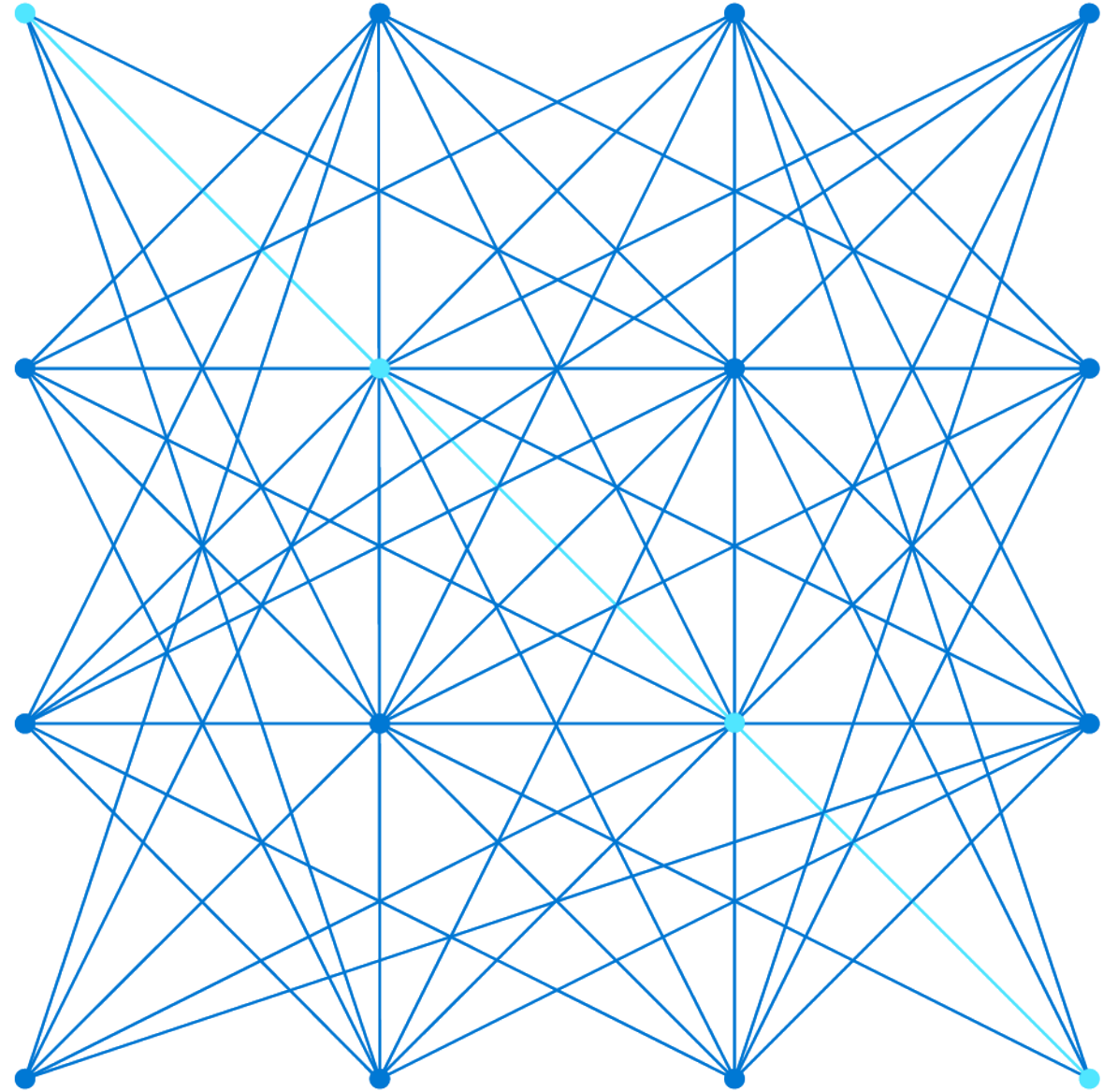


Online Role-based training resources:

Microsoft Learn

<https://docs.microsoft.com/en-us/learn/>

PL-300 Analyzing Data with Power BI



Module 6: Optimize Model Performance

Learning Objectives

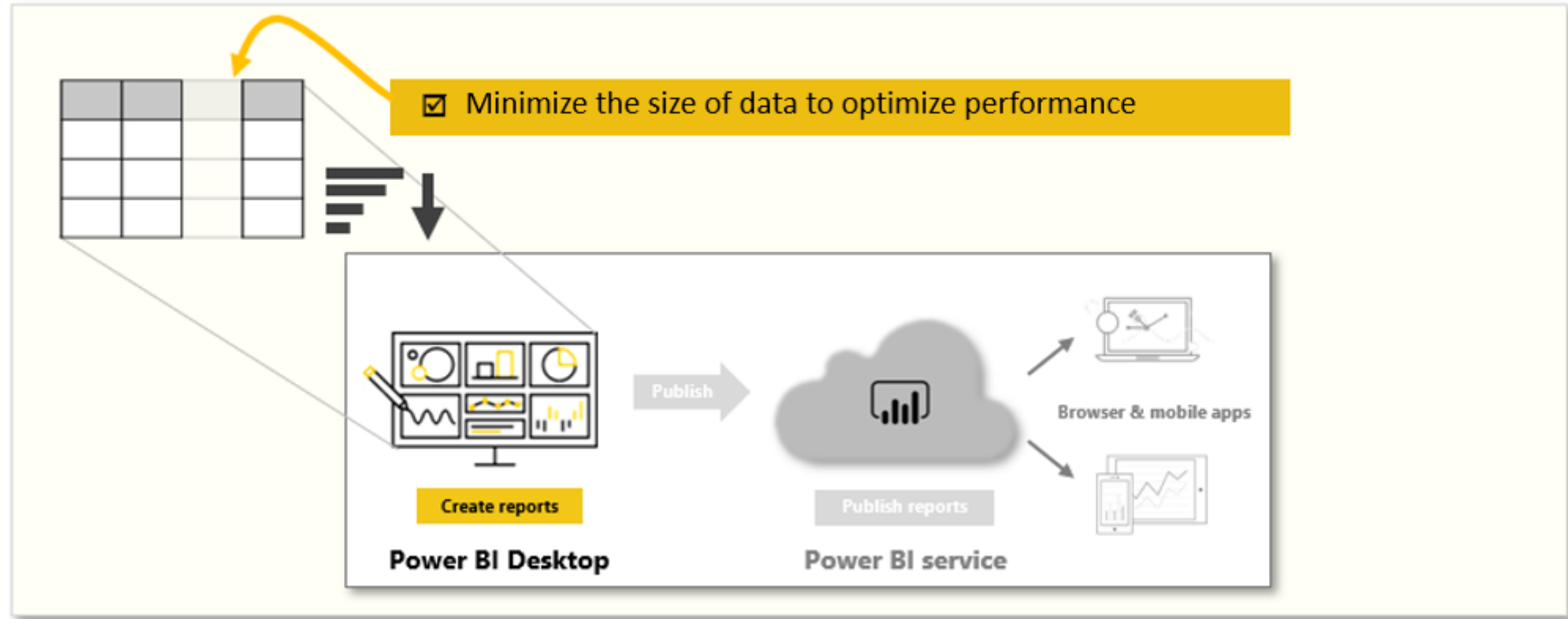
You will learn the following concepts:

- Data model performance optimization
- DirectQuery model optimization
- Aggregations

Lesson 1: Optimize the Data Model for Performance



Introduction to Performance Optimization



When your data model is optimized, it performs better.

Use Variables to Improve Performance and Troubleshooting

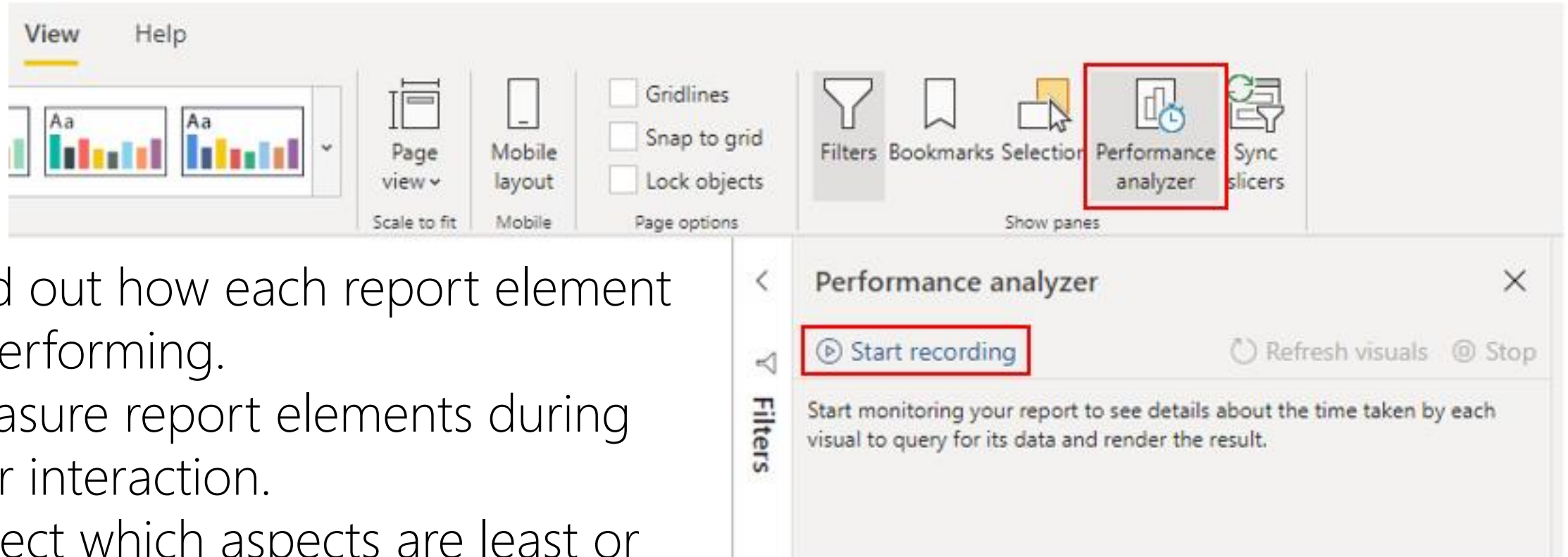
Without variable:

```
Sales YoY Growth =  
DIVIDE (  
    ( [Sales] - CALCULATE ( [Sales], PARALLELPERIOD ( 'Date'[Date], -12, MONTH ) ) ),  
    CALCULATE ( [Sales], PARALLELPERIOD ( 'Date'[Date], -12, MONTH ) )  
)
```

With variable:

```
Sales YoY Growth =  
VAR SalesPriorYear =  
    CALCULATE ( [Sales], PARALLELPERIOD ( 'Date'[Date], -12, MONTH ) )  
VAR SalesVariance =  
    DIVIDE ( ( [Sales] - SalesPriorYear ), SalesPriorYear )  
RETURN  
    SalesVariance
```

Performance Analyzer



- Find out how each report element is performing.
- Measure report elements during user interaction.
- Detect which aspects are least or most resource intensive.

Review Performance Results

- Log information shows duration to complete each task.
- Duration value indicates the difference between the start and end timestamp for each operation.

Performance analyzer

[Start recording](#)
[Refresh visuals](#)
[Stop](#)

[Clear](#)
[Export](#)

Name	Duration (ms) ↑
Recording started (8/06/2020 10:59:48 a.m.)	-
Changed page	-
Card	1913
DAX query	94
Visual display	21
Other	1797
Copy query	
Slicer	1855
Sales by Quarter and Region	1770
Sales by Region and Color	1669
Card	1499
Card	1431
Slicer	1356
Sales by Region	1329
Sales by Quarter	1270

Analyze Query Plans

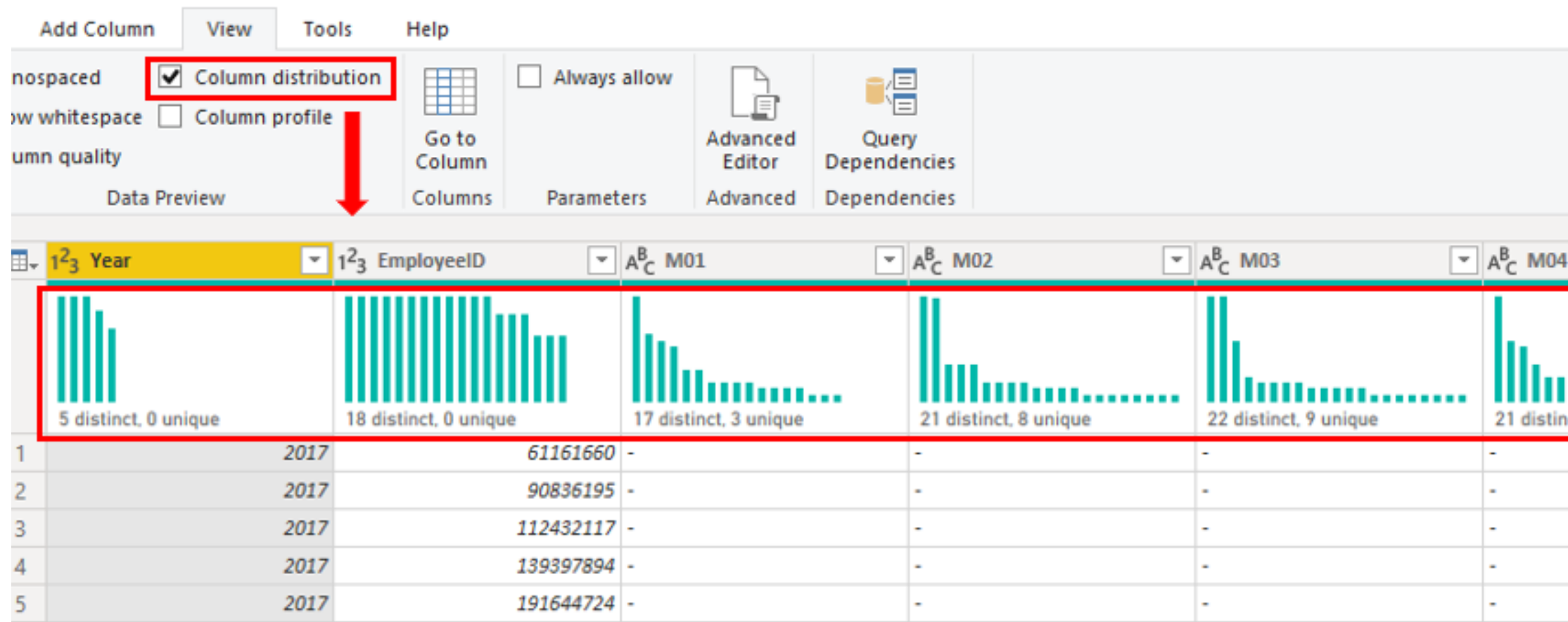
[-] Sales by Year	270
DAX query	2754
Visual display	57
Other	160
Copy query	

Count Customers =
CALCULATE (DISTINCTCOUNT (Order[ProductID]),
FILTER (Order, Order[OrderQty] >= 5))

Count Customers =
CALCULATE (DISTINCTCOUNT (Order[ProductID]),
KEEPFILTERS (Order[OrderQty] >= 5))

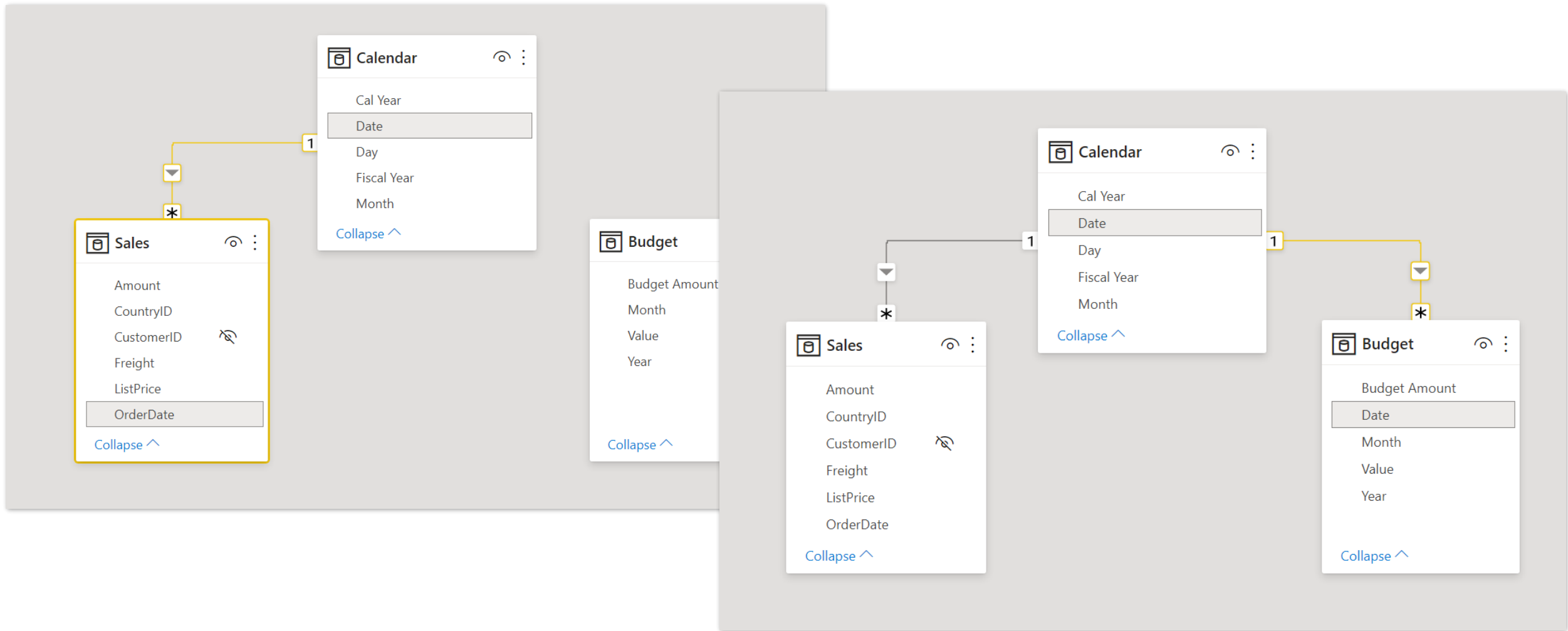
[-] Sales by Year	270
DAX query	54
Visual display	57
Other	160
Copy query	

Reduce Cardinality



Implement Table Granularity

Granularity: The lowest level that data can be in a set of data.

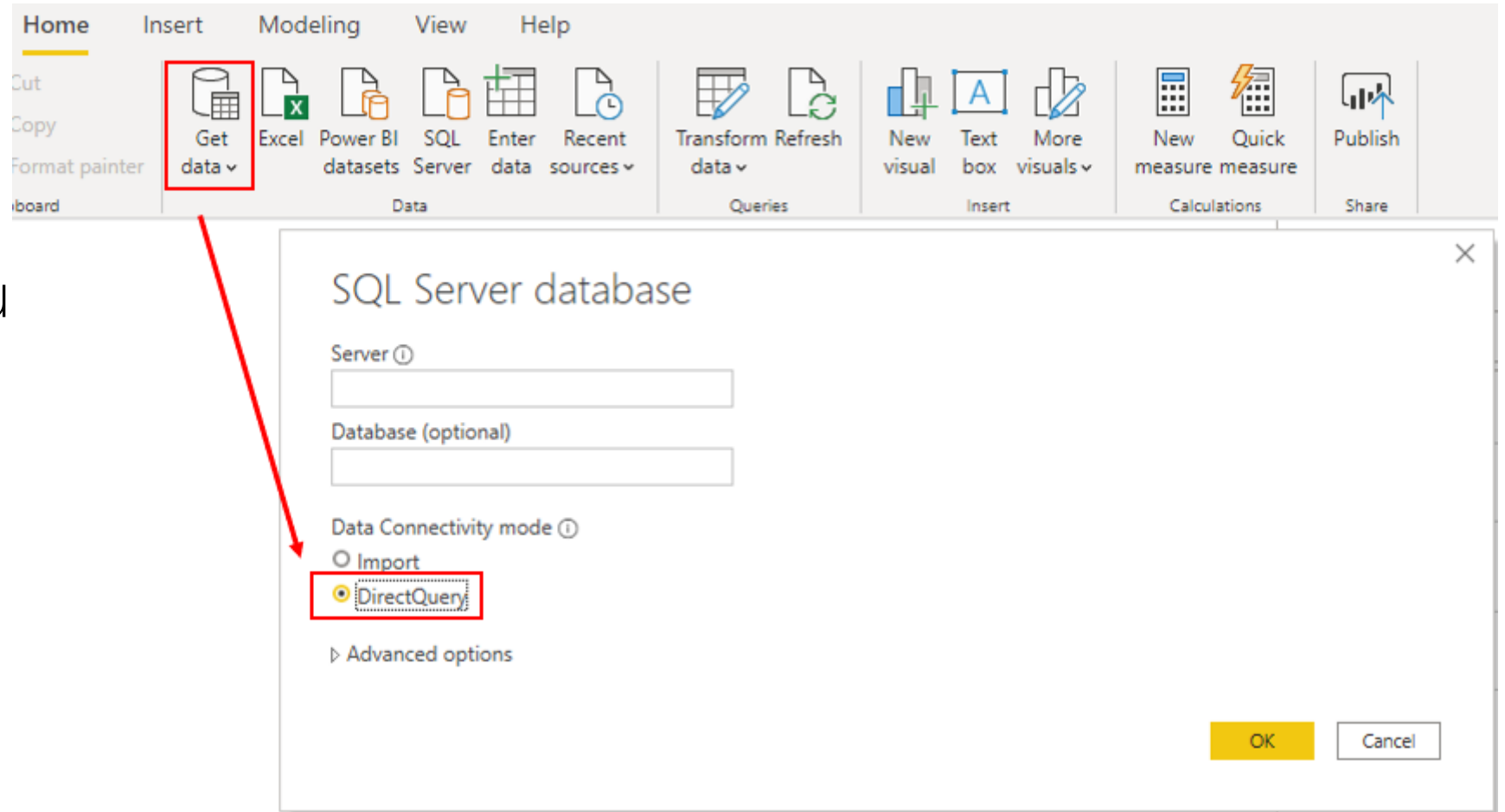


Lesson 2: Optimize DirectQuery Models



Introduction to DirectQuery

Connect directly to your data source repository.

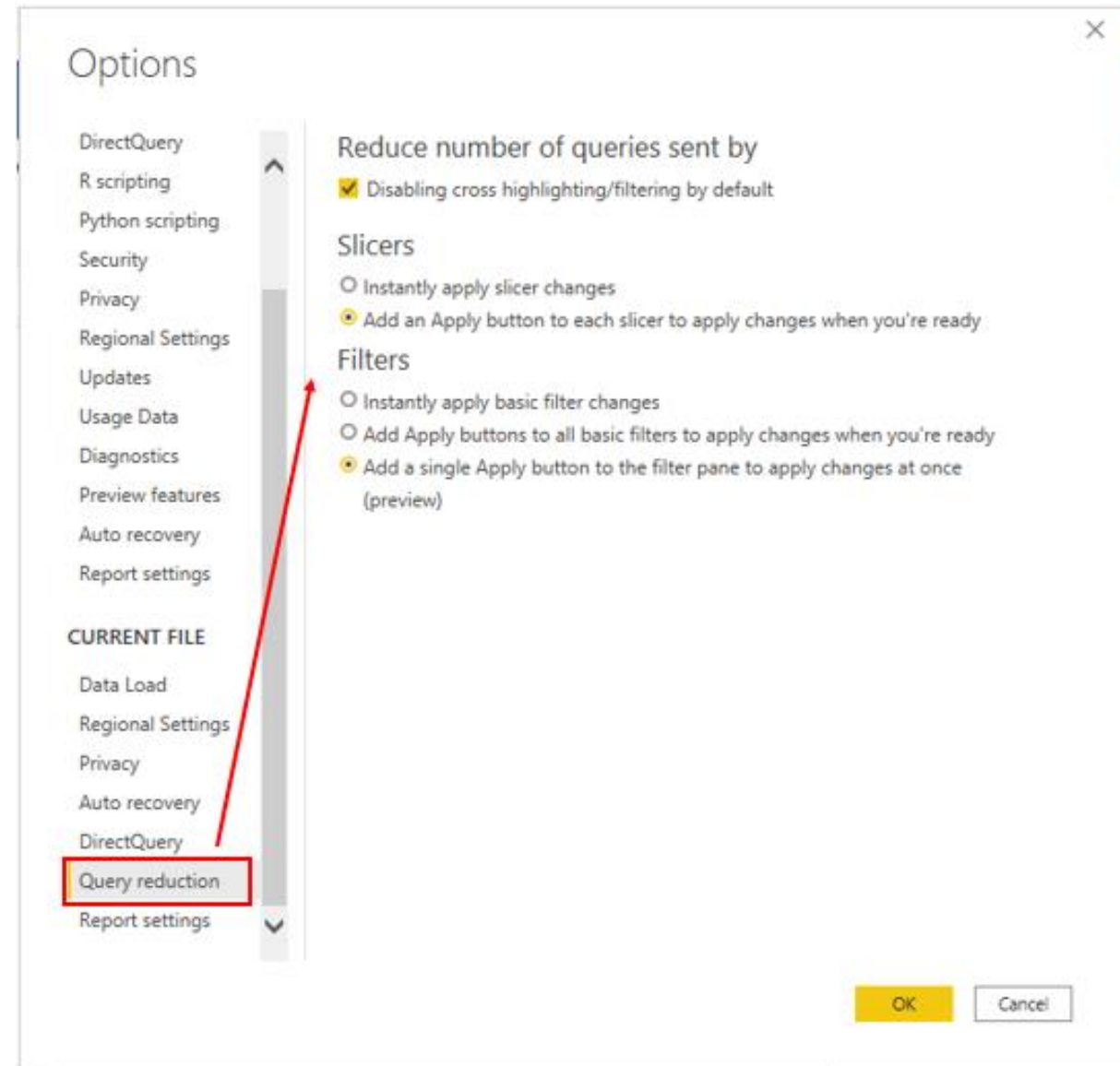


Implications of using DirectQuery

- Benefits:
 - Where data changes frequently.
 - Near-real time reporting is needed.
 - Supports large data volumes.
 - Supports multi-dimensional data.
- Limitations:
 - Performance: Depends on the underlying data source.
 - Security: Understand how data moves between source and destination.
 - Modeling: Some modeling capabilities are limited or aren't supported.
 - Transformation: Some data transformation techniques are limited.

Optimize Performance

- Steps to optimize:
 - Performance Analyzer
 - Data Source
 - Query Reduction

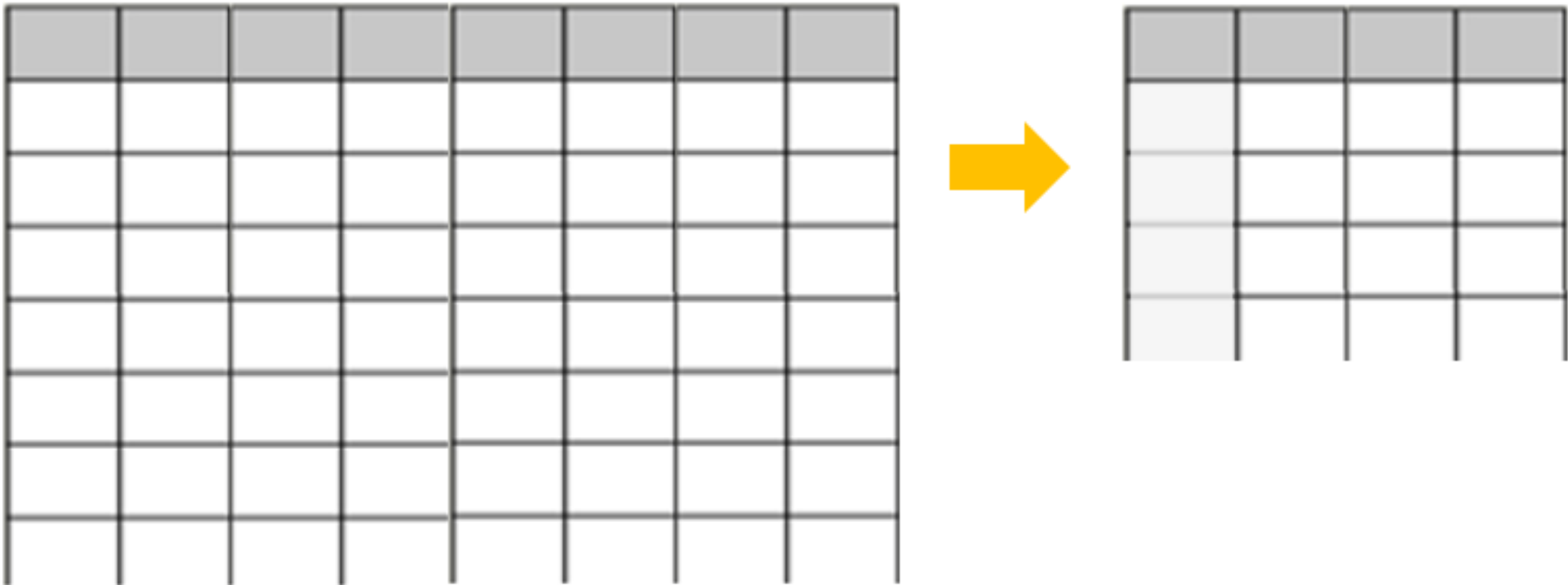


Lesson 3: Create and Manage Aggregations



Introduction to Aggregations

Reduce table size and improve query performance.



Creating Aggregations

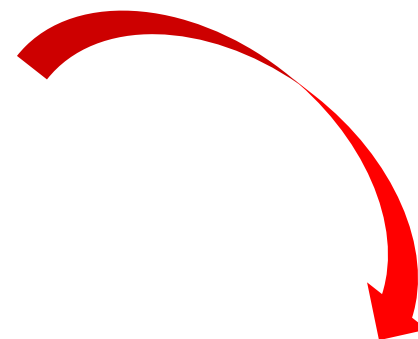
Queries [1]

ResellerSales_202006

	A SalesOrderNumber	1 SalesOrderLineNumber	OrderDate	DueDate	ShipDate
1	S071691	2	1/06/2020	11/06/2020	
2	S071691	4	1/06/2020	11/06/2020	
3	S071774	1	1/06/2020	11/06/2020	
4	S071774	2	1/06/2020	11/06/2020	
5	S071775	1	1/06/2020	11/06/2020	
6	S071775	2	1/06/2020	11/06/2020	
7	S071775	3	1/06/2020	11/06/2020	
8	S071776	1	2/06/2020	12/06/2020	
9	S071777	1	2/06/2020	12/06/2020	
10	S071777	2	2/06/2020	12/06/2020	
11	S071778	1	2/06/2020	12/06/2020	
12	S071778	2	2/06/2020	12/06/2020	
13	S071778	3	2/06/2020	12/06/2020	
14	S071778	4	2/06/2020	12/06/2020	
15	S071779	1	2/06/2020	12/06/2020	
16	S071779	2	2/06/2020	12/06/2020	
17	S071779	3	2/06/2020	12/06/2020	
18	S071779	4	2/06/2020	12/06/2020	
19	S071779	5	2/06/2020	12/06/2020	
20	S071779	6	2/06/2020	12/06/2020	
21	S071779	7	2/06/2020	12/06/2020	
22	S071779	8	2/06/2020	12/06/2020	
23	S071779	9	2/06/2020	12/06/2020	
24	S071779	10	2/06/2020	12/06/2020	
25					

14 COLUMNS, 999+ ROWS Column profiling based on top 1000 rows

- Determine aggregation level.
- Decide appropriate creation method.



22	22/06/2020	55	73935.41	129
23	23/06/2020	116	191212.91	371
24	24/06/2020	20	11193.33	26
25	25/06/2020	62	65857.75	183

4 COLUMNS, 30 ROWS Column profiling based on top 1000 rows

Managing Aggregations

Fields >

Search

^ ResellerSales_20...

- New measure
- New column
- New quick measure
- Refresh data
- Edit query
- Incremental refresh
- Manage aggregations**
- Rename



Manage aggregations

Aggregations accelerate query performance to unlock big-data sets. [Learn more](#)

Aggregation table: ResellerSales_202006
Precedence: 0

AGGREGATION COLUMN	SUMMARIZATION	DETAIL TABLE	DETAIL COLUMN
OnlineOrdersCount	Select Summarizatio...		
OrderDate	Select Summarizatio...		
OrderQuantity_Sum	Select Summarizatio...		
SalesAmount_Sum	Select Summarizatio...		

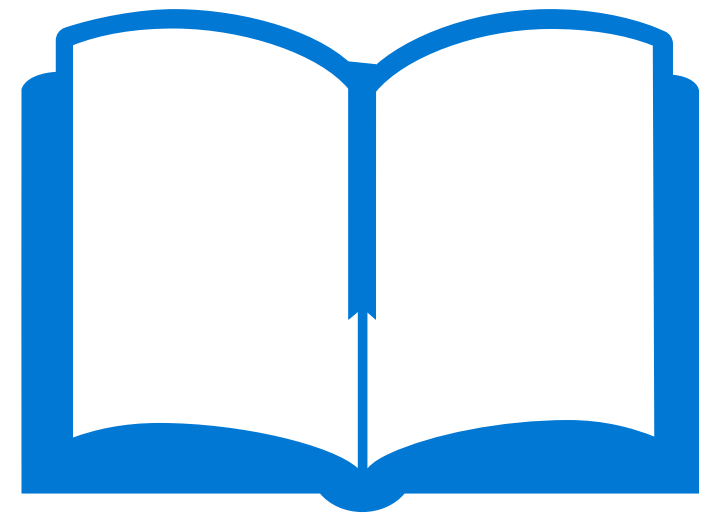
Module Overview

We covered the following concepts:

- Data model performance optimization
- DirectQuery model optimization
- Aggregations

References

- PL-300 Optimize a model for performance in Power BI
<https://docs.microsoft.com/en-us/learn/modules/create-measures-dax-power-bi/>



Azure Technical Trainer Role Based Training