DA-100 Analyzing Data with Power BI - 5

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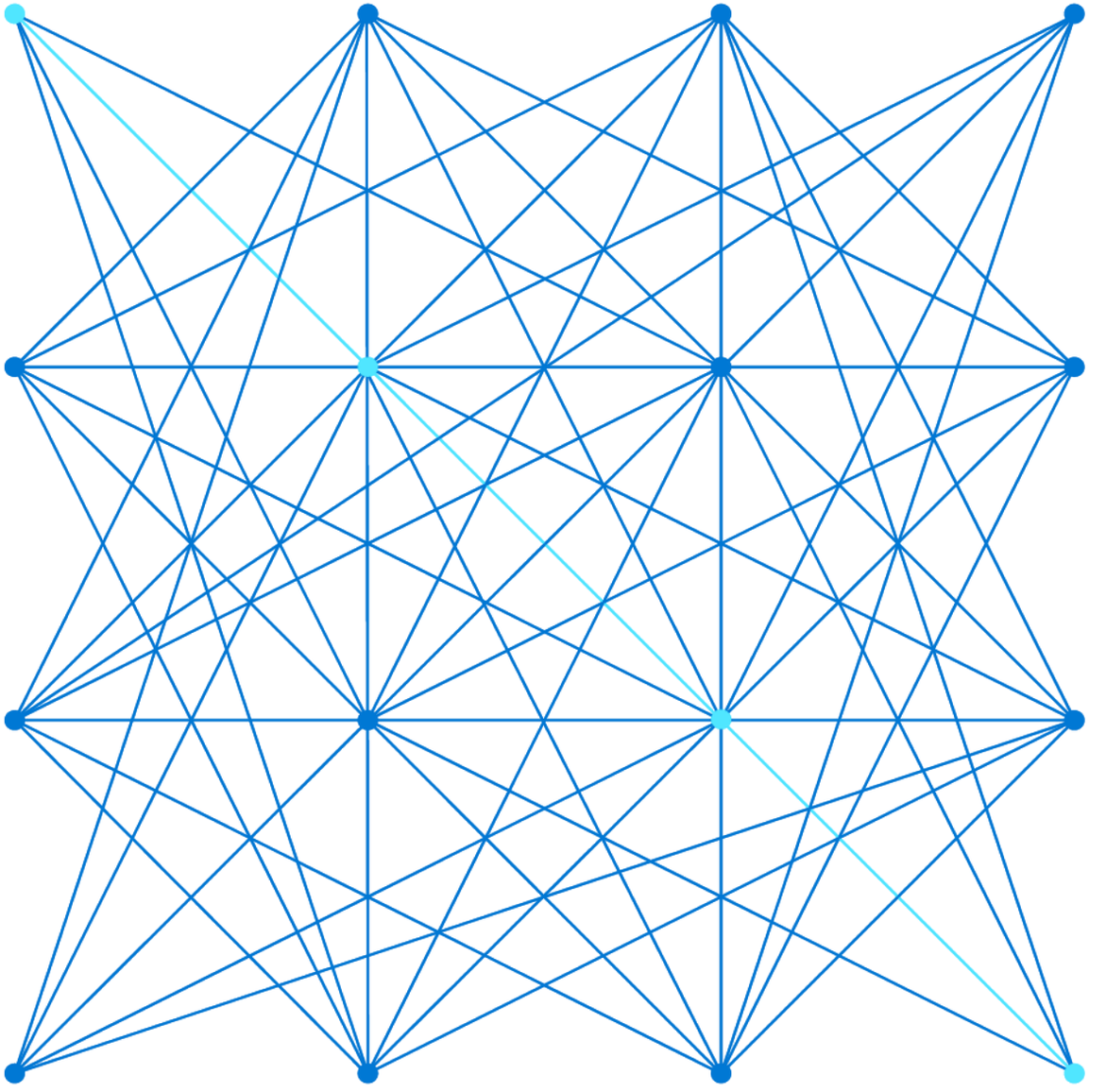

Module 5: Create Model Calculations using DAX in Power BI

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Learning Objectives

You will learn the following concepts:

- DAX
  - Measures
  - Calculated columns
  - Context
  - Time-Intelligence

Lesson 1:
Introduction to DAX

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Introduction to DAX

- Data Analysis Expressions (DAX).
- Developed by Microsoft.
- A library of functions and operators.
- Build formulas and expressions.
- Create calculated tables, columns, and measures.

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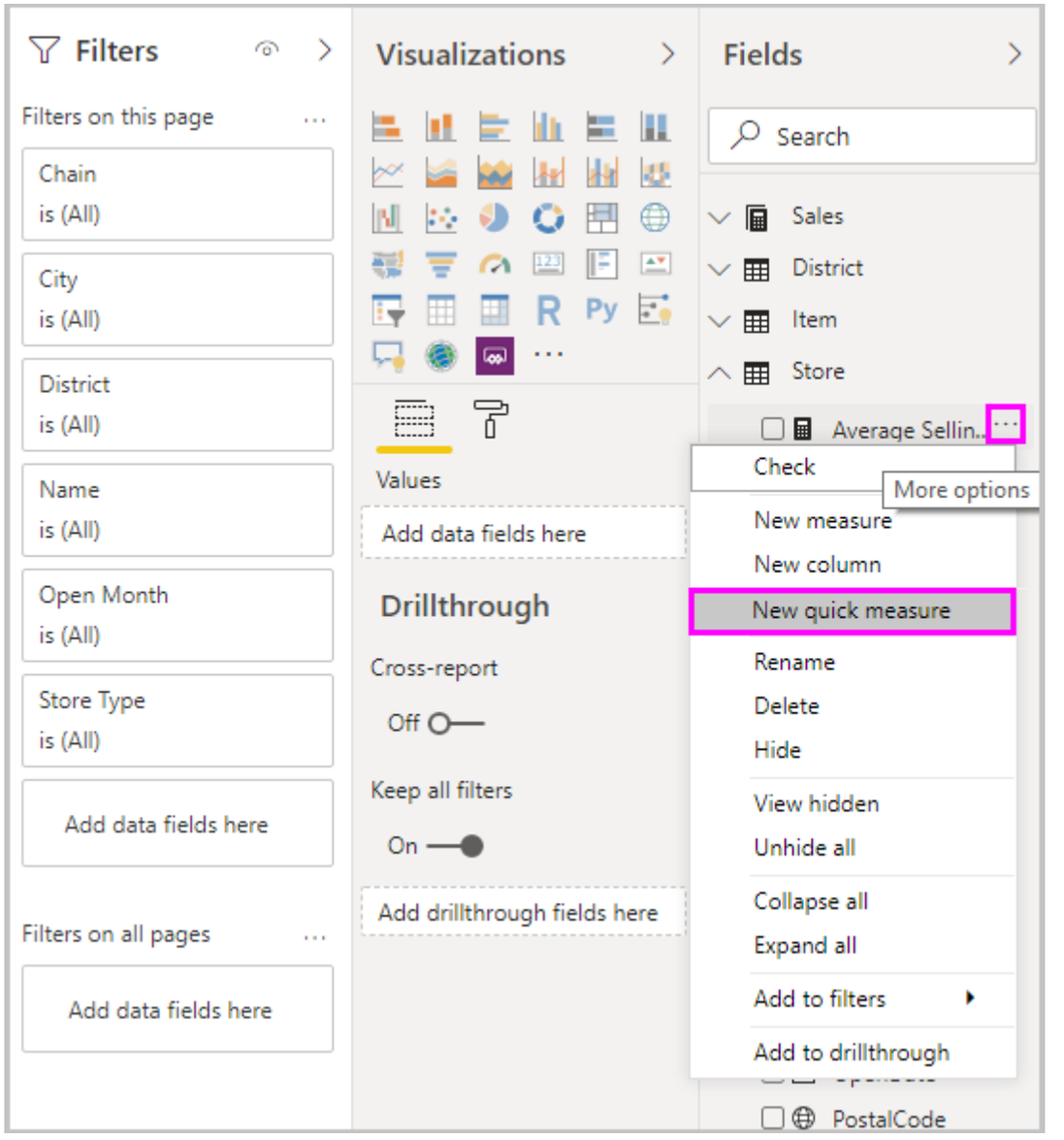
Measures

- Measures are a summarization of data.
- A way of defining aggregate calculations on data.
- Often called “Calculated Measures”.



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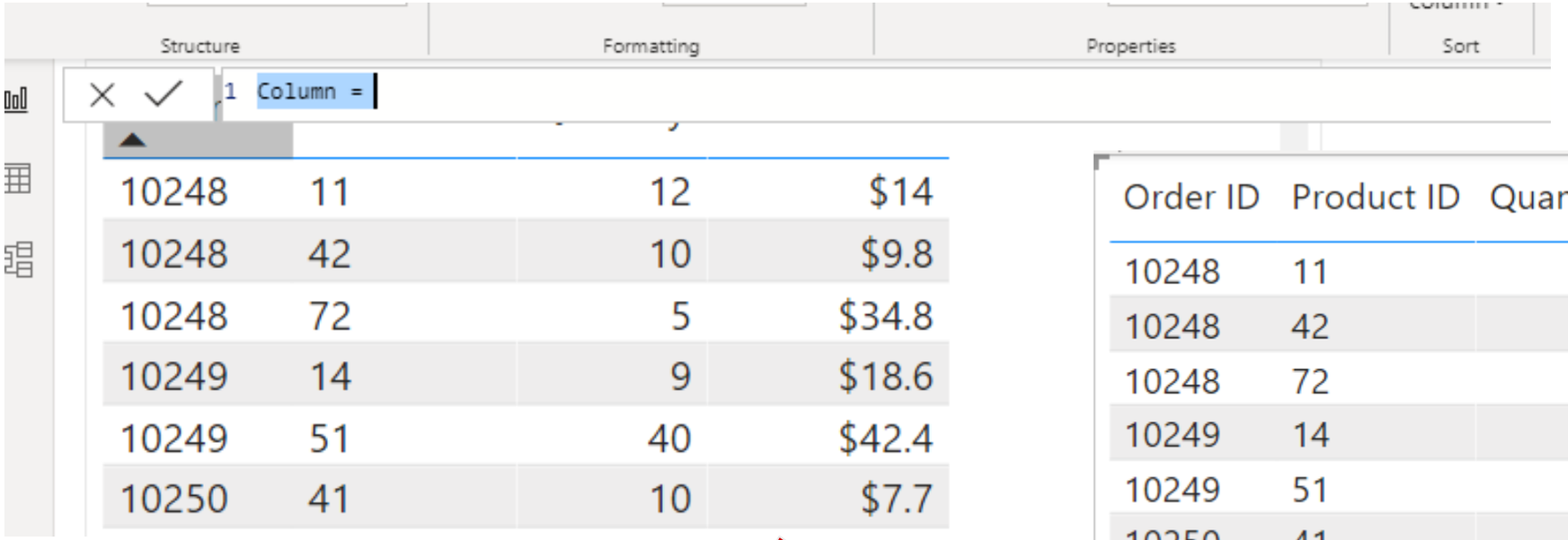
Calculated Columns



10248	11	12	$14
10248	42	10	$9.8
10248	72	5	$34.8
10249	14	9	$18.6
10249	51	40	$42.4
10250	41	10	$7.7

Total Price = 'Sales OrderDetails'[Quantity] * 'Sales OrderDetails'[Unit Price]

Order ID	Product ID	Quantity	Unit Price	Total Price
10248	11	12	$14	$168
10248	42	10	$9.8	$98
10248	72	5	$34.8	$174
10249	14	9	$18.6	$167.4
10249	51	40	$42.4	$1,696
10250	41	10	$7.7	$77
10250	51	35	$42.4	$1,484
10250	65	15	$16.8	$252
10251	22	6	$16.8	$100.8
10251	57	15	$15.6	$234
10251	65	20	$16.8	$336
10252	20	40	$64.8	$2,592
10252	33	25	$2	$50
10252	60	40	$27.2	$1,088

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Columns vs. Measures

- Calculated column creates a value for each row in a table.
- Calculated column values are stored in the Power BI .pbix file.
- Measures are calculated on demand.
- Measures are calculated based on filters.

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Review Questions

- Q01 – Which are calculated on demand? Calculated columns or Measures?
- A01 – Measures

- Q02 – Which are based on filters? Calculated columns or Measures based?
- A01 – Measures

Lesson 2:
DAX Content

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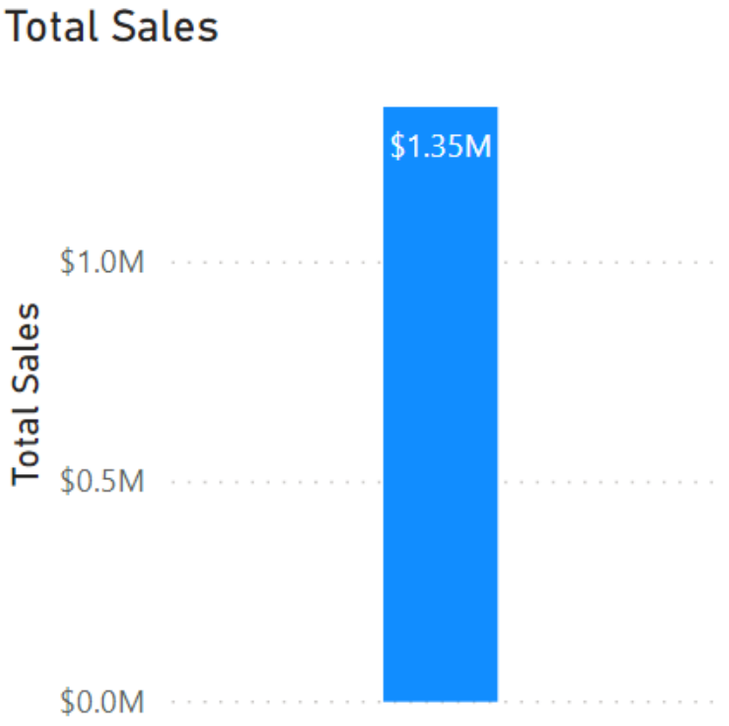
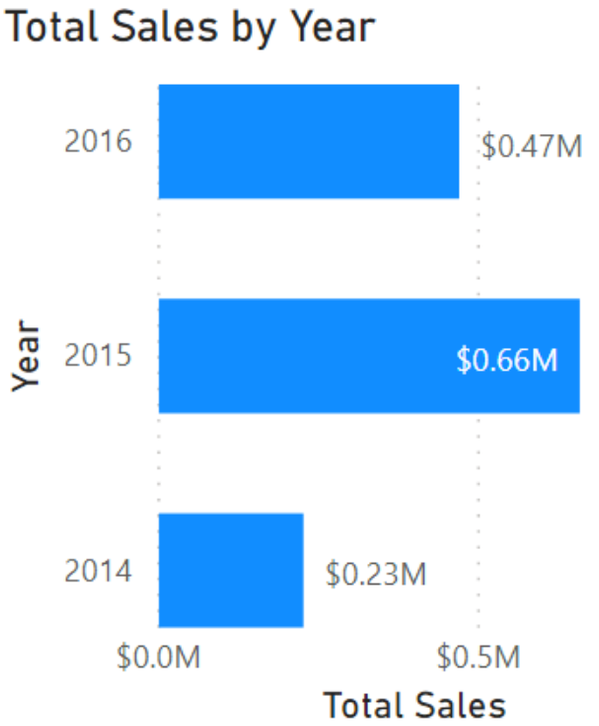
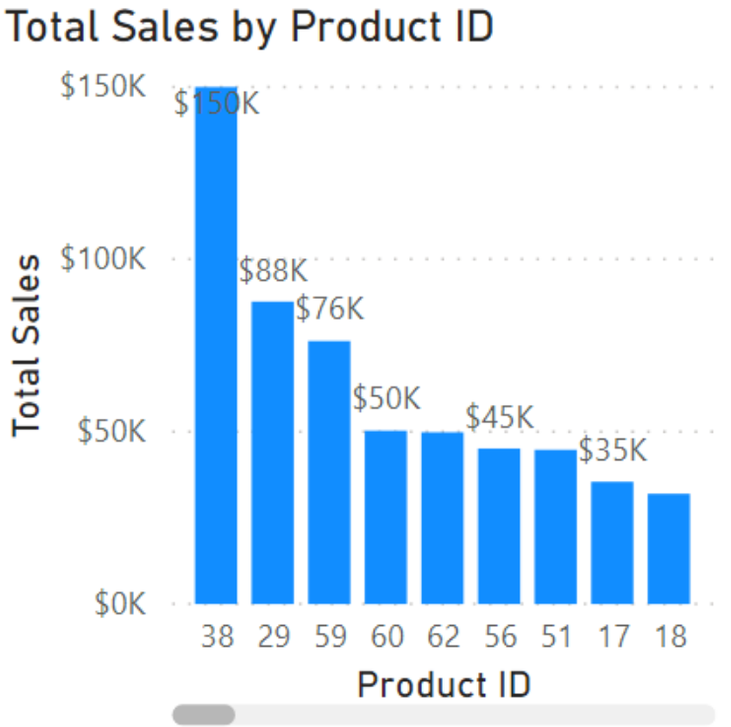
Understanding Context







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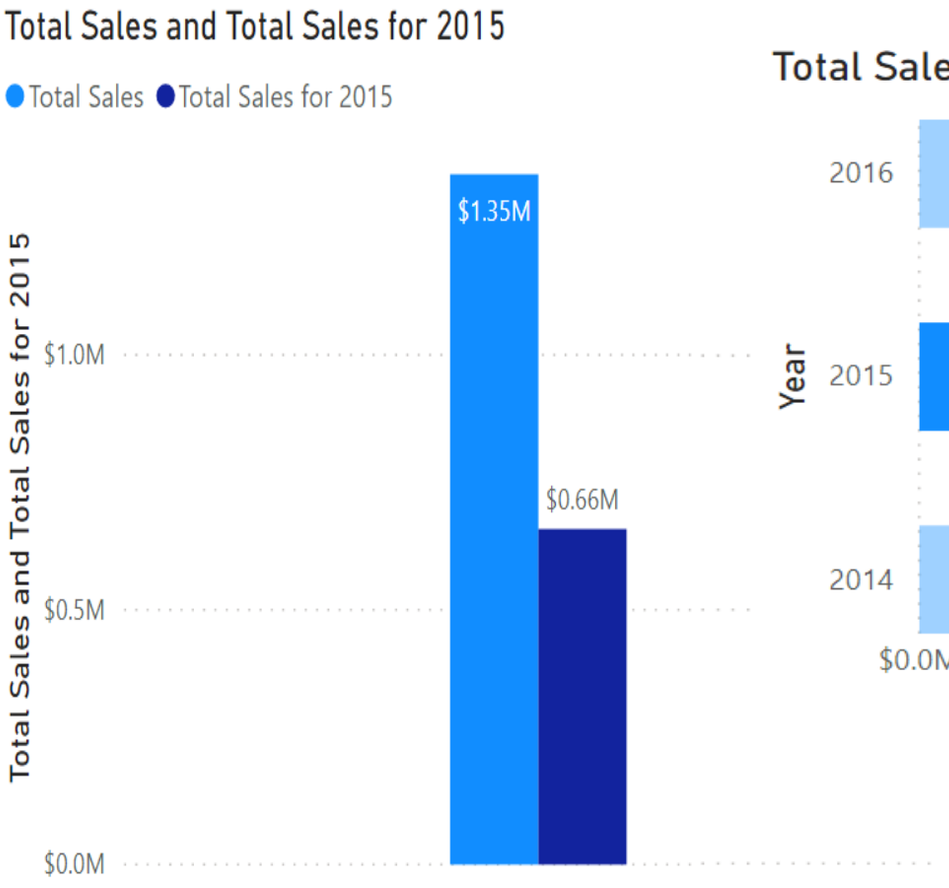
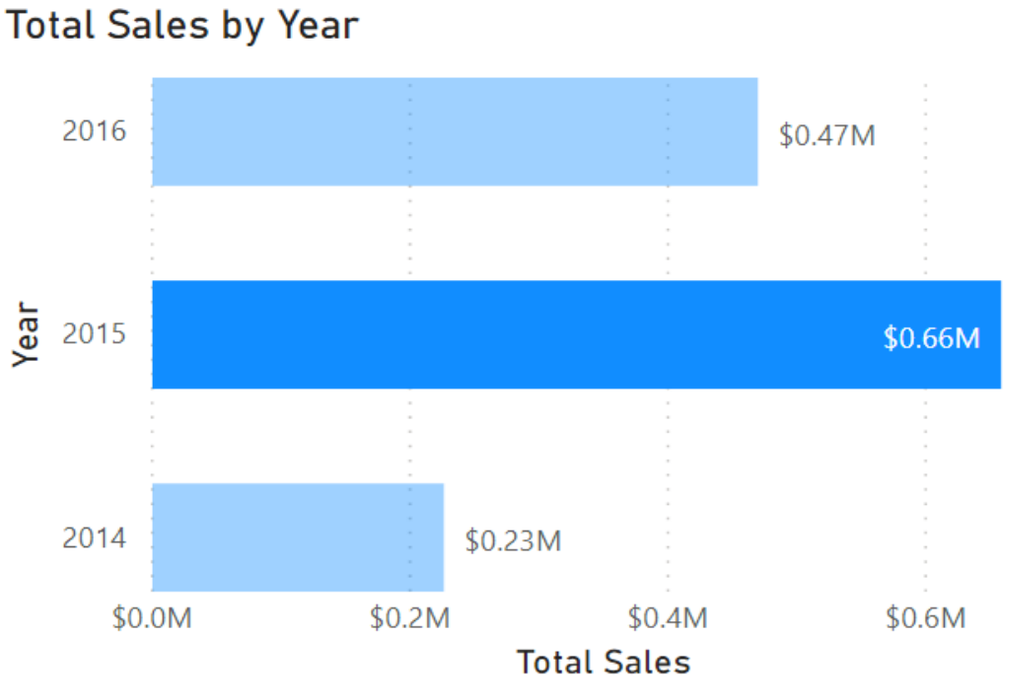
The CALCULATE() Function





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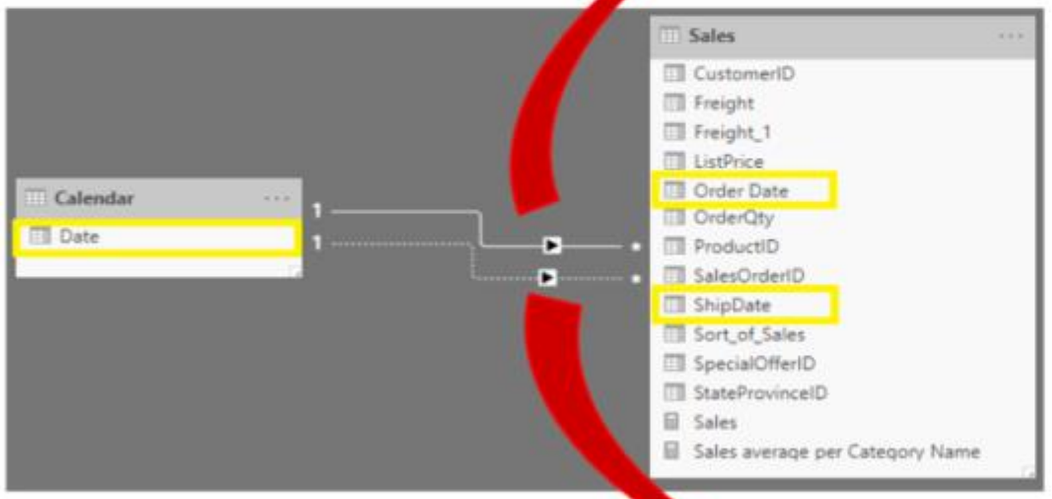
Review Questions

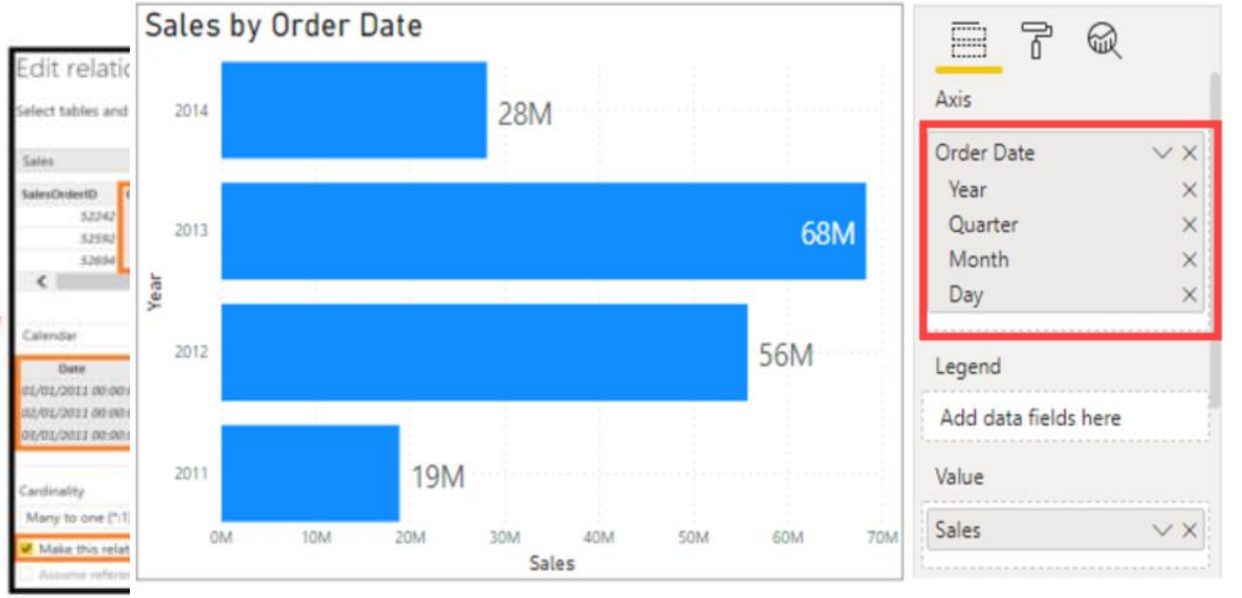
- Q01 – Which DAX function evaluates an expression in a modified filter context?
- A01 – CALCULATE

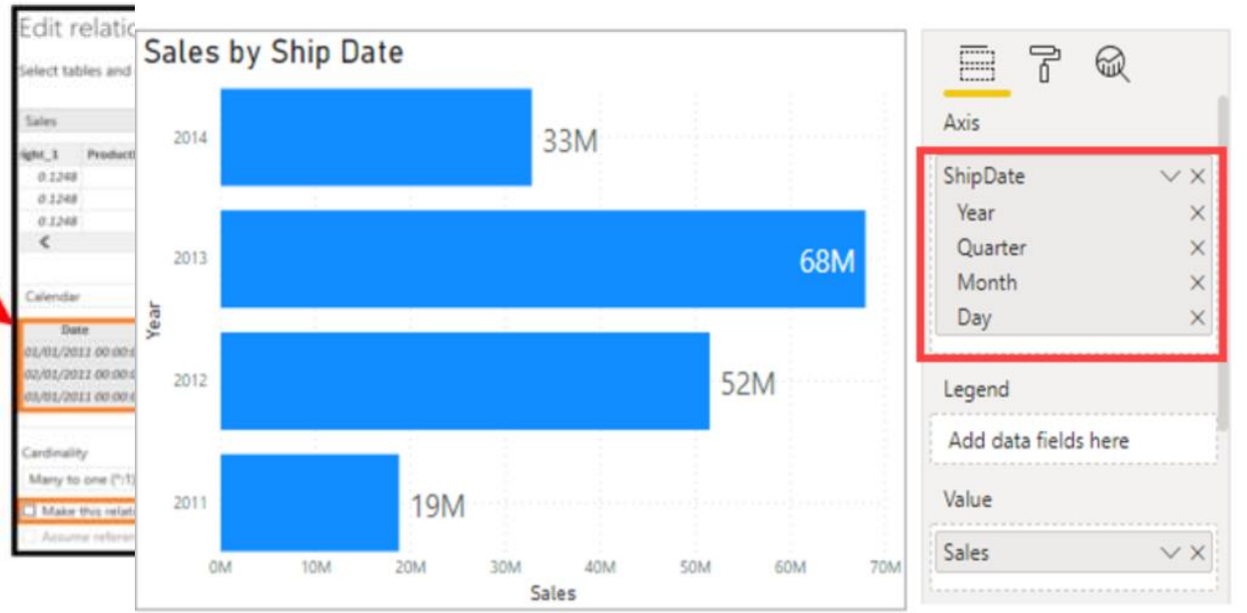
- Q02 – Why would you want to override the default context?
- A02 – To create measures that behave according to your intentions, regardless of what the user selects.

Lesson 3:
Advanced DAX

Using Relationships Effectively







Sales by Ship Date =
CALCULATE(Sales[TotalPrice],
USERELATIONSHIP('Calendar'[Date], Sales[ShipDate]))

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Semi-additive Measures

- Use SUM() to aggregate over one set of dimensions while using different aggregations over other dimensions.
- Commonly used over Time dimensions.
- Ex: calculating inventory each month.

```
Last Inventory Count =
    CALCULATE
(
        SUM ( 'Warehouse'[Inventory Count]
),
        LASTDATE ( 'Date'[Date] )
)
```

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Time-Intelligence

Month	2014	2015	2016
January		$66,692.8	$100,854.72
February		$107,900	$205,416.67
March		$147,879.9	$315,242.12
April		$203,579.29	$449,872.68
May		$260,402.99	$469,771.34
June		$299,490.99	$469,771.34
July	$30,192.1	$354,955.92	$469,771.34
August	$56,801.5	$404,937.61	$469,771.34
September	$84,437.5	$464,670.63	$469,771.34
October	$125,641.1	$534,999.13	$469,771.34
November	$175,345.1	$580,912.49	$469,771.34
December	$226,298.5	$658,388.75	$469,771.34
Total	**$226,298.5**	**$658,388.75**	**$469,771.34**

Year	Month	Total Sales	Total Sales Previous Month
2015	March	$39,979.9	$41,207.2
2015	April	$55,699.39	$39,979.9
2015	May	$56,823.7	$55,699.39
2015	June	$39,088	$56,823.7
2015	July	$55,464.93	$39,088
2015	August	$49,981.69	$55,464.93
2015	September	$59,733.02	$49,981.69
2015	October	$70,328.5	$59,733.02
2015	November	$45,913.36	$70,328.5
2015	December	$77,476.26	$45,913.36

```
Total Sales Previous Month = CALCULATE
(
    SUM('SalesOrderDetails'[Total price]'
    , PREVIOUSMONTH(Dates[Date])
)
```

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Review Questions

- Q01 – What type of Measure uses SUM to aggregate over one set of dimensions and a different aggregation over a different set of dimension?
- A01 – Semi-additive

- Q02 – What type of functions enable you to manipulate data using time periods?
- A02 – Time intelligence

- Q03 – Which two functions will help you compare dates to the previous month?
- A03 – CALCULATE and PREVIOUSMONTH

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Module Overview

We covered the following concepts:

- DAX
  - Measures
  - Calculated columns
  - Context
  - Time-Intelligence

Microsoft Power Platform

References

- DA-100 Introduction to creating measures using DAX in Power BI

https://docs.microsoft.com/en-us/learn/modules/create-measures-dax-power-bi/