Lesson - 8 Homework

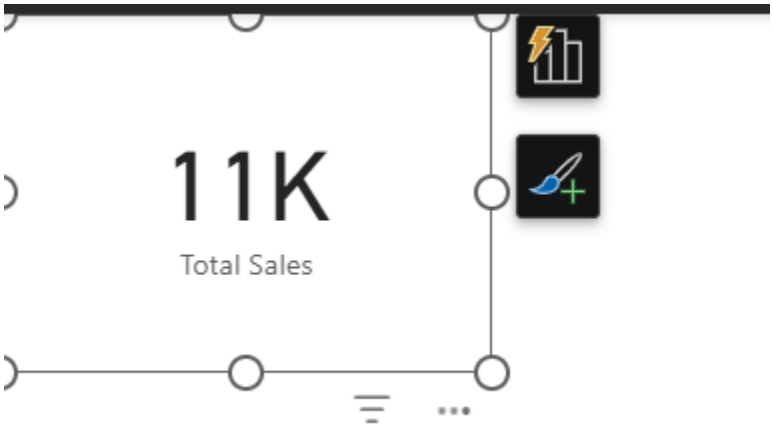
Question 1 : What does DAX stand for?

DAX stands for Data Analysis Expressions.

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

ProductID	Sales	Cost	Date
1	6000	4000	Sunday, January 1, 2023
2	3000	2000	Monday, January 2, 2023
3	2000	1500	Tuesday, January 3, 2023

```
1 Total Sales =
2 SUM(
3     DAX_Practice_Data[Sales]
4 )
```



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

Calculated Column:

What it is: A new, static column added to a table.
When it's calculated: As soon as you create it and then during data refresh. It's stored in the model.
Use it for: Things that belong on each row, like a "Profit" column (Sales - Cost) or categorizing text. It uses row context.

Measure:

What it is: A dynamic calculation, like a total or average.
When it's calculated: On the fly, when you drop it into a report visual. It reacts to filters and slicers.
Use it for: Aggregations, like "Total Sales" or "Average Price". It uses filter context.

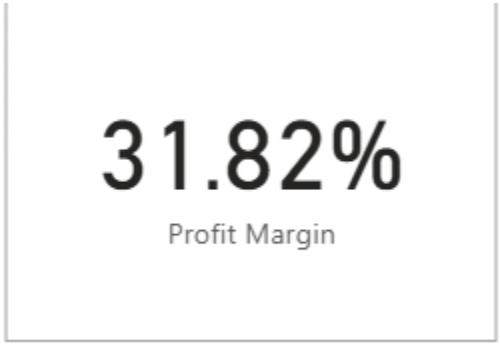
Question 4 : Use the DIVIDE function to calculate Profit Margin (Profit/Sales).

ProductID	Sales	Cost	Date
1	6000	4000	Sunday, January 1, 2023
2	3000	2000	Monday, January 2, 2023
3	2000	1500	Tuesday, January 3, 2023

```
Total Cost =
    SUM(
        DAX_Practice_Data[Cost]
    )
```

```
Total Sales =
SUM(
    DAX_Practice_Data[Sales]
)
```

```
Profit Margin =
    DIVIDE(
        [Total Sales] - [Total Cost], [Total Sales]
    )
```

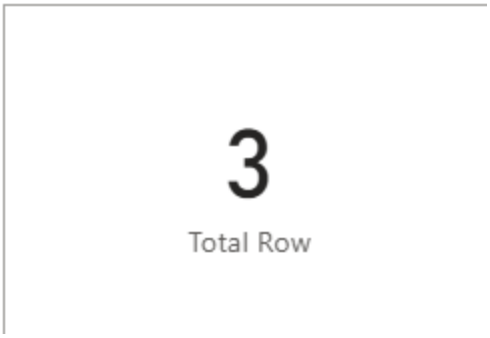


Question 5 : What does COUNTROWS() do in DAX?

It counts the number of rows in a table.

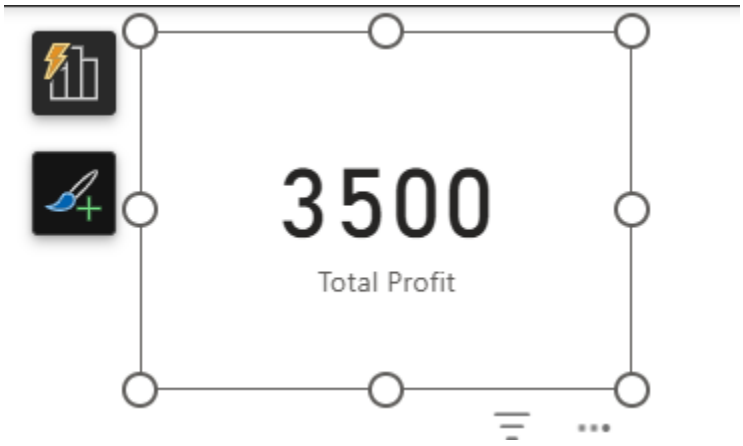
For example, COUNTROWS(Customers) would just tell you how many customer records you have. It's one of the most common ways to count things.

```
Total Row =
    COUNTROWS(
        DAX_Practice_Data
    )
```



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

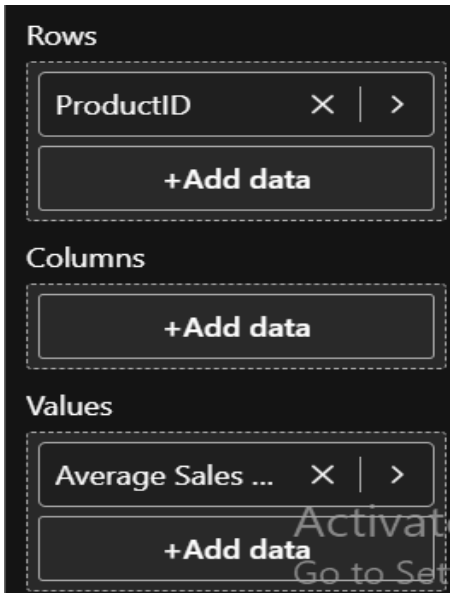
```
Total Profit =
    [Total Sales] - [Total Cost]
```



Question 7 : Write a measure to calculate Average Sales per Product.

```
Average Sales per Product =
AVERAGE(
    DAX_Practice_Data[Sales]
)
```

ProductID	Average Sales per Product
1	6,000.00
2	3,000.00
3	2,000.00
Total	**3,666.67**



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

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

```
Product Tag = IF(
    (DAX_Practice_Data[Sales] - DAX_Practice_Data[Cost]) > 1000,
    "High Profit",
    ""
    )
```

ProductID	Sales	Cost	Date	Product Tag
1	6000	4000	Sunday, January 1, 2023	High Profit
2	3000	2000	Monday, January 2, 2023	
3	2000	1500	Tuesday, January 3, 2023	

Question 9 : What is a circular dependency error in a calculated column?

A circular dependency happens when two calculations depend on each other, creating an infinite loop.

Simple example:

You create a calculated column A that uses column B in its formula.

You then create another calculated column B that uses column A in its formula.

Now, to calculate A, DAX needs B, but to calculate B, it needs A. It can't resolve it, so it throws the error.

Question 10 : Explain row context vs. filter context.

Row Context:

What it is: It's like "reading the current row" in a table.

Where it is: Primarily in calculated columns. When DAX is calculating a new value for each row, it automatically has a row context.

Simple Example: In a calculated column for Profit, the formula = [Sales] - [Cost] knows to use the Sales and Cost values from that specific row.

Filter Context:

What it is: It's the "filters and slicers" that are currently applied to your report.

Where it is: Primarily in measures and when you interact with visuals (slicers, filters, rows/columns in a matrix).

Simple Example: You have a Total Sales measure. When you put it in a visual and select "2024" in a slicer, the filter context is "Year = 2024". The measure then only sums the sales for that year.

The Key Difference:

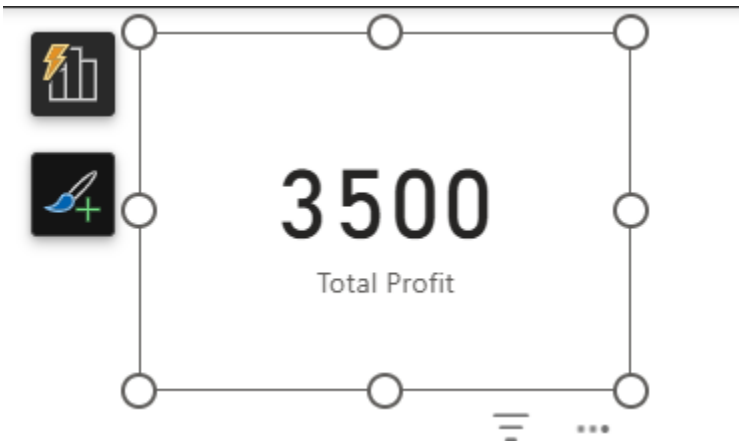
Row Context is about which row you're on.

Filter Context is about which set of rows you're looking at in your report.

Row Context:

ProductID	Sales	Cost	Date	Product Tag
1	6000	4000	Sunday, January 1, 2023	High Profit
2	3000	2000	Monday, January 2, 2023	
3	2000	1500	Tuesday, January 3, 2023	

Filter Context:

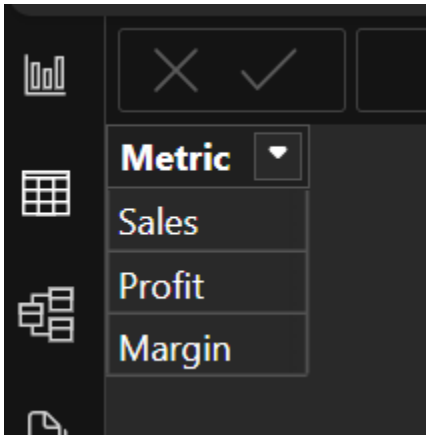


Question 11 : Write a measure to calculate YTD Sales using TOTALYTD().

```
YTD Sales = TOTALYTD(
    SUM(DAX_Practice_Data[Sales]), DAX_Practice_Data[Date] )
```

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

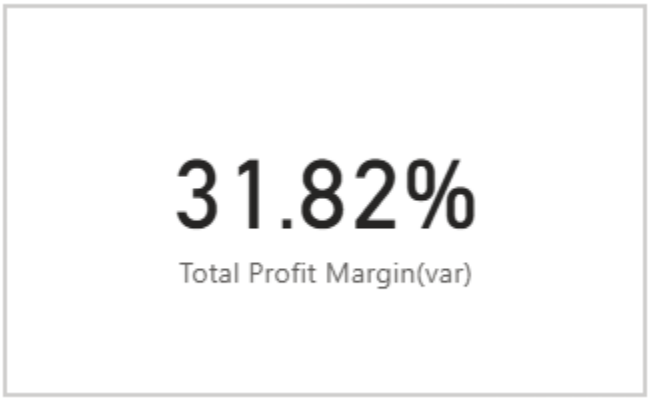
You need to create a separate table (like 'Metric Table') with the options: "Sales", "Profit", "Margin". Use that table as a slicer. When you pick an option, this measure switches the calculation.




```
Selected Metric =
SWITCH(
    TRUE(),
    SELECTEDVALUE('Metric Table'[Metric]) = "Sales", [Total Sales],
    SELECTEDVALUE('Metric Table'[Metric]) = "Profit", [Total Profit],
    SELECTEDVALUE('Metric Table'[Metric]) = "Margin", [Profit Margin],
    BLANK()
)
```

Question 13 : Optimize a slow DAX measure using variables (VAR).

```
Total Profit Margin(var) =
VAR TotalSales = SUM(DAX_Practice_Data[Sales])
VAR TotalCost = SUM(DAX_Practice_Data[Cost])
VAR TotalProfit = TotalSales - TotalCost
RETURN
DIVIDE(TotalProfit, TotalSales)
```



Question 14 : Use CALCULATE() to override a filter

Show Total Sales for ALL products, even when one is selected:

```
Total Sales All =
CALCULATE(
    [Total Sales],
    ALL('DAX_Practice_Data'[ProductID])
)
```

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

```
Highest Sales =
MAX(
    DAX_Practice_Data[Sales]
)
```

VIEW :