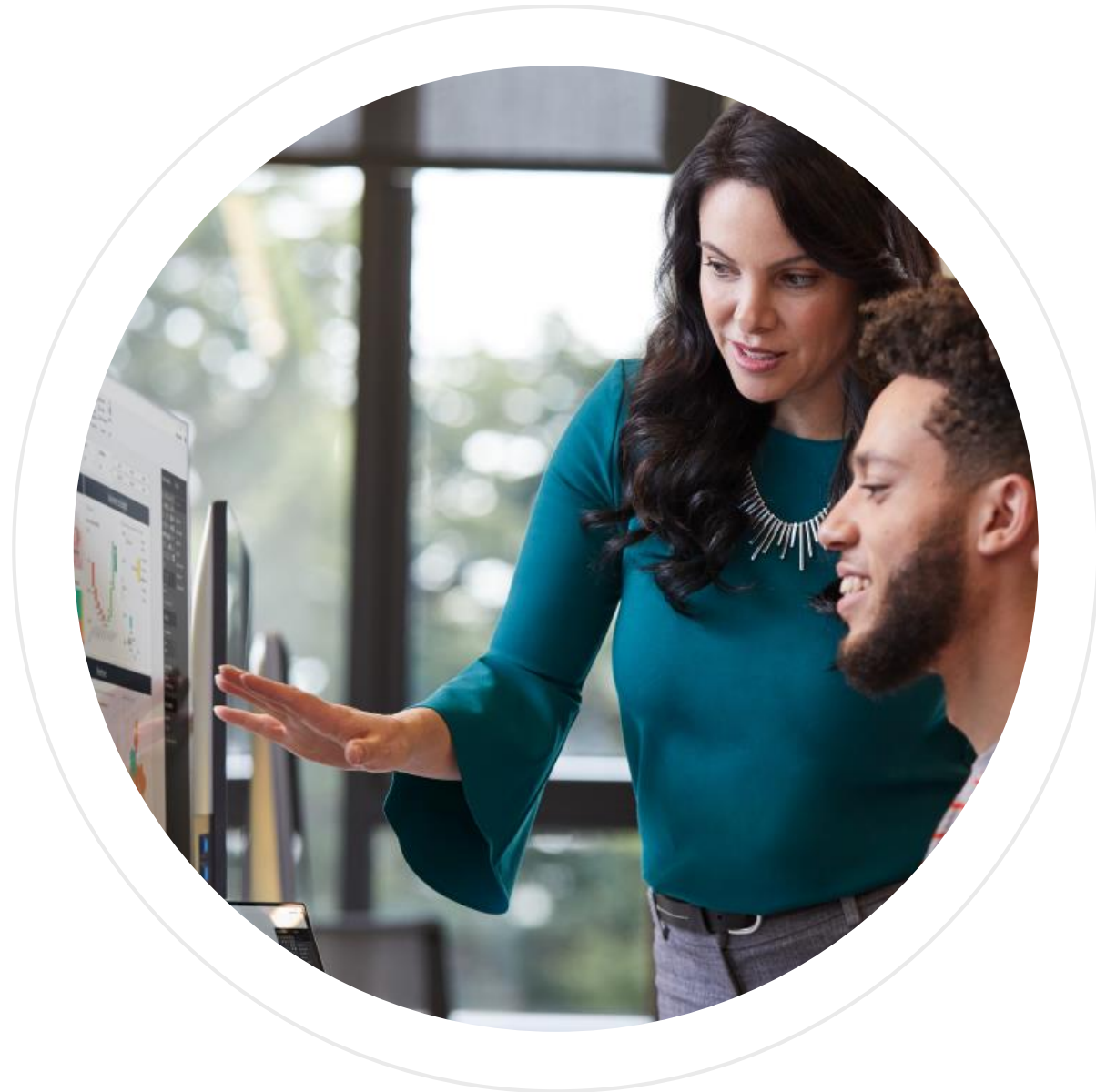


Module 6: Optimize Model Performance

Mohammed Arif



Learning Objectives

You will learn the following concepts:

- Data model performance optimization
- DirectQuery model optimization

Module Agenda



Optimize the Data Model for Performance



Identify poorly performing measures, relationships, and visuals



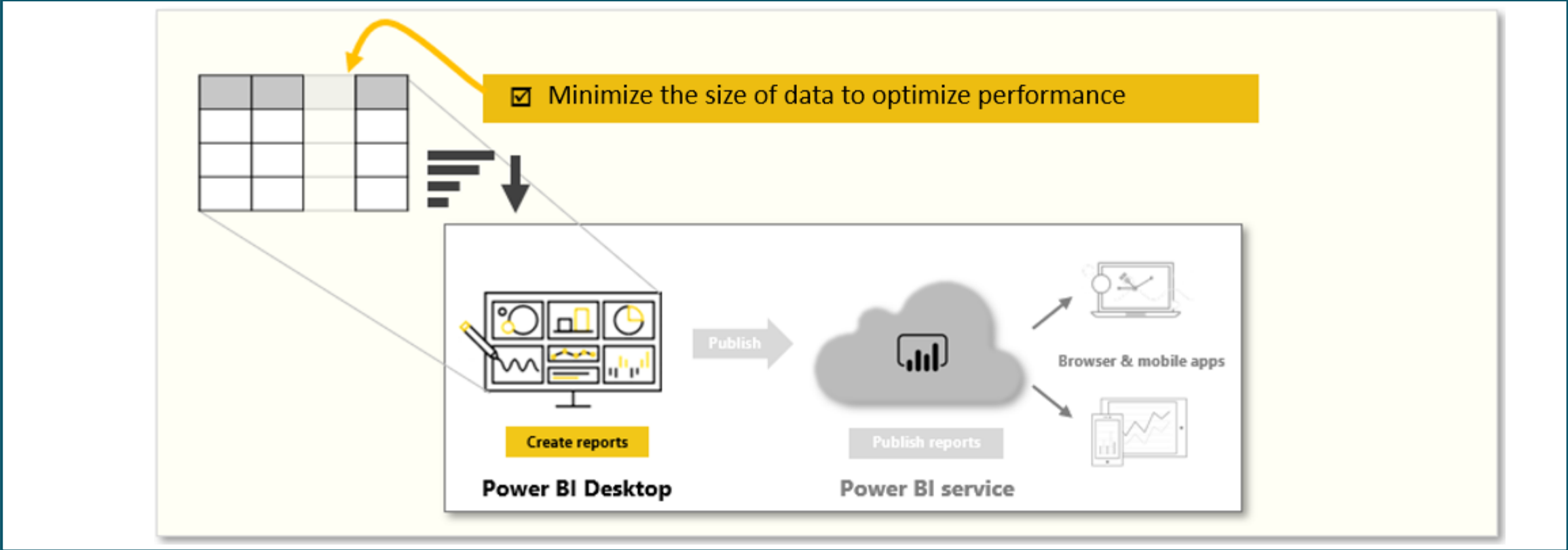
Reduce cardinality levels to improve performance

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 ) )
```

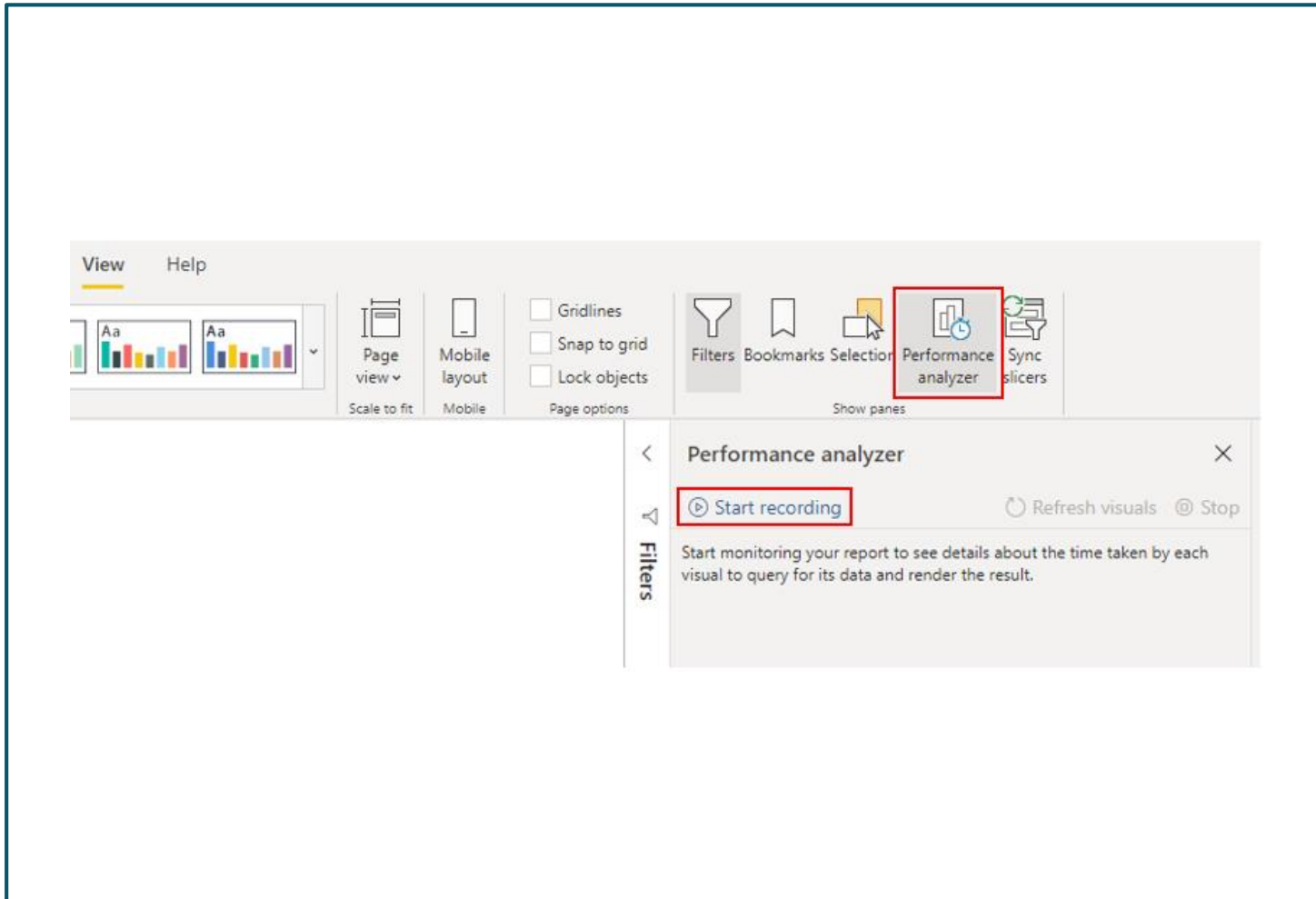
VAR SalesVariance =

```
DIVIDE ( ( [Sales] - SalesPriorYear ), SalesPriorYear )
```

RETURN

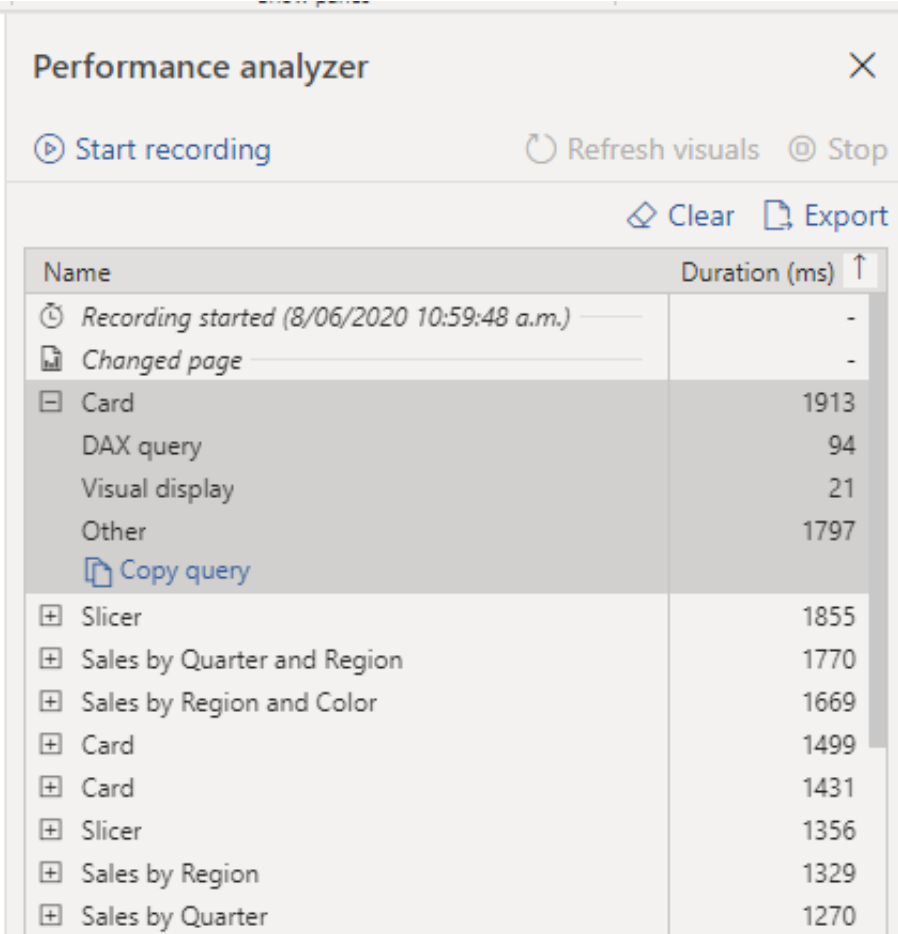
```
SalesVariance
```

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




The screenshot shows the Performance analyzer window with a table of recorded operations. The table has two columns: 'Name' and 'Duration (ms)'. The operations listed include 'Recording started', 'Changed page', a 'Card' (with sub-items: DAX query, Visual display, Other), a 'Slicer', and several 'Sales by' reports. The durations range from 21ms to 1913ms.

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

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

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

nospaced Column distribution Always allow
allow whitespace Column profile
column quality
Data Preview


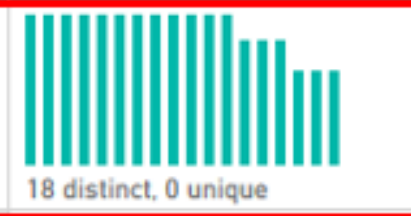
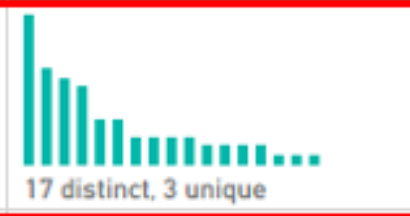
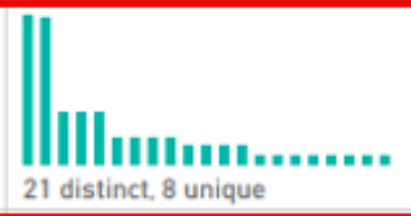


Go to Column
Columns

Parameters

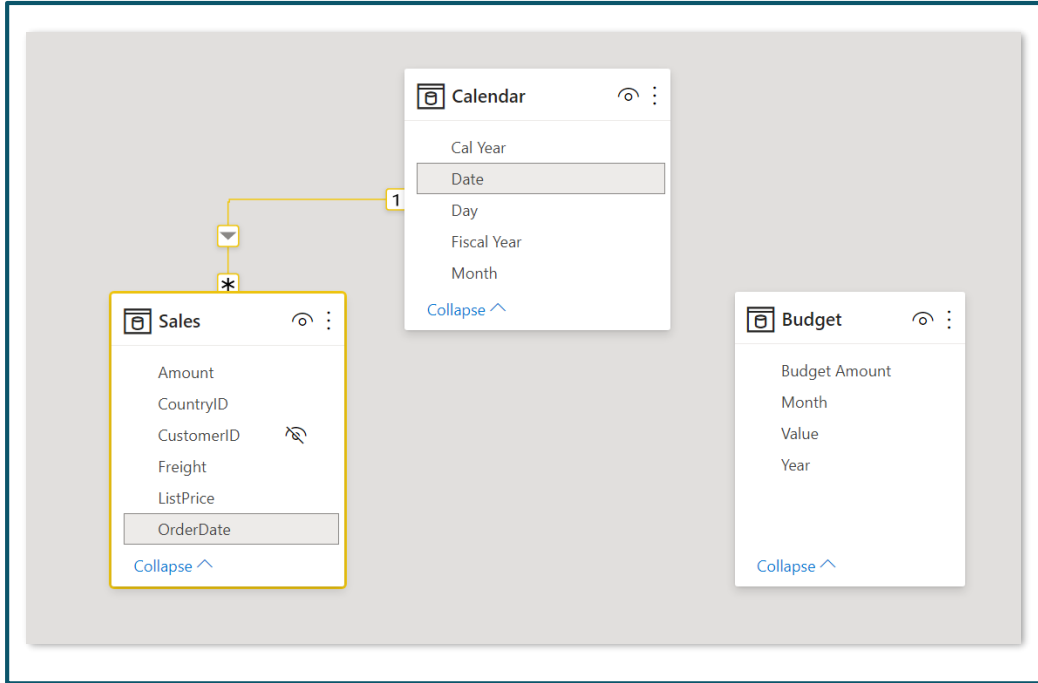
Advanced Editor
Advanced

Query Dependencies
Dependencies

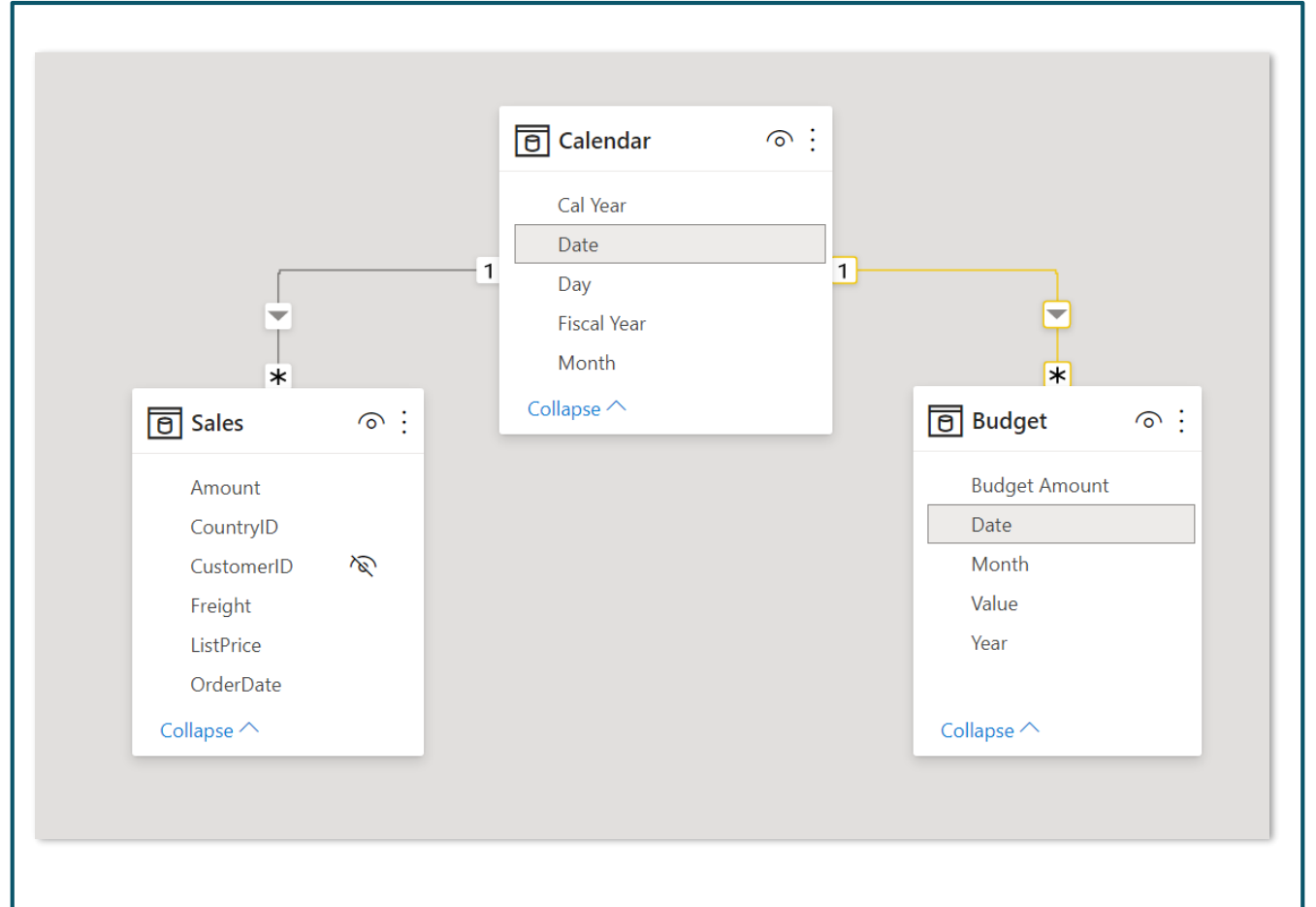
1²3 Year 1²3 EmployeeID A^BC M01 A^BC M02 A^BC M03 A^BC M04

	1 ² 3 Year	1 ² 3 EmployeeID	A ^B C M01	A ^B C M02	A ^B C M03	A ^B C M04
	 5 distinct, 0 unique	 18 distinct, 0 unique	 17 distinct, 3 unique	 21 distinct, 8 unique	 22 distinct, 9 unique	 21 distinct
1	2017	61161660	-	-	-	-
2	2017	90836195	-	-	-	-
3	2017	112432117	-	-	-	-
4	2017	139397894	-	-	-	-
5	2017	191644724	-	-	-	-

Implement Table Granularity



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



Review Questions

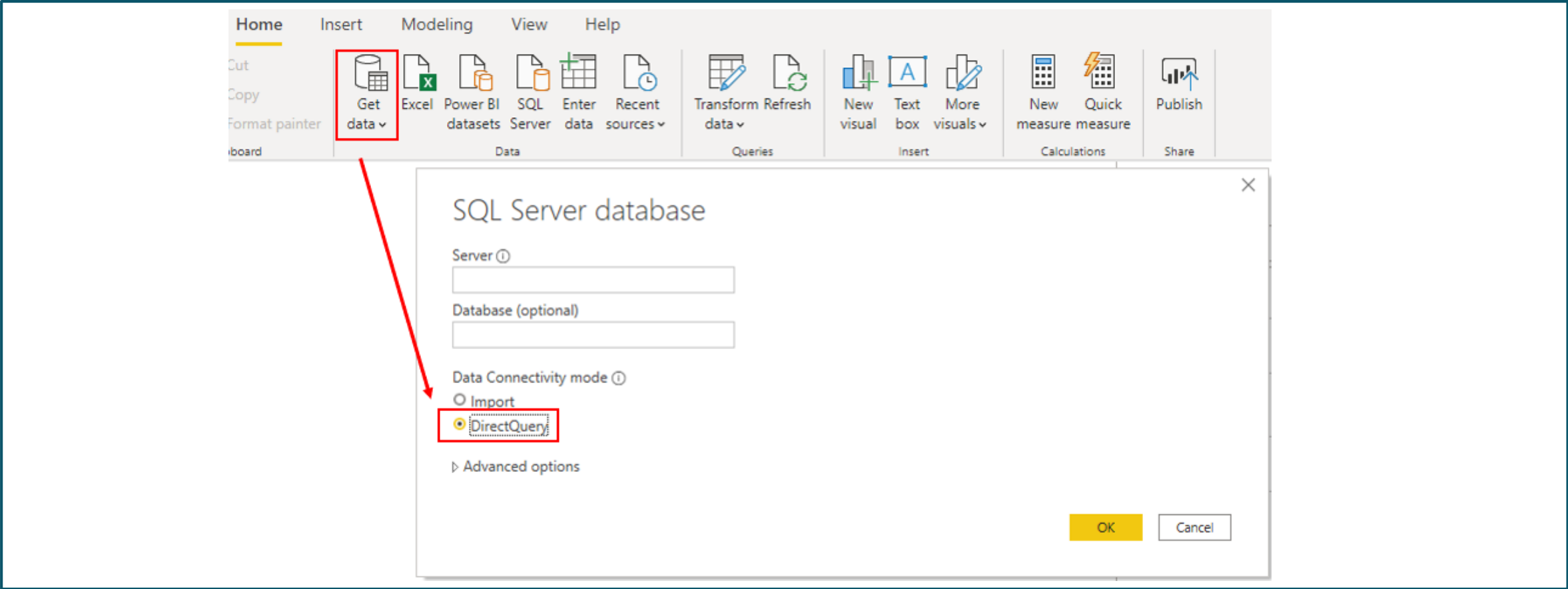
- **Q01 – What benefit do you get from analyzing metadata?**
 - A01 – The benefit of analyzing metadata is that you can clearly identify data inconsistencies with your dataset.
- **Q02 – Which tool enables you to identify bottlenecks that exist in code?**
 - A02 – Performance Analyzer
- **Q03 – What is cardinality?**
 - A03 – The direction that the data flows in a relationship between tables.

Lesson 2: Optimize DirectQuery Models



Introduction to DirectQuery

Connect directly to your data source repository.



Implications of using DirectQuery

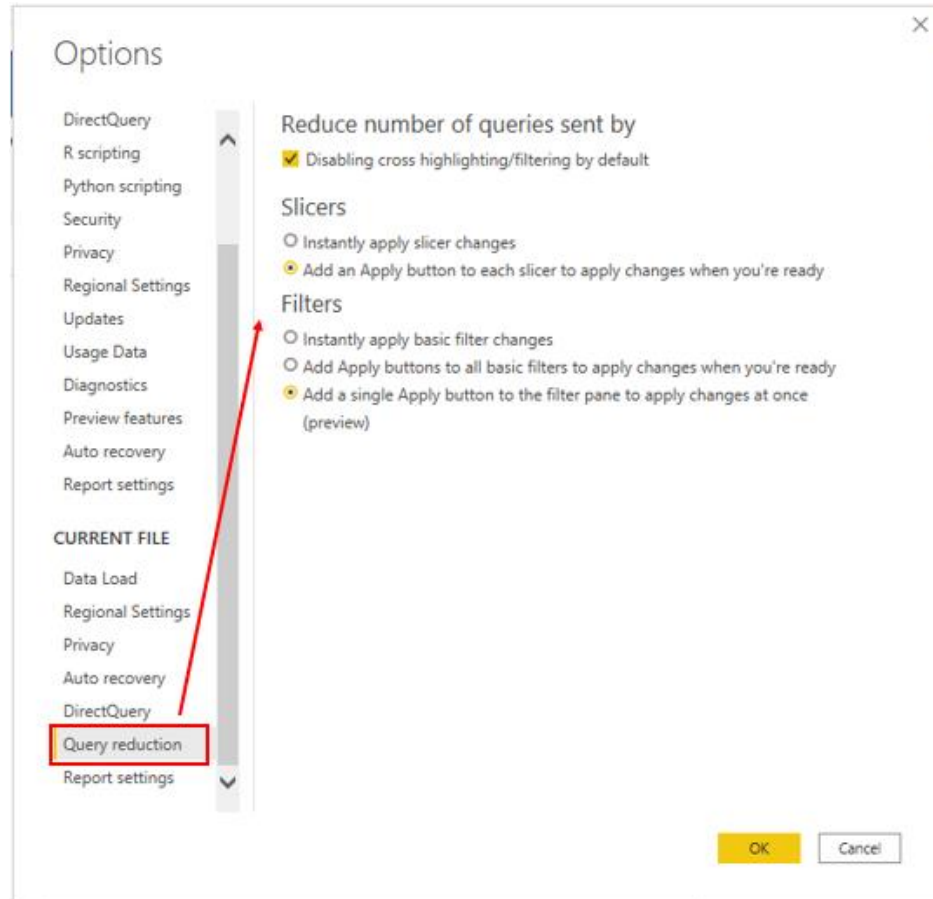
Benefits:

- 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

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.

Module Overview

We covered the following concepts:

- Data model performance optimization
- DirectQuery model optimization

References

PL-300 Optimize a model for performance in Power BI

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

