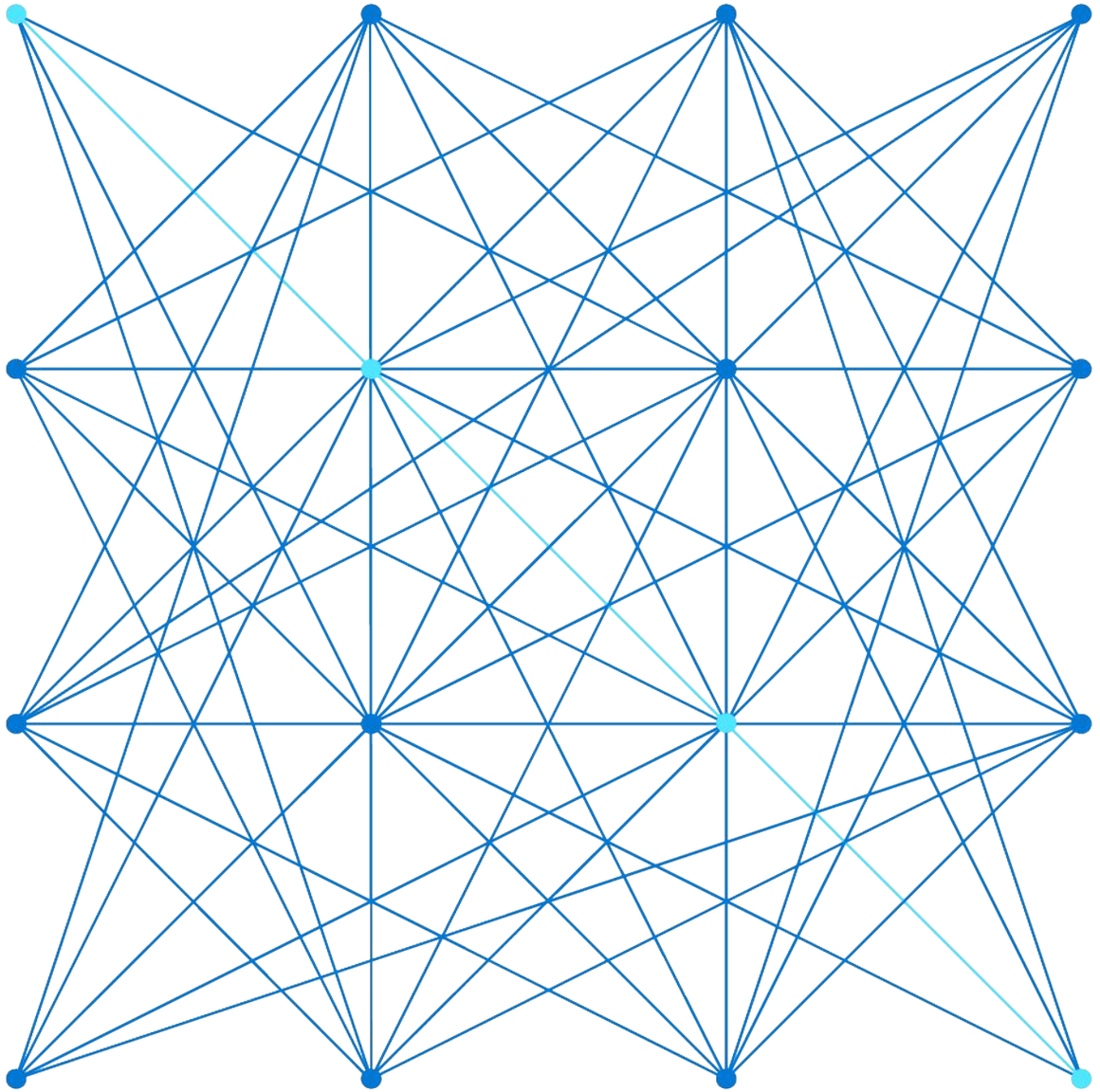
DA-100 Analyzing Data with Power BI

<Name>, <Title>



Module 6: Optimize Model Performance

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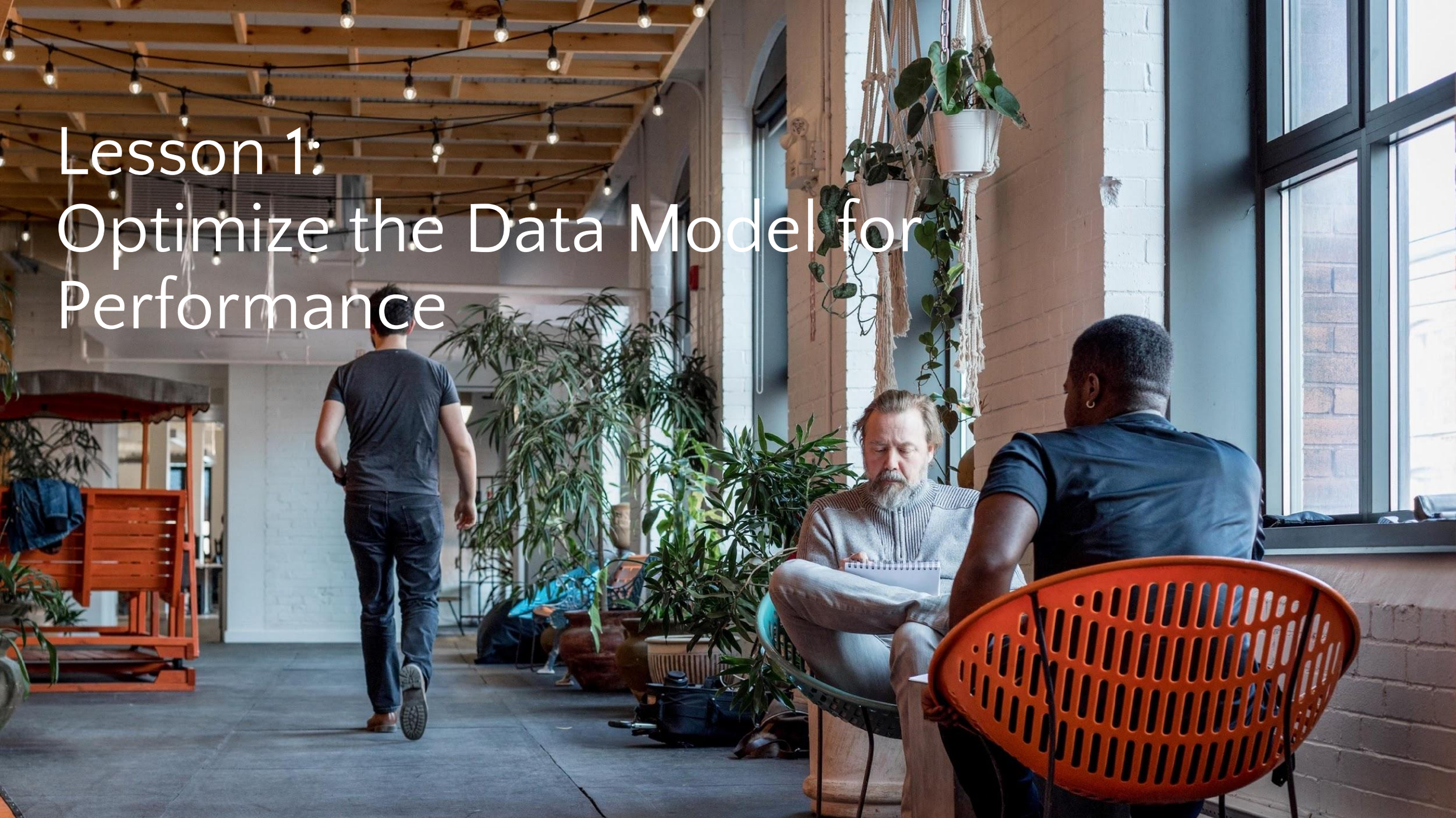
Learning Objectives

You will learn the following concepts:

- Data model performance optimization
- DirectQuery model optimization
- Aggregations



Lesson 1: Optimize the Data Model for Performance

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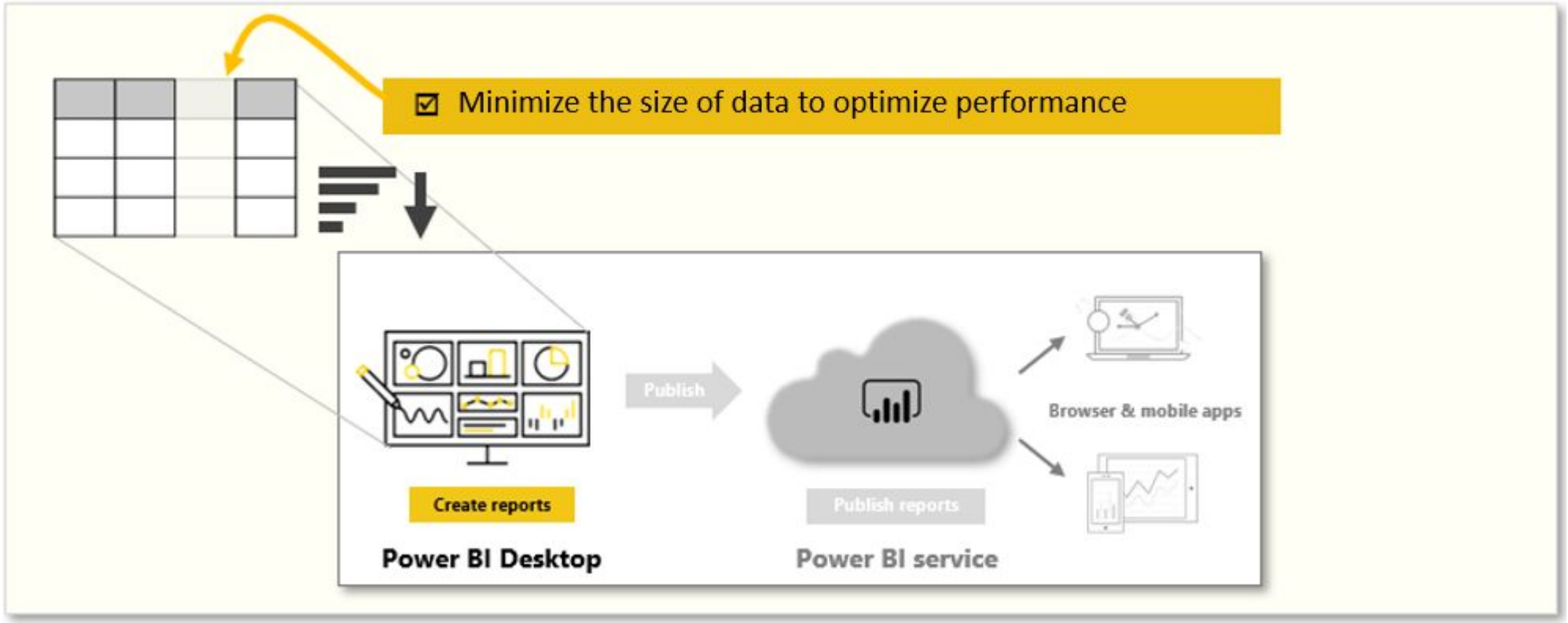
Introduction to Performance Optimization



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
```

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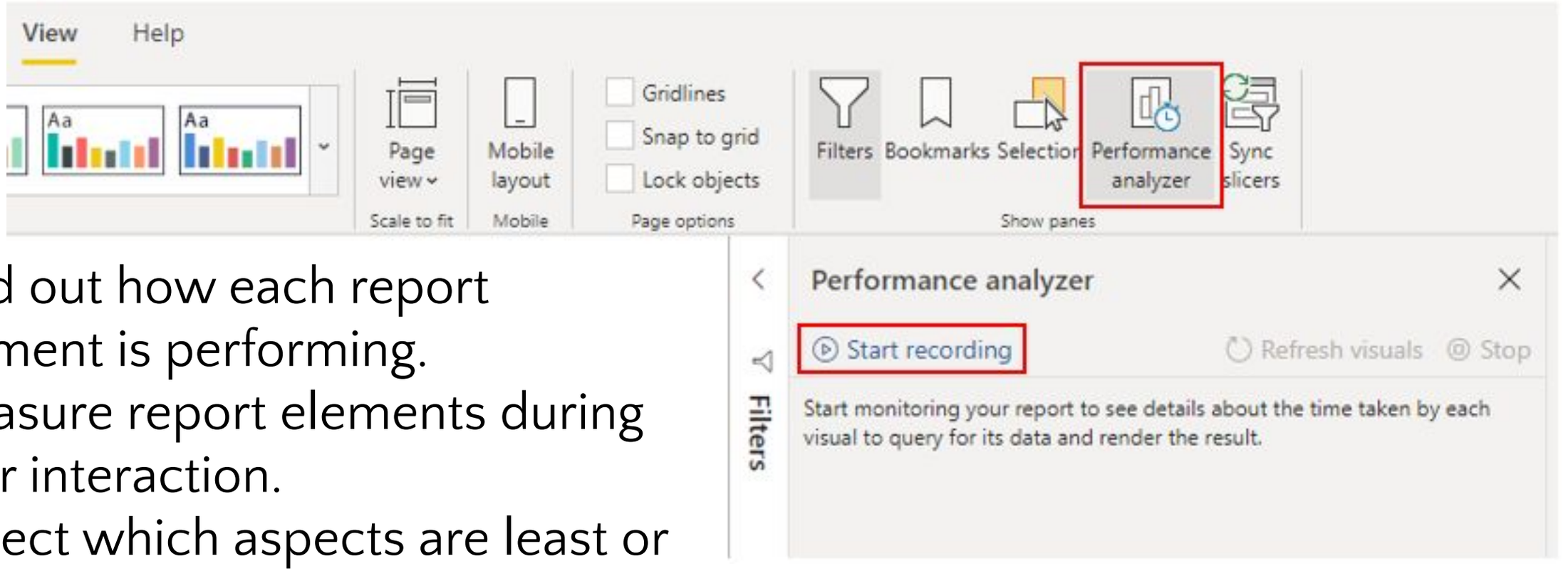
Performance Analyzer



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

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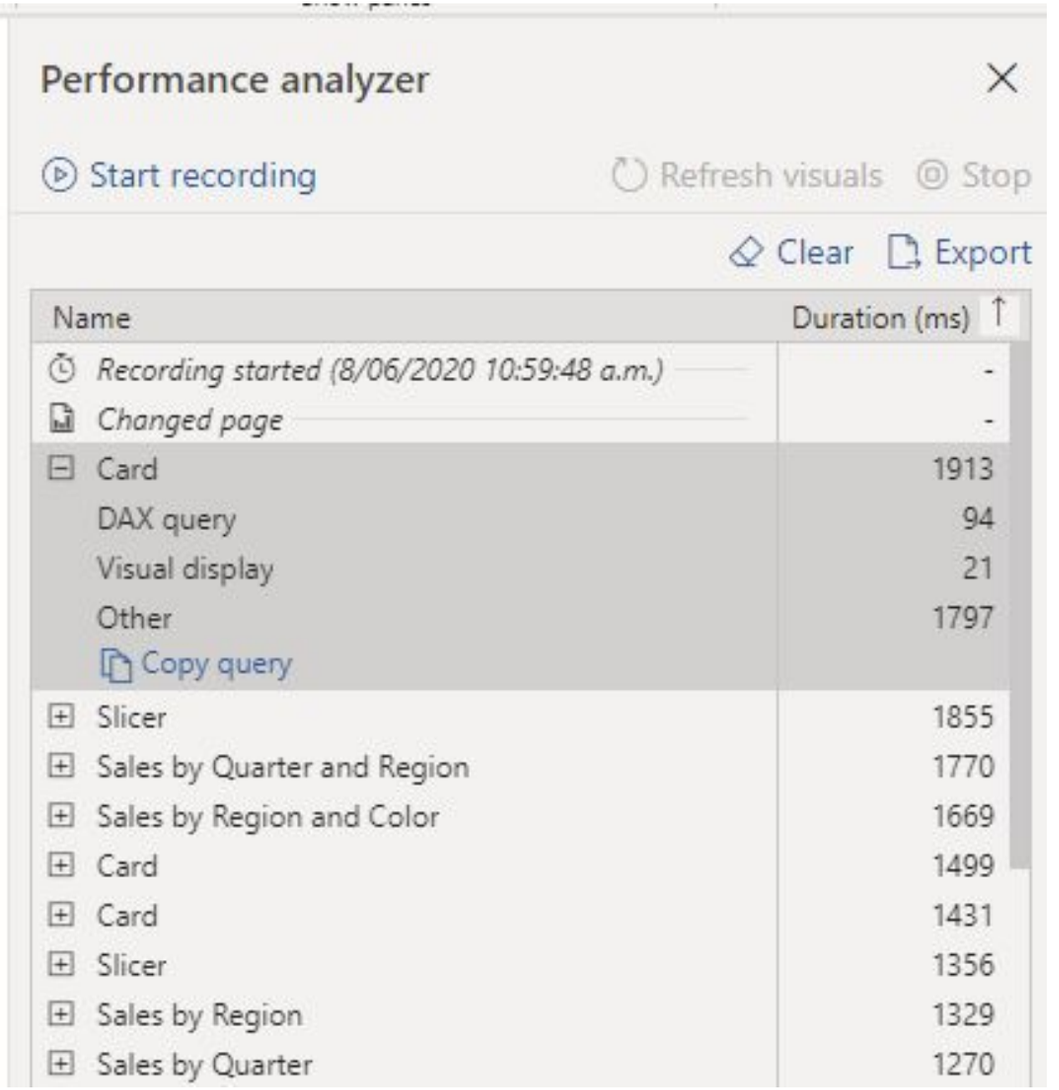
Review Performance Results

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



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Analyze Query Plans


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

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

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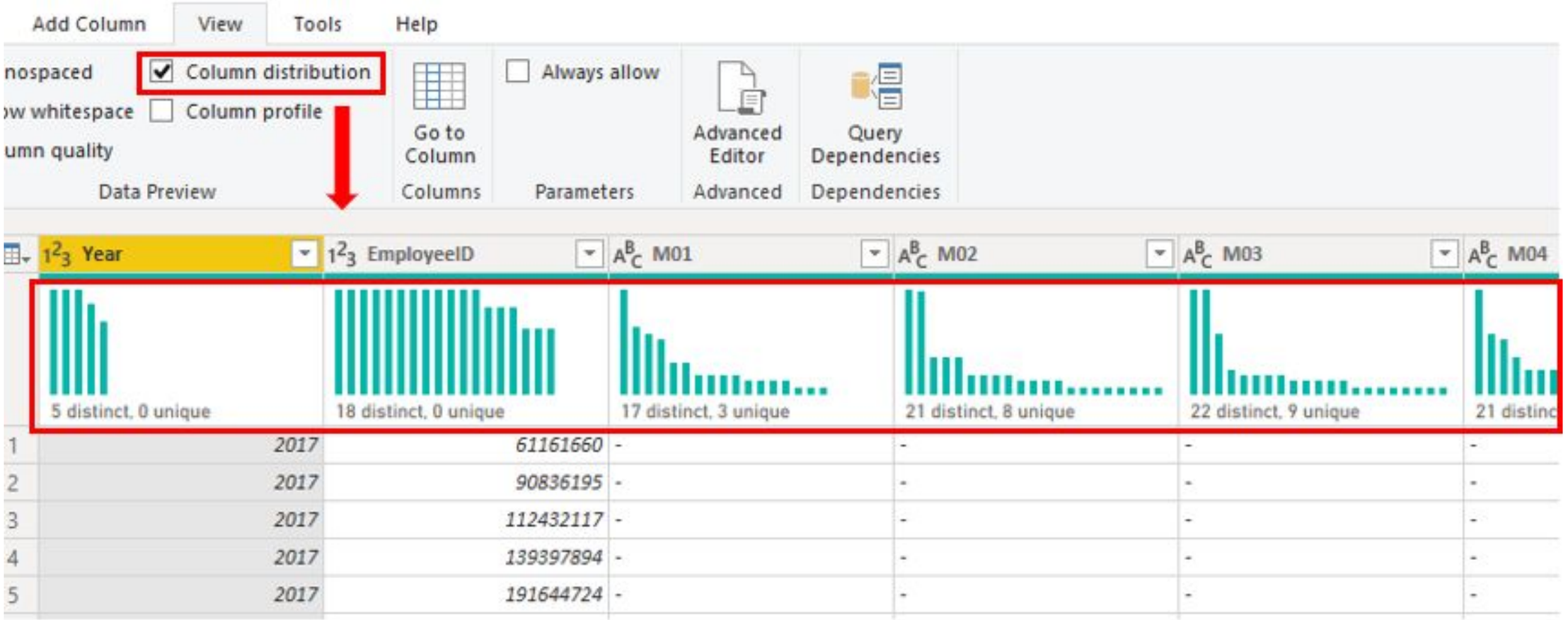
Reduce Cardinality



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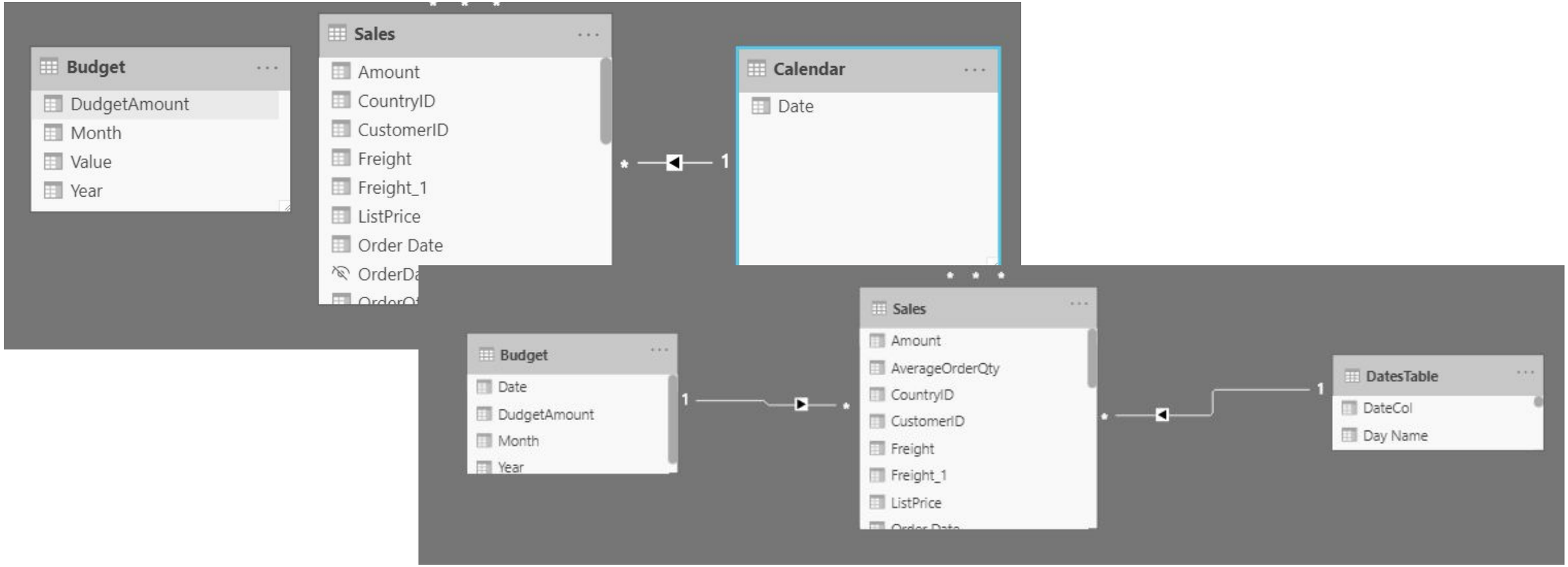
Implement Table Granularity

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



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Review Questions

- Q01 – What benefit do you get from analyzing metadata?
- A01 – The benefit of analyzing metadata is that you can clearly identify data inconsistencies with your dataset.

- Q02 – Which tool enables you to identify bottlenecks that exist in code?
- A02 – Performance Analyzer

- Q03 – What is cardinality?
- A03 – The direction that the data flows in a relationship between tables.

Lesson 2: Optimize DirectQuery Models

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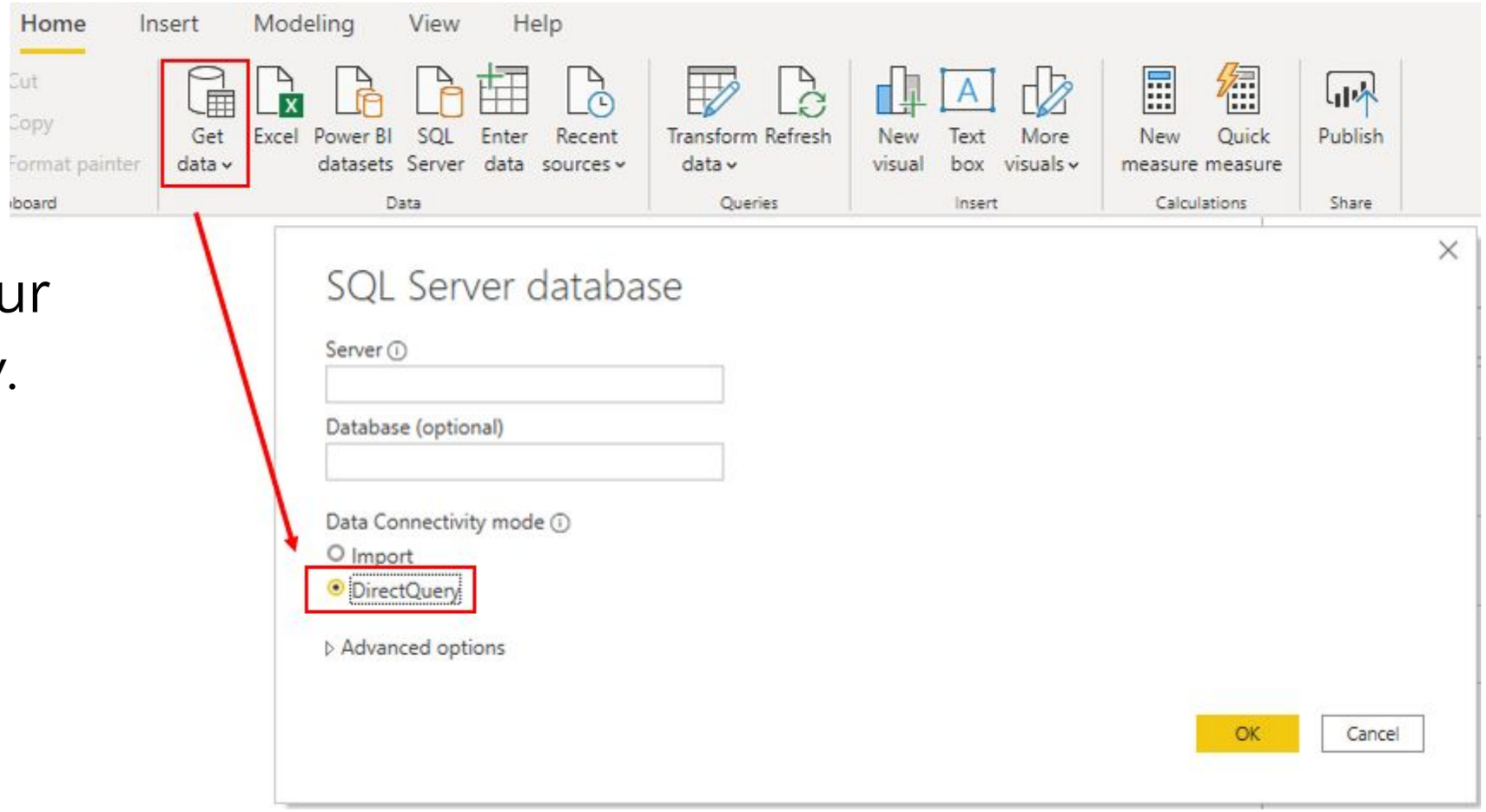
Introduction to DirectQuery

Connect directly to your data source repository.



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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.

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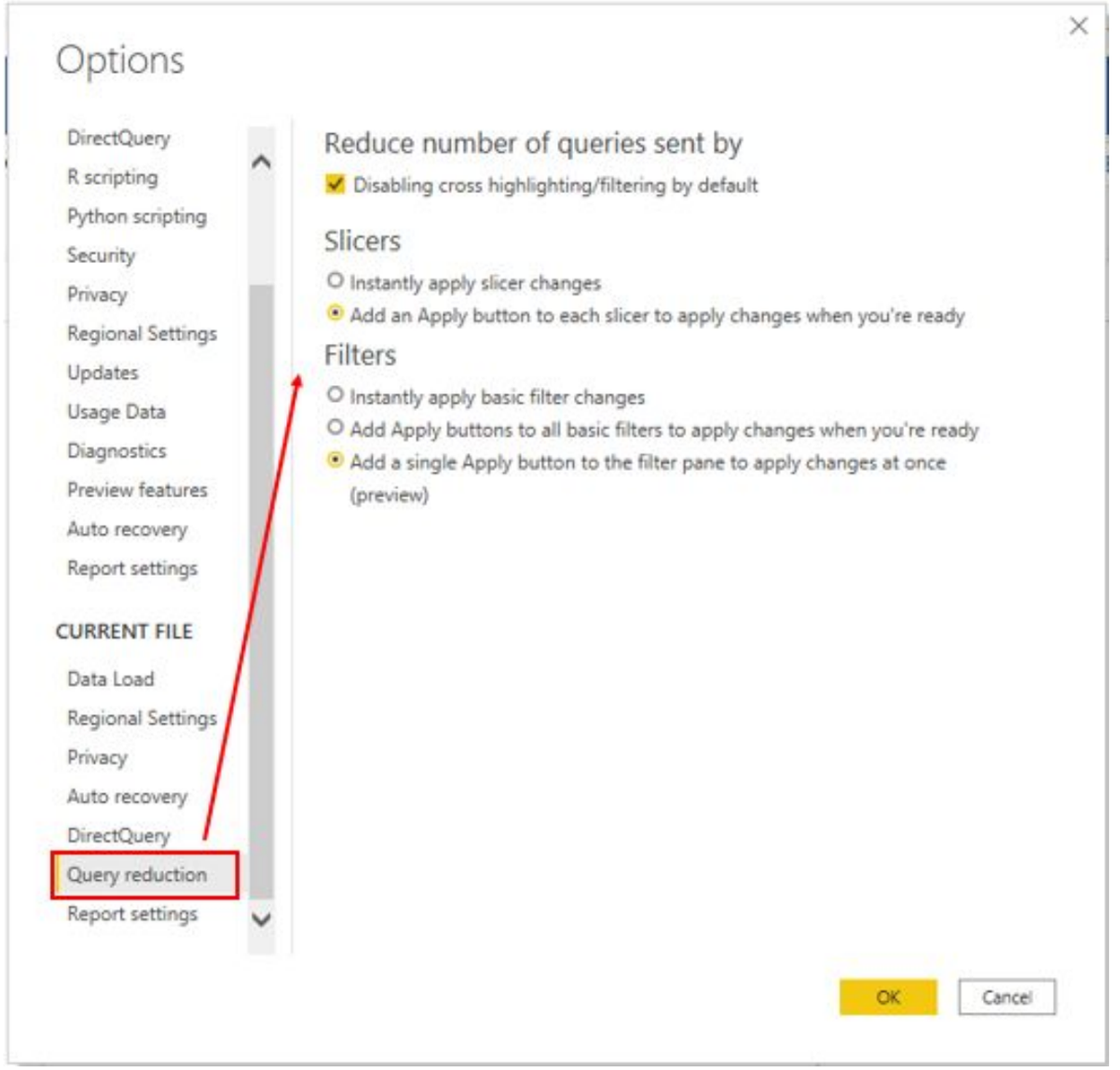
Optimize Performance

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



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Review Questions

- Q01 – Which Power BI option gives you the option to send fewer queries and disable certain interactions?
- A01 – Query reduction.

- Q02 – Other than Power BI, another place for performance optimization can be performed is where?
- A02 – At the data source

- Q03 – Is it possible to create a relationship between two columns if they are different DATA TYPE columns?
- A03 – No, both columns in a relationship must be sharing the same DATA TYPE.

Lesson 3: Create and Manage Aggregations

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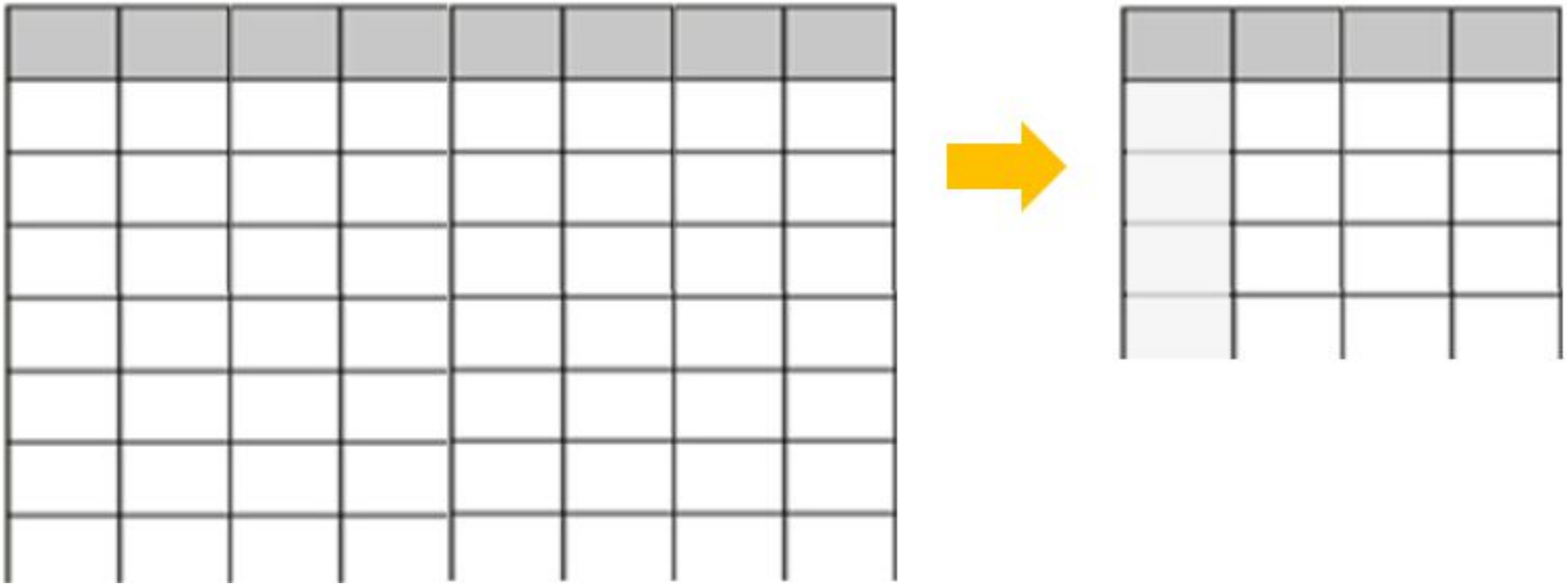
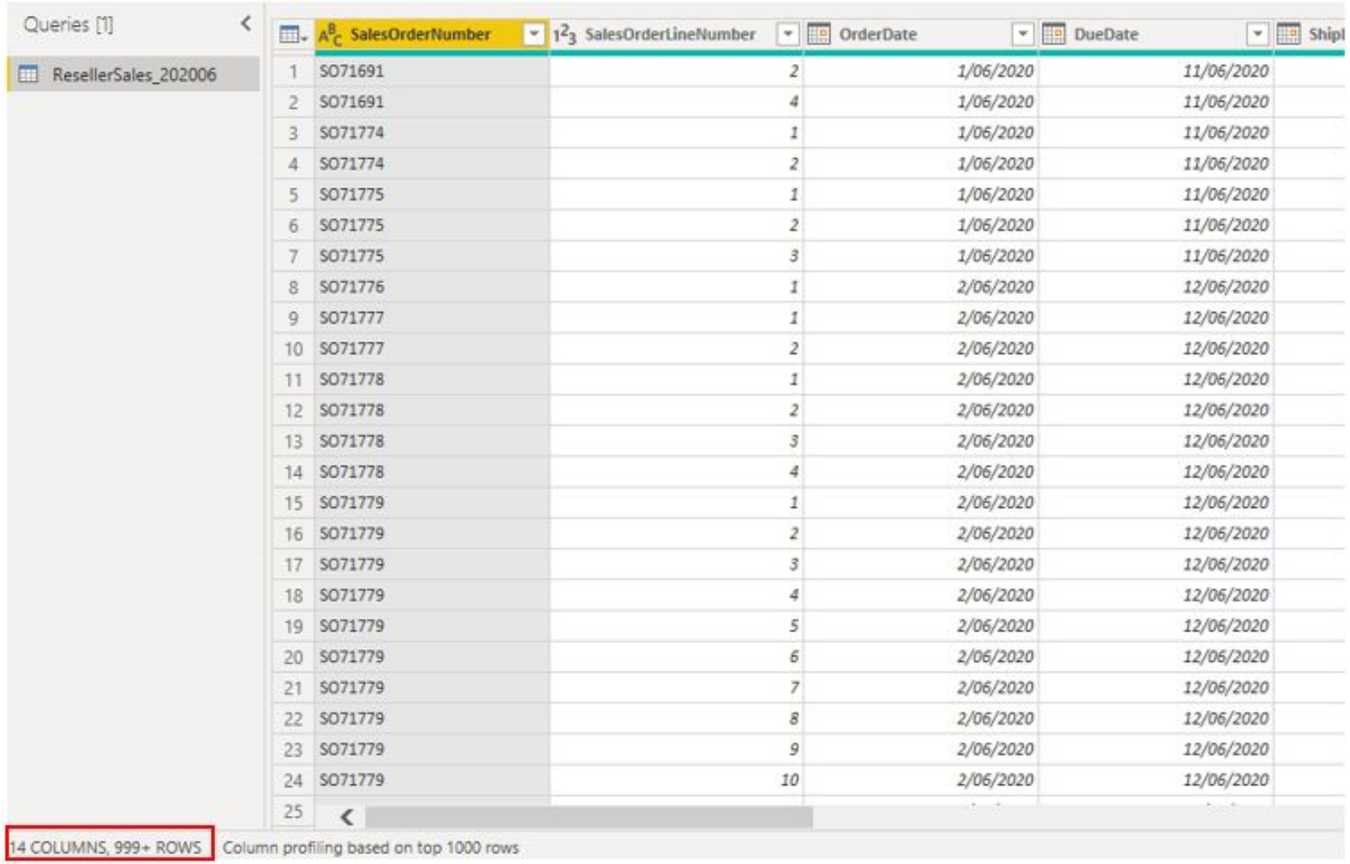
Introduction to Aggregations

Reduce table size and improve query performance.



Creating Aggregations



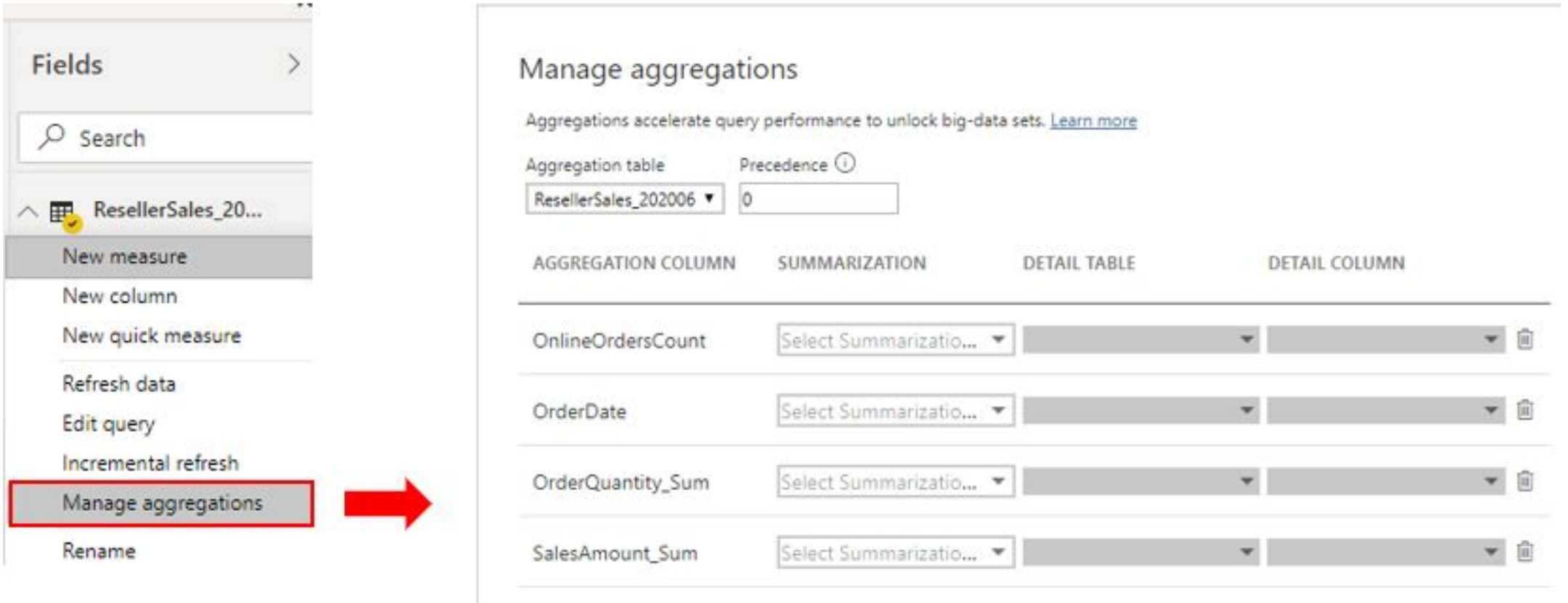
	SalesOrderNumber	SalesOrderLineNumber	OrderDate	DueDate
1	SO71691	2	1/06/2020	11/06/2020
2	SO71691	4	1/06/2020	11/06/2020
3	SO71774	1	1/06/2020	11/06/2020
4	SO71774	2	1/06/2020	11/06/2020
5	SO71775	1	1/06/2020	11/06/2020
6	SO71775	2	1/06/2020	11/06/2020
7	SO71775	3	1/06/2020	11/06/2020
8	SO71776	1	2/06/2020	12/06/2020
9	SO71777	1	2/06/2020	12/06/2020
10	SO71777	2	2/06/2020	12/06/2020
11	SO71778	1	2/06/2020	12/06/2020
12	SO71778	2	2/06/2020	12/06/2020
13	SO71778	3	2/06/2020	12/06/2020
14	SO71778	4	2/06/2020	12/06/2020
15	SO71779	1	2/06/2020	12/06/2020
16	SO71779	2	2/06/2020	12/06/2020
17	SO71779	3	2/06/2020	12/06/2020
18	SO71779	4	2/06/2020	12/06/2020
19	SO71779	5	2/06/2020	12/06/2020
20	SO71779	6	2/06/2020	12/06/2020
21	SO71779	7	2/06/2020	12/06/2020
22	SO71779	8	2/06/2020	12/06/2020
23	SO71779	9	2/06/2020	12/06/2020
24	SO71779	10	2/06/2020	12/06/2020
25				

- 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



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Review Questions

- Q01 – A critical aspect of data aggregation is that it allows you to focus on what?
- A01 – The important and most meaningful data.

- Q02 – Before you start creating aggregations, you should first decide what?
- A02 – The grain (level) on which to create them.

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Module Overview

We covered the following concepts:

- Data model performance optimization
- DirectQuery model optimization
- Aggregations

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References

- DA-100 Optimize a model for performance in Power BI

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