales (Fixed)
- Quarter Sales Difference
- Running Total Sales
- Sales Exceeded Last Year by 10%+ ⚡...
- Sales Growth % YoY
- Total Sales
- Total Sales Current Month
- Total Sales Current Quarter
- Total Sales Current Year
- Total Sales Last Month
- Total Sales Last Year
- Value
- Calendar
- Chocolate Sales

Активация Windows

Чтобы активировать Windows, перейдите в раздел "Параметры".

100%

ENG 17:04 12.10.2025

