Lesson-8

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**1. What does DAX stand for?**

**DAX = Data Analysis Expressions**
It's a formula language used in Power BI, Power Pivot, and SSAS to perform calculations on data.

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

dax

Total Sales = SUM(Sheet1[Sales])

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

- **Calculated Column**: Adds a new column to the table. Calculated row by row. Uses **row context**.
- **Measure**: Calculated on aggregation or visuals. Evaluated at query time. Uses **filter context**.

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

dax

Profit Margin = DIVIDE(SUM(Sheet1[Profit]), SUM(Sheet1[Sales]), 0)

(Third argument 0 is the alternate result if division by zero occurs.)

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**5. What does COUNTROWS() do in DAX?**

It counts the number of rows in a table.

dax

Row Count = COUNTROWS(Sheet1)

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

dax

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

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**7. Write a measure to calculate Average Sales per Product**

dax

```
Avg Sales per Product = AVERAGEX(VALUES(Sheet1[Product]), SUM(Sheet1[Sales]))
```

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

dax

```
Profit Tag = IF(Sheet1[Profit] > 1000, "High Profit", "Low Profit")
```

(Use in a **calculated column**.)

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

It occurs when a column refers to itself (directly or indirectly), causing an endless loop. For example, Column A depends on Column B, which again depends on Column A.

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**10. Explain row context vs. filter context**

- **Row Context**: Each row is evaluated individually (used in calculated columns).
- **Filter Context**: Filters from visuals or slicers (used in measures).

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

dax

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

(Requires a proper **Date Table**.)

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

First, create a disconnected table:

dax

Metric Selector = DATATABLE("Metric", STRING, {{"Sales"}, {"Profit"}, {"Margin"}})

Then, a dynamic measure:

dax

```
Dynamic Metric =
SWITCH(
    SELECTEDVALUE('Metric Selector'[Metric]),
    "Sales", SUM(Sheet1[Sales]),
    "Profit", SUM(Sheet1[Profit]),
    "Margin", DIVIDE(SUM(Sheet1[Profit]), SUM(Sheet1[Sales]))
)
```

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

Example:

dax

```
Optimized Profit Margin =
VAR TotalSales = SUM(Sheet1[Sales])
VAR TotalProfit = SUM(Sheet1[Profit])
RETURN DIVIDE(TotalProfit, TotalSales, 0)
```

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**14. Use CALCULATE() to override a filter**

dax

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```
East Sales = CALCULATE(SUM(Sheet1[Sales]), Sheet1[Region] = "East")
```

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

dax

```
Max Sales = MAX(Sheet1[Sales])
```

Or if Sales is aggregated:

dax

```
Max Sales by Product = MAXX(VALUES(Sheet1[Product]), SUM(Sheet1[Sales]))
```