- Section I: Data Modeling in Power BI
- Introduction to Data Modeling in Power BI

Understanding the Power BI layers
The data preparation layer (Power Query)
The data model layer
The Data view
The Model view
The data visualization layer
The Report view
How data flows in Power BI
What data modeling means in Power BI
Semantic model
Building an efficient data model in Power BI
Star schema (dimensional modeling) and snowflaking
Transactional modeling versus star schema modeling
Snowflaking
Understanding denormalization
Power BI licensing considerations
Maximum size of an individual dataset
Incremental data load
Hybrid tables
Calculation groups
Shared datasets
Power BI Dataflows
Power BI Datamarts
The iterative data modeling approach
Conducting discovery workshops
Data preparation based on the business logic
Data modeling
Testing the logic
Demonstrating the business logic in basic data visualizations
Thinking like a professional data modeler
Summary

- Data Analysis eXpressions and Data Modeling

Understanding virtual tables
Creating calculated tables
Visually displaying the results of virtual tables
Creating calculated tables in Power BI Desktop
Using DAX Studio
Understanding relationships in virtual tables
Time intelligence and data modeling
Detecting valid dates in the date dimension
Period-over-period calculations
Implementing dynamic measure selection with Fields Parameters
Generating the Date dimension with DAX
Marking a Date table as a date table
Creating a time dimension with DAX
Summary

- Section II: Data Preparation in Query Editor
- Data Preparation in Power Query Editor

Introducing the Power Query M formula language in Power BI
Power Query is CaSe-SeNsItIvE
Queries
Expressions
Values
Primitive values
Structured values
Types
Primitive types
Custom types
Introduction to Power Query Editor
Queries pane
Tables
Custom functions
Query parameters
Constant values
Groups
Query Settings pane
Query Properties
Applied Steps
Data View pane
Status bar
Advanced Editor
Introduction to Power Query features for data modelers
Column quality
Column distribution
Column profile
Understanding query parameters
Understanding custom functions
Recursive functions
Summary

- Getting Data from Various Sources

Getting data from common data sources
Folders
CSV/Text/TSV
Excel
Excel file stored in local drive
Excel file stored in SharePoint Online
Power BI datasets
Power BI dataflows
Power BI Datamarts
SQL Server
SQL Server Analysis Services and Azure Analysis Services
SSAS multidimensional/tabular
AAS
OData feed

Dataverse
Understanding data source certification
Bronze
Silver
Gold/Platinum
Working with connection modes
Data Import
Applications
Limitations
DirectQuery
Applications
Limitations
Connect Live
Applications
Limitations
Working with storage modes
Understanding dataset storage modes
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- Common Data Preparation Steps

Data type conversion
Splitting a column by delimiter
Merging columns
Adding a custom column
Adding a column from examples
Duplicating a column
Filtering rows
Working with Group By
Appending queries
Merging queries
Duplicating and referencing queries
Replacing values
Extracting numbers from text
Dealing with Date, DateTime, and DateTimeZone
Pivoting tables
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- Star Schema Preparation in Power Query Editor

Identifying dimensions and facts
Understanding business requirements
Number of tables in the data source
The linkages between existing tables
Finding the lowest required grain of Date and Time
Defining dimensions and facts
Determining the potential dimensions
Determining the potential facts
Creating Dimension tables
Geography
Sales order
Product

Currency
Customer
Sales Demographic
Date
Time
Creating Date and Time dimensions – Power Query versus DAX
Creating fact tables
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- Data Preparation Common Best Practices
Consider loading a proportion of data
Appreciate case sensitivity in Power Query
Be mindful of query folding and its impact on data refresh
Understanding query folding
DirectQuery and Dual storage modes and query folding
Data sources and query folding
Indications for query folding
Query folding best practices
Using SQL statements
Push the data preparation to the source system when possible
Disabling View Native Query does not necessarily mean a transformation step is not folded
Organize queries in the Power Query Editor
Follow data type conversion best practices
Data type conversion can affect data modeling
Avoid having columns with any data type
Include the data type conversion in the step when possible
Consider having only one data type conversion step
Optimize query size
Remove unnecessary columns and rows
Summarization (Group by)
Disabling query load
Use query parameters
Parameterizing connections
Restricting the row counts in development for large tables
Define key columns in queries
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- Section III: Data Modeling
- Data Modeling Components
Data modeling in Power BI Desktop
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Table properties
Featured tables
Calculated tables
Understanding fields
Data types
Custom formatting
Columns
Calculated columns

Grouping and binning columns
Column properties
Hierarchies
Measures
Implicit measures
Explicit measures
Textual measures
Using relationships
Primary keys/foreign keys
Handling composite keys
Relationship cardinalities
One-to-one relationships
One to many relationships
Many to many relationships
Filter propagation behavior
Bidirectional relationships
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- Star Schema and Data Modeling Common Best Practices

Dealing with many-to-many relationships
Many-to-many relationships using a bridge table
Hiding the bridge table
Avoiding bidirectional relationships
Dealing with inactive relationships
Reachability via multiple filter paths
Multiple direct relationships between two tables
Using configuration tables
Segmentation
Dynamic color coding with measures
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Organizing the model
Hiding insignificant model objects
Hiding unused fields and tables
Hiding key columns
Hiding implicit measures
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Using folders
Creating a folder in multiple tables in one go
Placing a measure in various folders
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Reducing model size by disabling auto date/time
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- Advanced Data Modeling Techniques

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Configuring incremental refresh policy and hybrid table in Power BI Desktop
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Important notes about incremental refresh and hybrid tables
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Identify the depth of the hierarchy
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Implementing roleplaying dimensions
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Implementing calculation groups to handle time intelligence
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Fixing the format string issue
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- Row-Level and Object-Level Security
What RLS and OLS mean in data modeling
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Rules
Enhanced row-level security editor
Validating roles
Assigning members to roles in the Power BI Service
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Common RLS implementation approaches
Static RLS implementation
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Restricting unauthorized users from accessing data
Managers can access their team members' data in parent-child hierarchies
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- Dealing with More Advanced Data Warehousing Concepts in Power BI
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- Introduction to Dataflows
Introduction to Dataflows
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- DirectQuery Connections to Power BI Datasets and Analysis Services in Composite Models
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Allow DirectQuery connections to Power BI datasets in the Power BI service
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- New Options, Features, and DAX Functions
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What is Power BI Datamarts?
Demystifying Power BI Datamart misunderstandings
The Datamart Editor
Create a simple Power BI Datamart
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