Lesson 8 – Answers
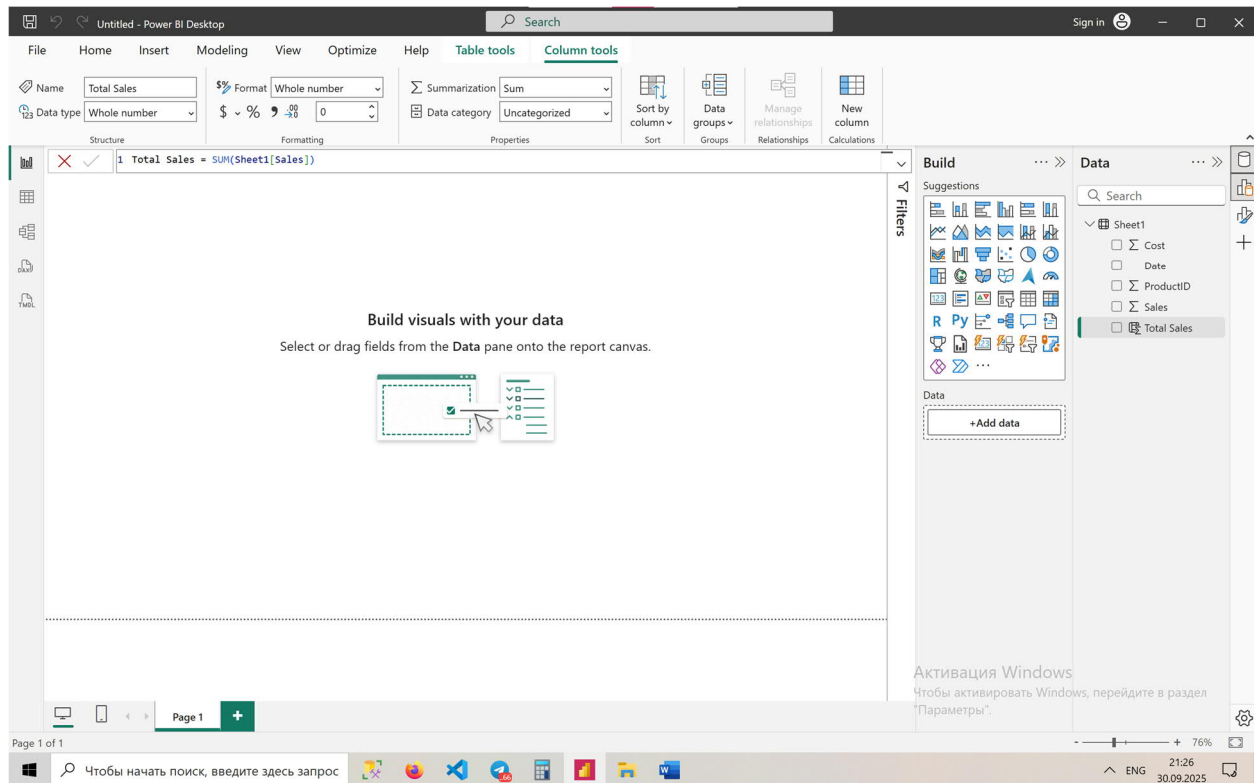
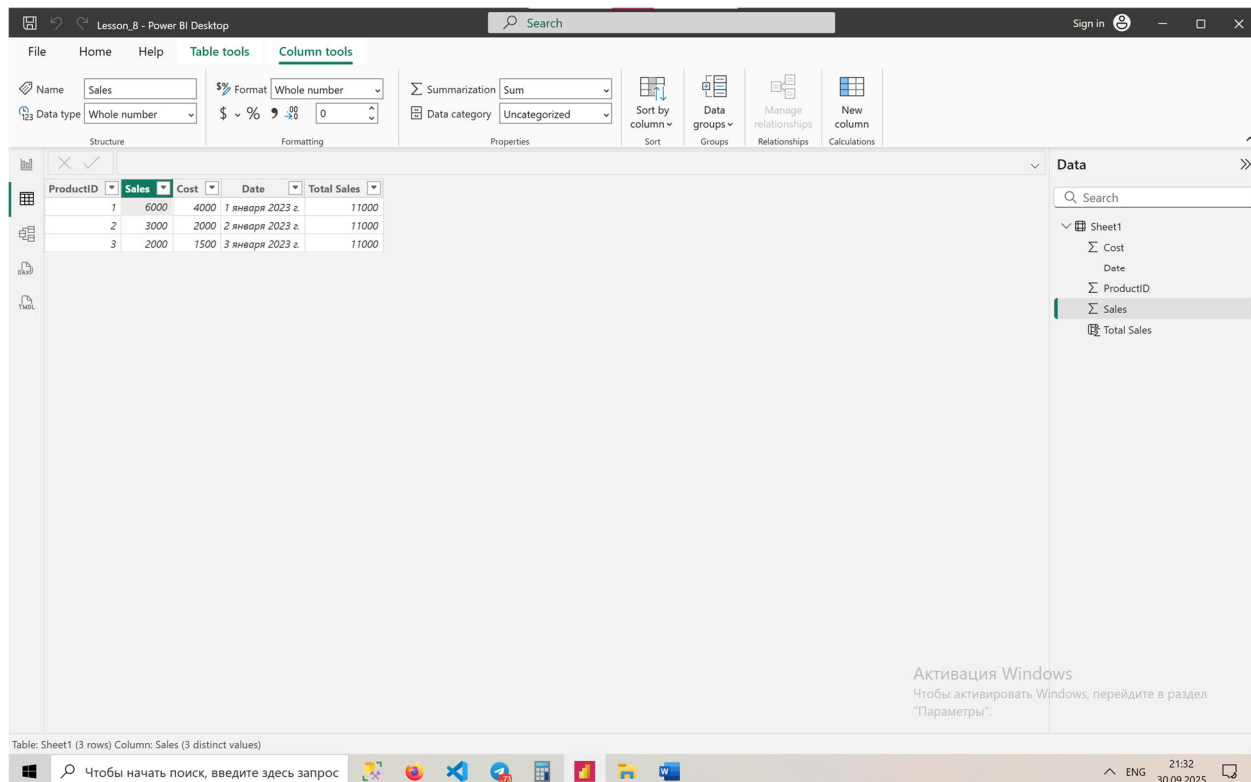**1. What does DAX stand for?**

DAX stands for **Data Analysis Expressions**. It is a formula language used in Power BI, Excel, and Analysis Services to create custom calculations.

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2. Write a DAX formula to sum the Sales column.

Total Sales = SUM(Sheet1[Sales])

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3. What is the difference between a calculated column and a measure?

- A **calculated column** is computed row by row and stored in the data model.
  Profit = Sheet1[Sales] - Sheet1[Cost]
- A **measure** is calculated dynamically based on filters and aggregations in a report.
  Total Profit Measure = SUM(Sheet1[Sales]) - SUM(Sheet1[Cost])

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4. Use the DIVIDE function to calculate Profit Margin (Profit/Sales).

Profit Margin = DIVIDE(SUM(Sheet1[Sales]) - SUM(Sheet1[Cost]), SUM(Sheet1[Sales]))

5. What does COUNTROWS() do in DAX?

COUNTROWS() returns the number of rows in a table or table expression.

Rows = COUNTROWS(Sheet1)

6. Create a measure: Total Profit that subtracts total cost from total sales.

Total Profit = SUM(Sheet1[Sales]) - SUM(Sheet1[Cost])

7. Write a measure to calculate Average Sales per Product.
Average Sales per Product = AVERAGE(Sheet1[Sales])

8. Use IF() to tag products as "High Profit" if Profit > 1000.

High Profit Tag = IF(Sheet1[Sales] - Sheet1[Cost] > 1000, "High Profit", "Low Profit")

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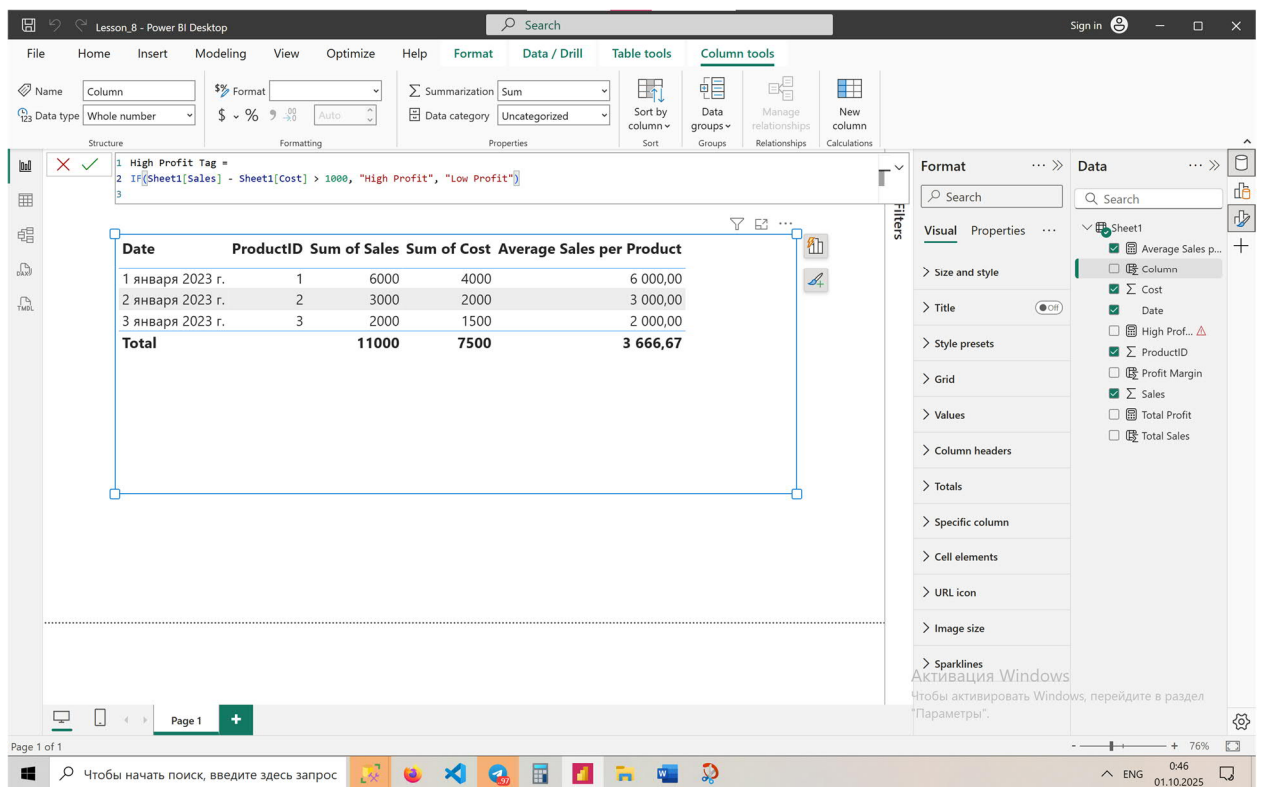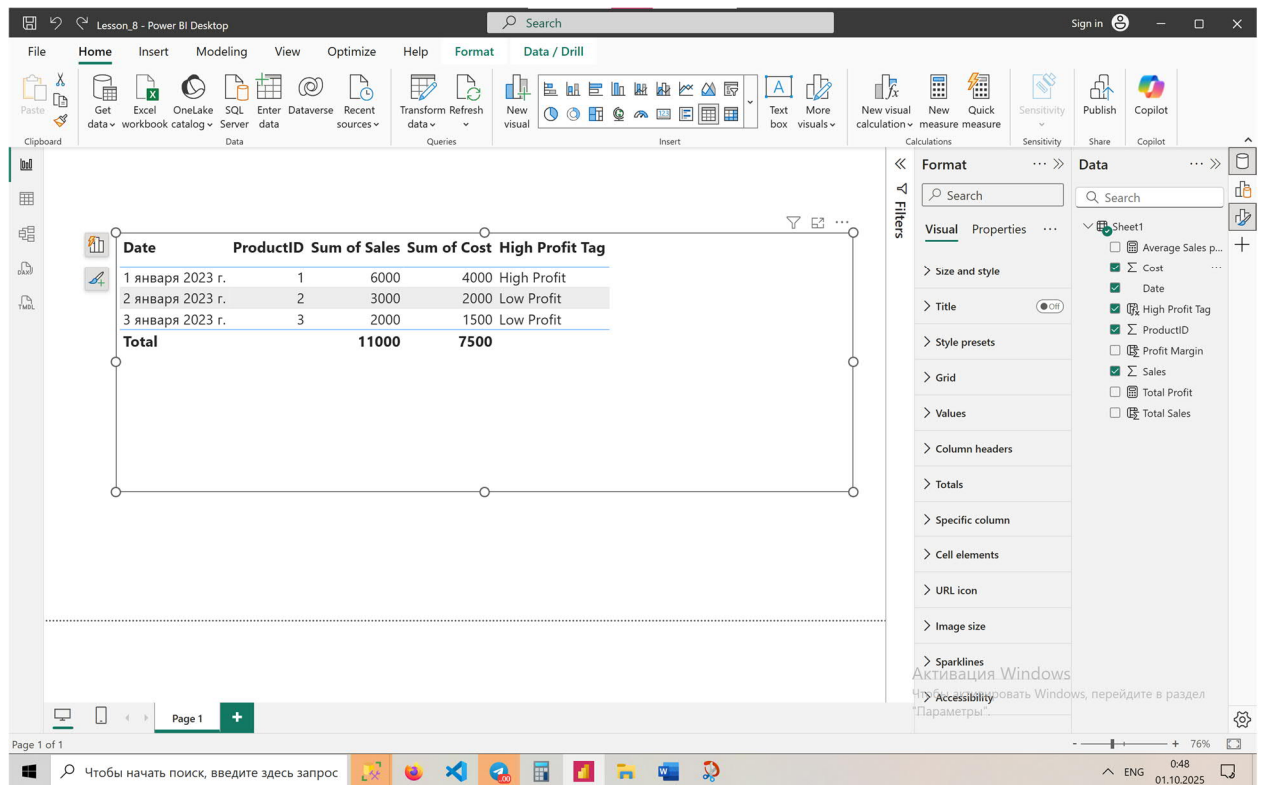
9. What is a circular dependency error in a calculated column?

A circular dependency happens when a column or measure references itself directly or indirectly, creating an endless calculation loop.

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10. Explain row context vs. filter context.

- **Row context**: evaluation happens for each row individually (like in calculated columns).
- **Filter context**: evaluation happens based on filters applied from visuals, slicers, or CALCULATE().

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11. Write a measure to calculate YTD Sales using TOTALYTD().

YTD Sales = TOTALYTD(SUM(Sheet1[Sales]), Sheet1[Date])

12. Create a dynamic measure that switches between Sales, Profit, and Margin.

At first we should create a new table
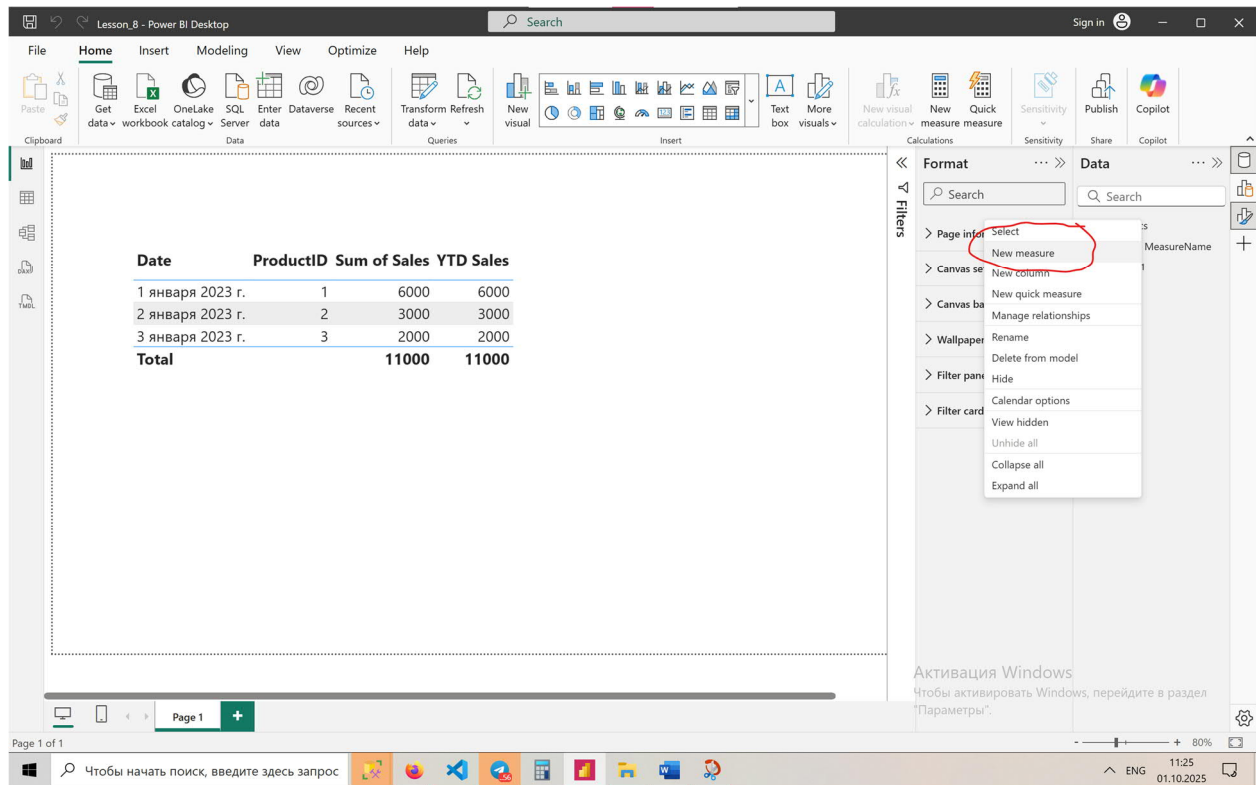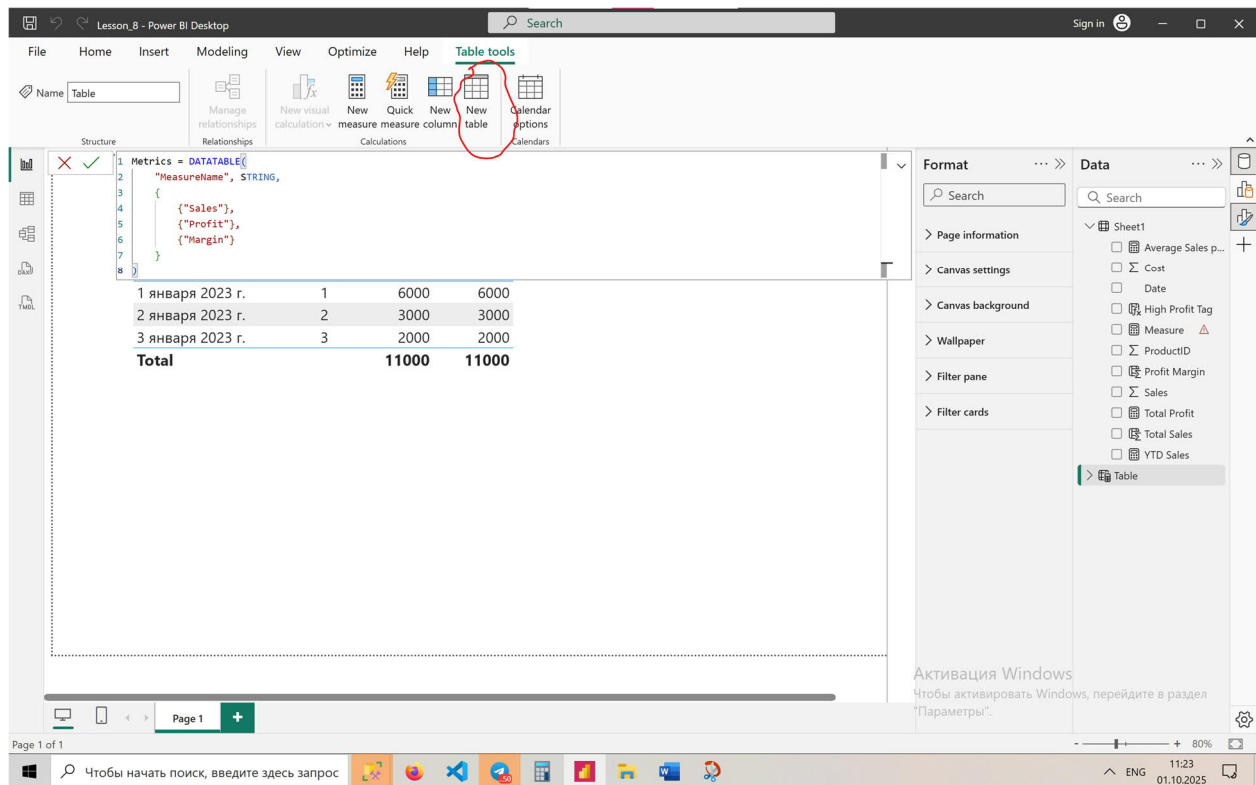
Dynamic Metric =
SWITCH(
   SELECTEDVALUE(Metrics[MeasureName]),
   "Sales", SUM(Sheet1[Sales]),
   "Profit", SUM(Sheet1[Sales]) - SUM(Sheet1[Cost]),

"Margin", DIVIDE(SUM(Sheet1[Sales]) - SUM(Sheet1[Cost]), SUM(Sheet1[Sales]))
)
(Here Metrics is a helper table with values: Sales, Profit, Margin.)
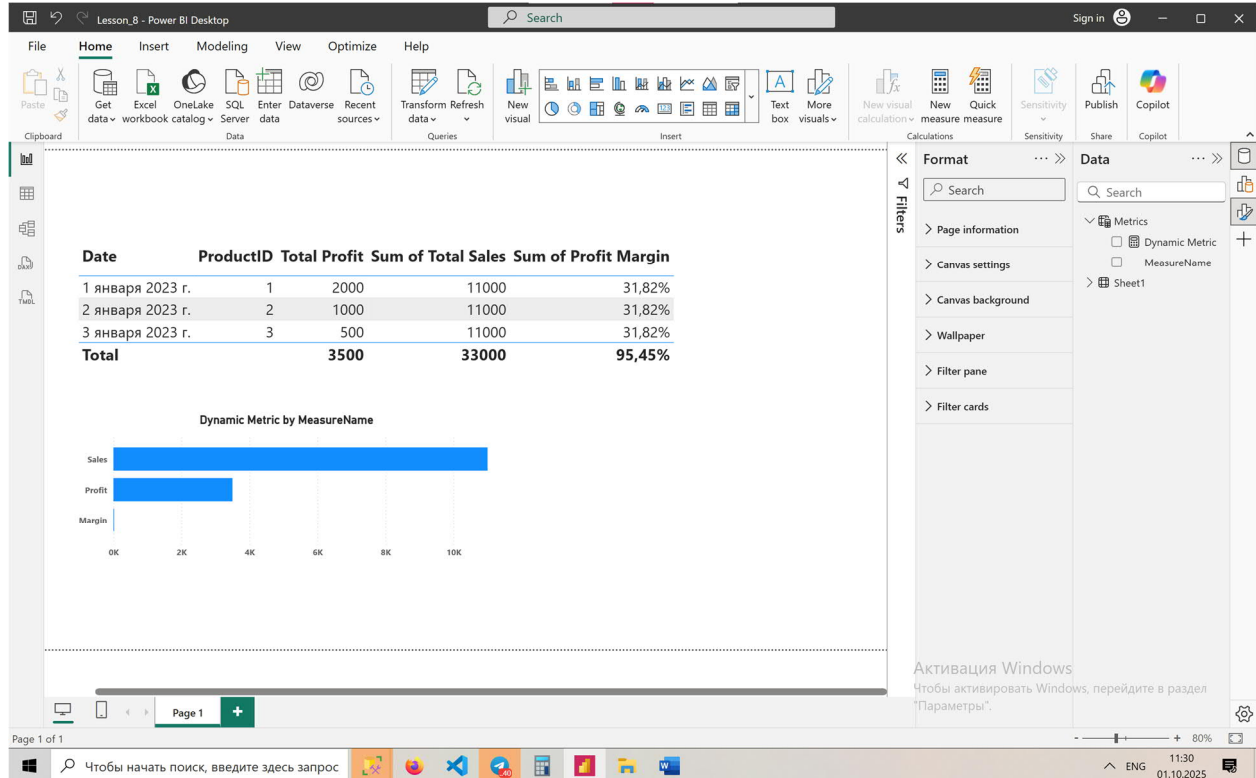
13. Optimize a slow DAX measure using variables (VAR).

Profit Margin Optimized =
VAR TotalSales = SUM(Sheet1[Sales])
VAR TotalCost = SUM(Sheet1[Cost])
RETURN
DIVIDE(TotalSales - TotalCost, TotalSales)

14. Use CALCULATE() to override a filter.

Sales All Products = CALCULATE(SUM(Sheet1[Sales]), ALL(Sheet1[ProductID]))

15. Write a measure that returns the highest sales amount.

Max Sales = MAX(Sheet1[Sales])

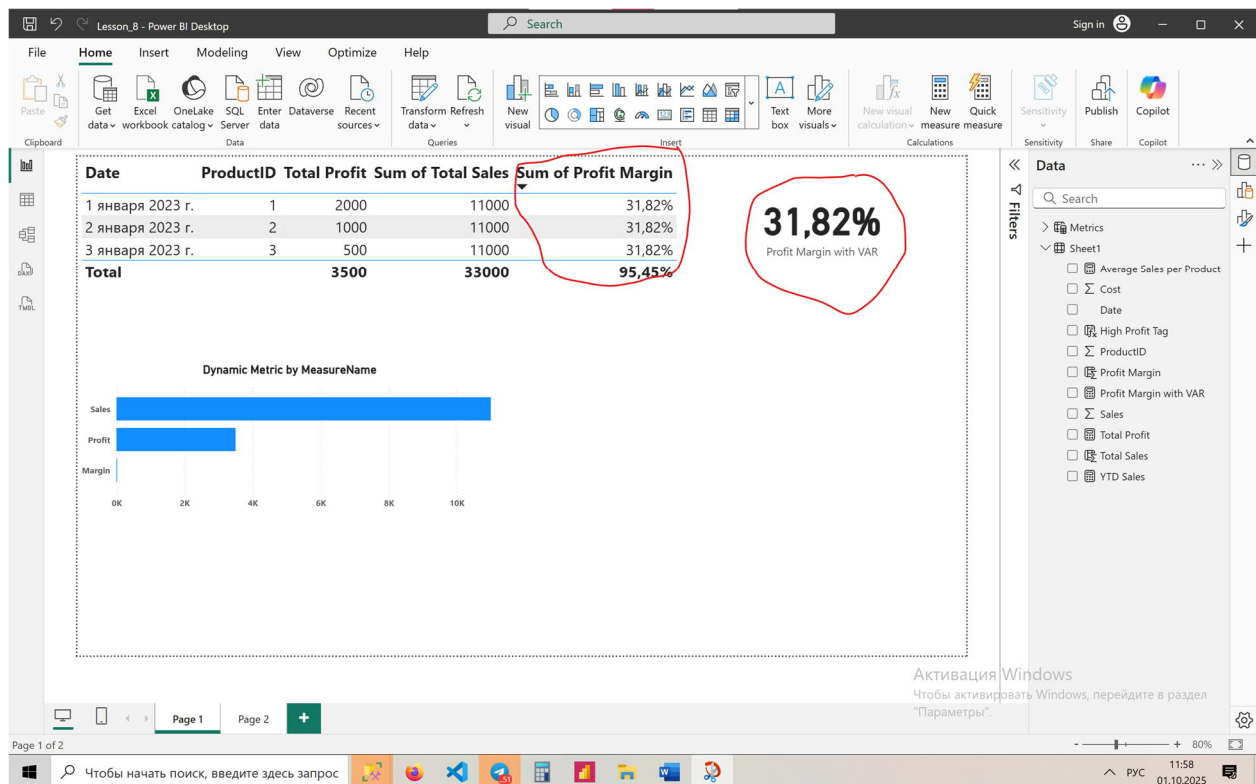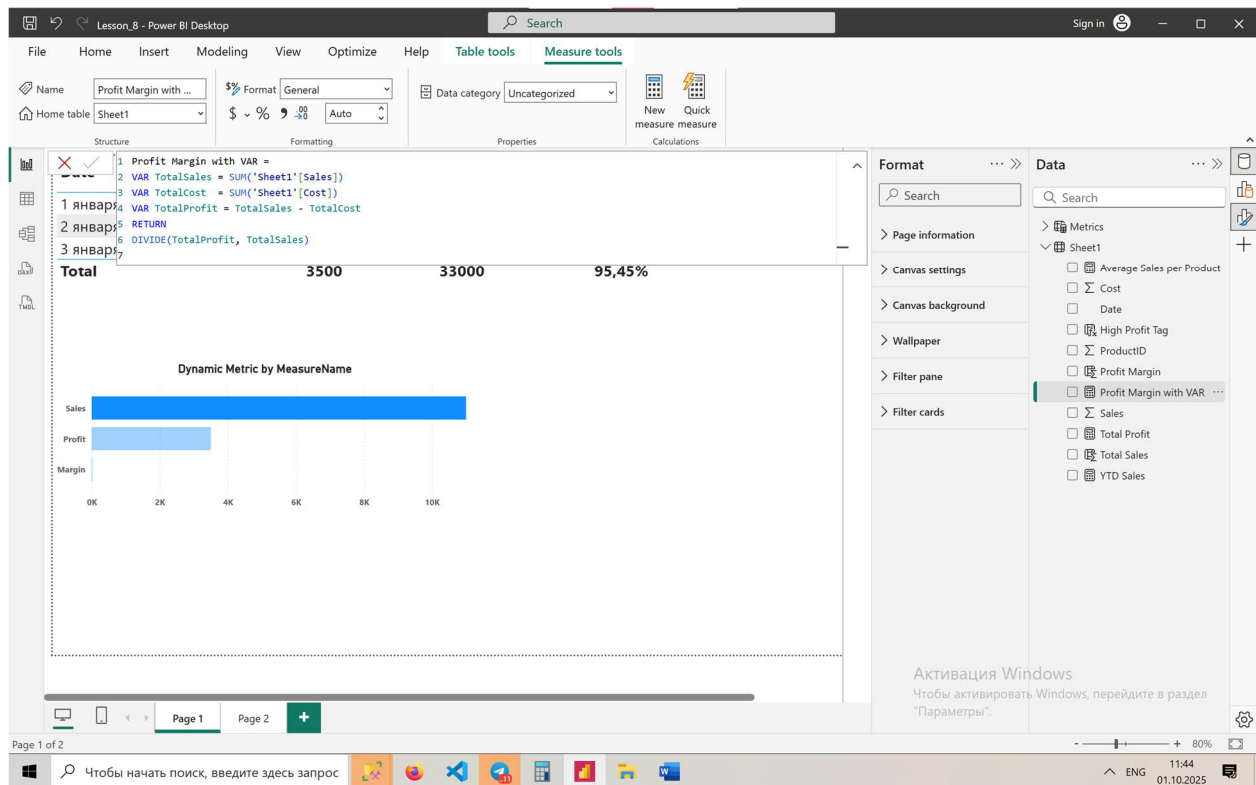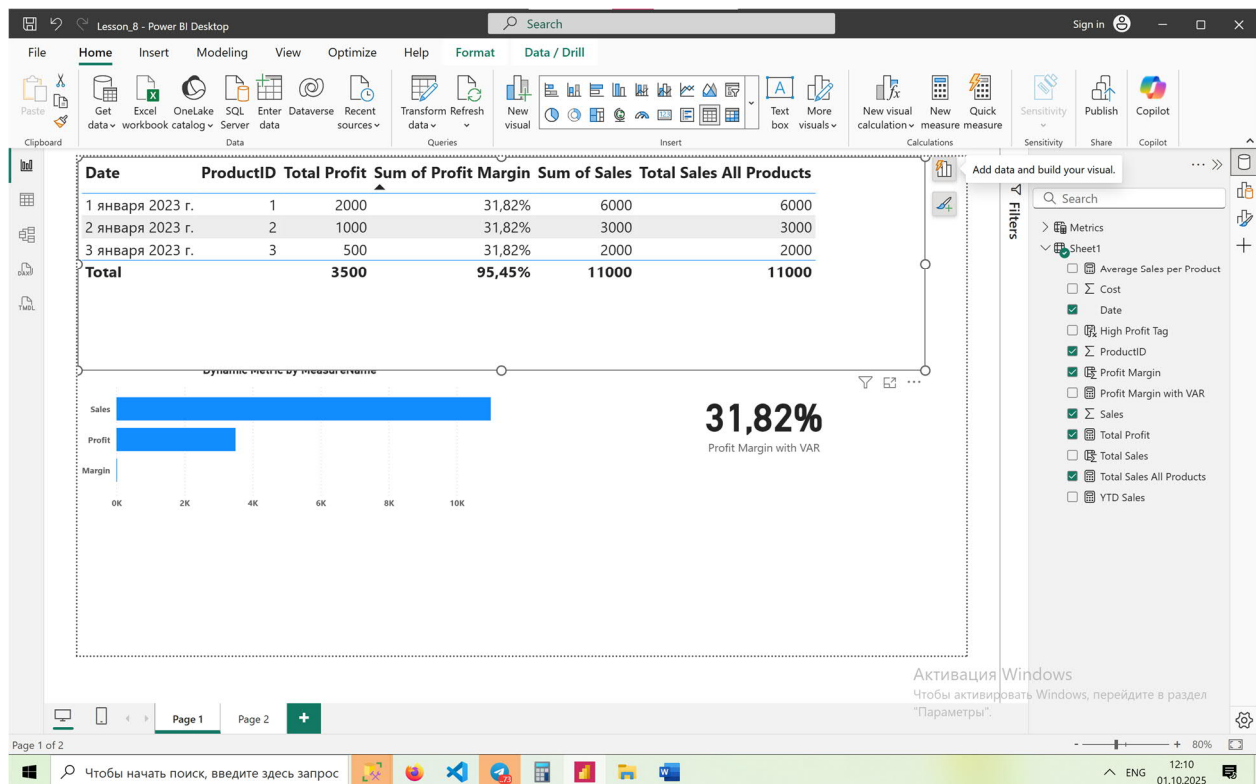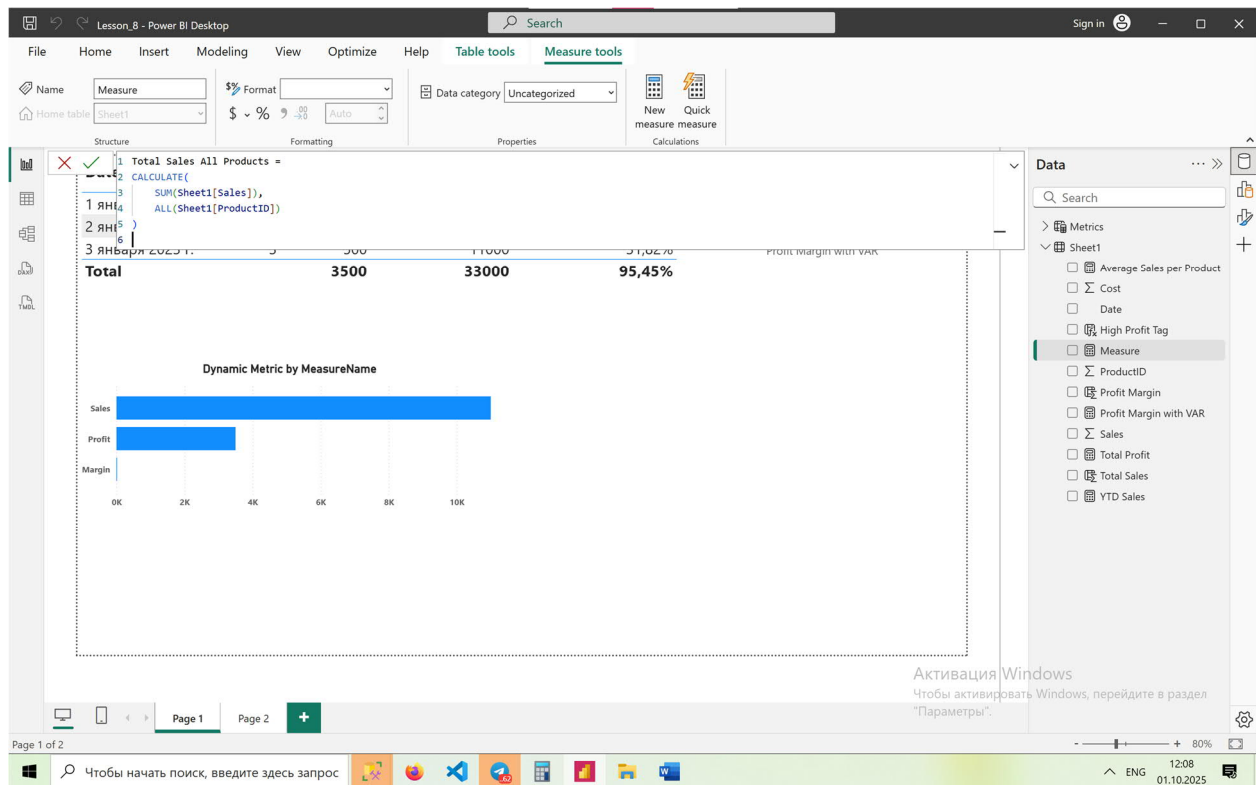File Home Insert Modeling View Optimize Help

Date	ProductID	Total Profit	Sum of Profit Margin	Sum of Sales	Total Sales All Products
1 января 2023 г.	1	2000	31,82%	6000	6000
2 января 2023 г.	2	1000	31,82%	3000	3000
3 января 2023 г.	3	500	31,82%	2000	2000
Total		**3500**	**95,45%**	**11000**	**11000**

Dynamic Metric by MeasureName

Sales
Profit
Margin

0K   2K   4K   6K   8K   10K

31,82%
Profit Margin with VAR

6000
Max Sales

Data

Search

> Metrics
∨ Sheet1
  ☐ Average Sales per Product
  ☐ Σ Cost
  ☐ Date
  ☐ High Profit Tag
  ☐ Max Sales
  ☐ Σ ProductID
  ☐ Profit Margin
  ☐ Profit Margin with VAR
  ☐ Σ Sales
  ☐ Total Profit
  ☐ Total Sales
  ☐ Total Sales All Products
  ☐ YTD Sales

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