



# ENHANCING POWER BI DEVELOPMENT: IT IS FUN TO STAY AT THE T-M-D-L

Jason Romans





# JASON ROMANS



Principal Consultant  
P3 Adaptive



The Dax Shepherd



Live in Nashville, Tennessee



Started as SQL Server DBA



Transitioned to the Microsoft BI Stack



SSIS, SSAS, SQL Server, and Power BI



Simple Talk Author



Favorite Data Model

# SLIDES AND DEMOS

- Main
  - <https://github.com/thedaxshepherd>
- This Presentation
  - <https://github.com/thedaxshepherd/Presentations/tree/main/Events/UserGroups/2025/March/NashvillePowerBIUserGroup>

# SHOULDERS OF GIANTS



# The TMDL Journey

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1. What is TMDL
2. PBIP TMDL
3. TMDL View
4. External Tools
5. Conclusion

# The TMDL Journey



- 1. What is TMDL**
2. PBIP TMDL
3. TMDL View
4. External Tools
5. Conclusion



# IN THE BEGINNING...

- SQL Server Analysis Services
  - One Large BIM File
  - Tabular Model Scripting Language (TMSL)
    - JSON Format
- Tabular Editor started as a glorified JSON editor
  - Daniel Otykier Creator

# Model.Bim File in Power BI

```
{ } model.bim X
Contoso10K - Copy.SemanticModel > { } model.bim > { } model > [ ] cultures > { } 0
3      "model": {
44      "relationships": [
112      }
113  ],
114  "sourceQueryCulture": "en-US",
115  "tables": [
116      {
117          "name": "Product",
118          "annotations": [
119              {
120                  "name": "PBI_ResultType",
121                  "value": "Table"
122              }
123          ],
124          "columns": [
125              {
126                  "name": "ProductKey",
127                  "annotations": [
128                      {
129                          "name": "SummarizationSetBy",
130                          "value": "Automatic"
131                      }
132                  ]
133              }
134          ]
135      }
136  ]
137  }
```



# ISSUES WITH A SINGLE LARGE BIM FILE

- Difficult to comprehend
  - Too much text is focused on brackets and parentheses
- A single, large file makes it harder to collaborate with others
  - Less of an issue with one developer managing SQL Server Analysis Services Tabular in Visual Studio
- Power BI and Fabric are moving towards implementing Version Control for everything
  - Does it exist if it is not in source control?

WHAT'S IN A NAME

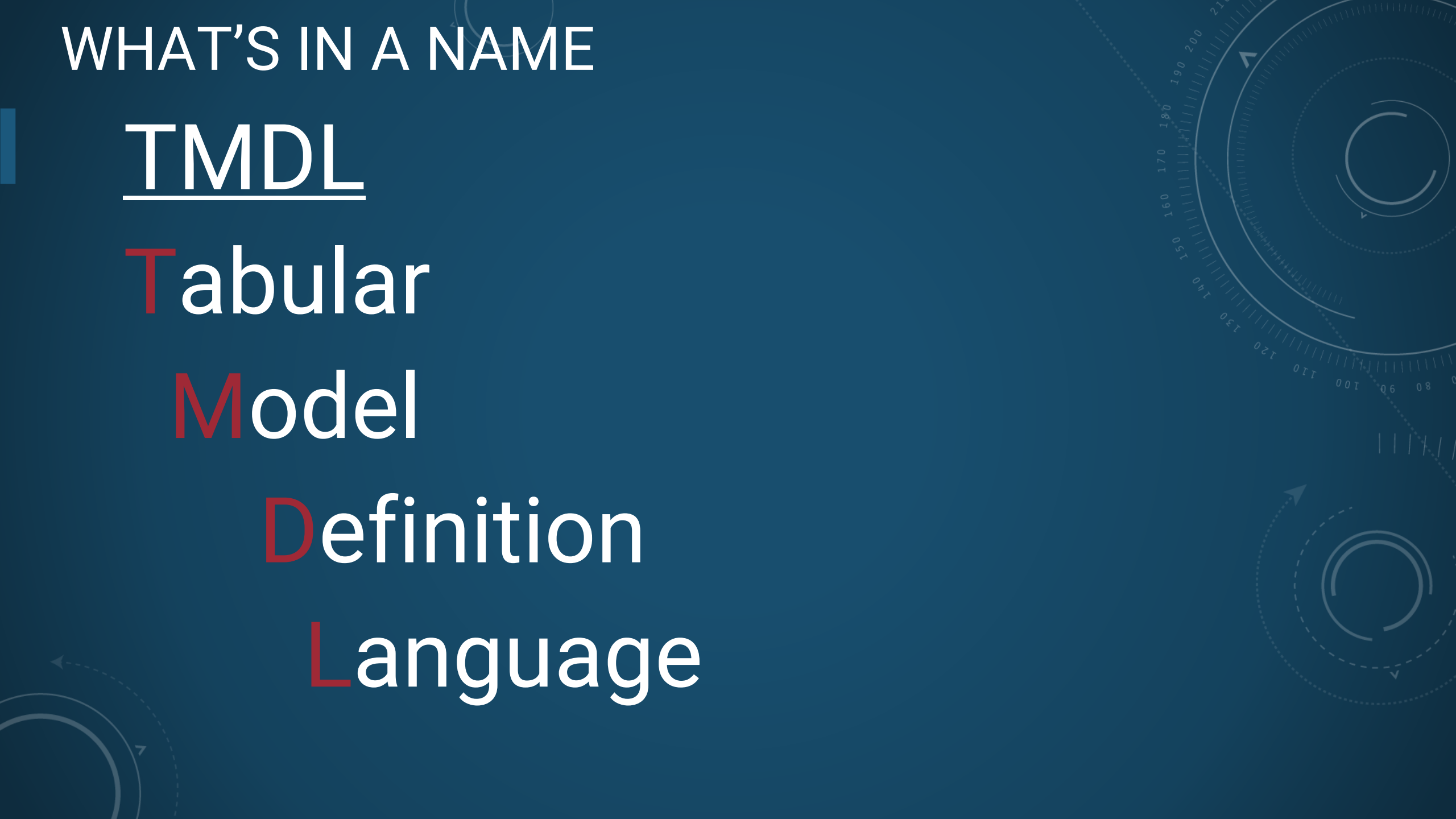
TMDL

Tabular

Model

Definition

Language



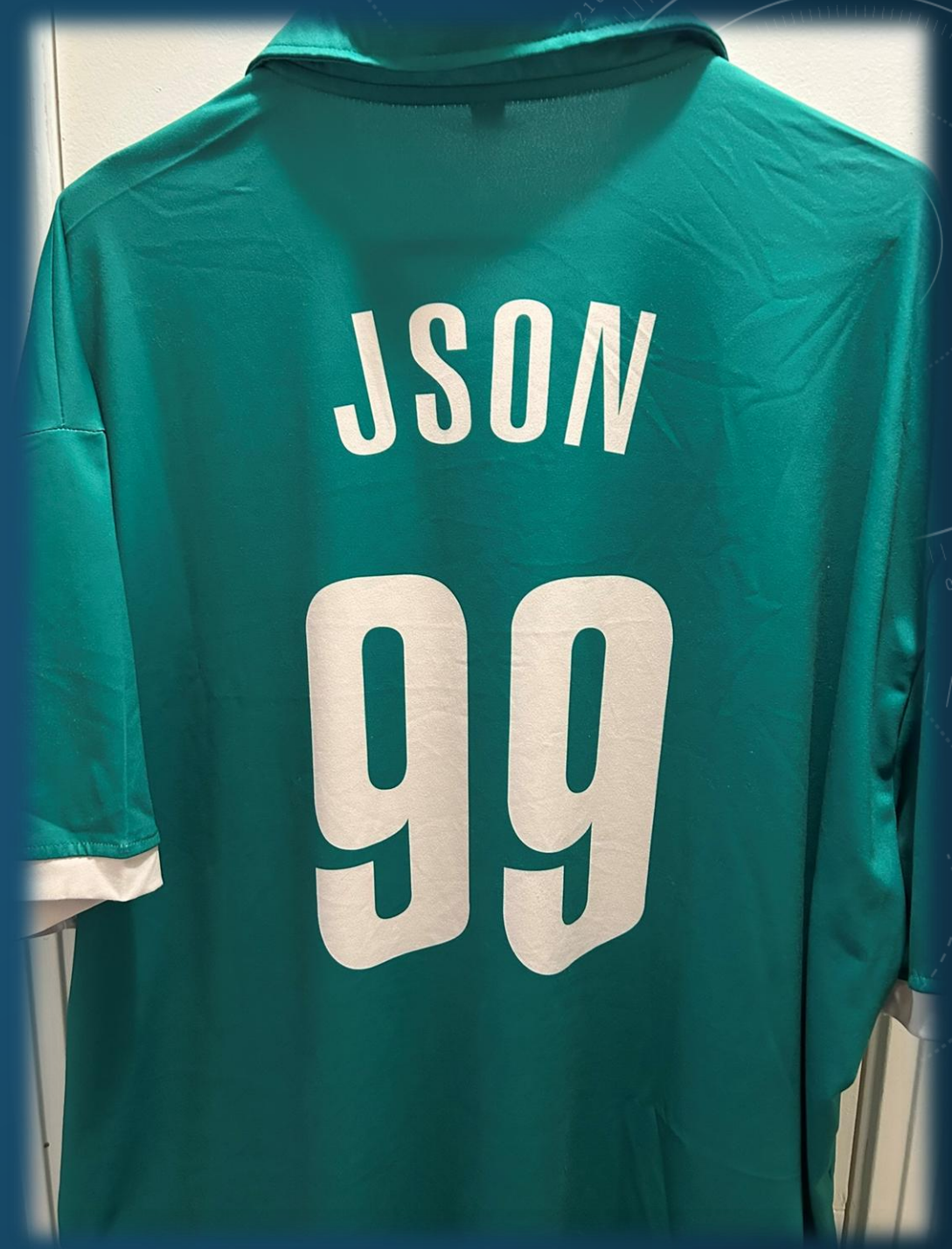
# TMDL

- Readability – similar to YAML
- Folder structure – separate files for each table, perspective, role, and culture
  - Increases collaboration
- Minimal delimiters
- Copilot



# WHAT IT IS NOT

THIS IS NOT IN JSON FORMAT.



# TMDL CREDIT

- Mathias Thierbach
  - Microsoft MVP
  - pbi-tools
- Community involvement

# Example of TMDL

```
↑ Apply Share feedback
```

```
1 createOrReplace
2
3   table Date
4     lineageTag: 093cc89d-ab2b-423e-9810-be9d879345e1
5
6     column Date
7       dataType: dateTime
8       formatString: Long Date
9       lineageTag: 0bbfcfc4-20b3-48c4-b1d8-b3580bde1eee
10      summarizeBy: none
11      sourceColumn: Date
12
13      variation Variation
14        isDefault
15        relationship: 37085089-049c-4234-b43a-e3597a7dc57c
16        defaultHierarchy: LocalDateTable_ea6f4596-8c52-4f28-aa0b-fe443aed061.'Date
17        Hierarchy'
18
19      annotation SummarizationSetBy = Automatic
20
21      annotation UnderlyingDateTimeDataType = Date
22
23      column Year
24        dataType: int64
25        formatString: 0
26        lineageTag: 7de18a58-8189-4a64-a8b9-9b278f40a9d2
27        summarizeBy: sum
28        sourceColumn: Year
29
30      annotation SummarizationSetBy = Automatic
31
32      column 'Year Quarter'
33        dataType: string
34        lineageTag: c5f3bb74-3d89-40e7-9087-7b2e02783535
35        summarizeBy: none
36        sourceColumn: Year Quarter
37
38      annotation SummarizationSetBy = Automatic
39
40      column 'Year Quarter Number'
41        dataType: int64
```

Problems 0 Output

Script 2 +



# Quick TMDL Primer

- Whitespace for indenting
- Hierarchy
  - Table
    - Column
    - Measure
      - Properties
- Triple slash (///) syntax
  - Description – good for documentation
    - For example /// Table Description



# The TMDL Journey



1. What is TMDL
- 2. PBIP TMDL**
3. TMDL View
4. External Tools
5. Conclusion

# TMDL IN POWER BI DESKTOP

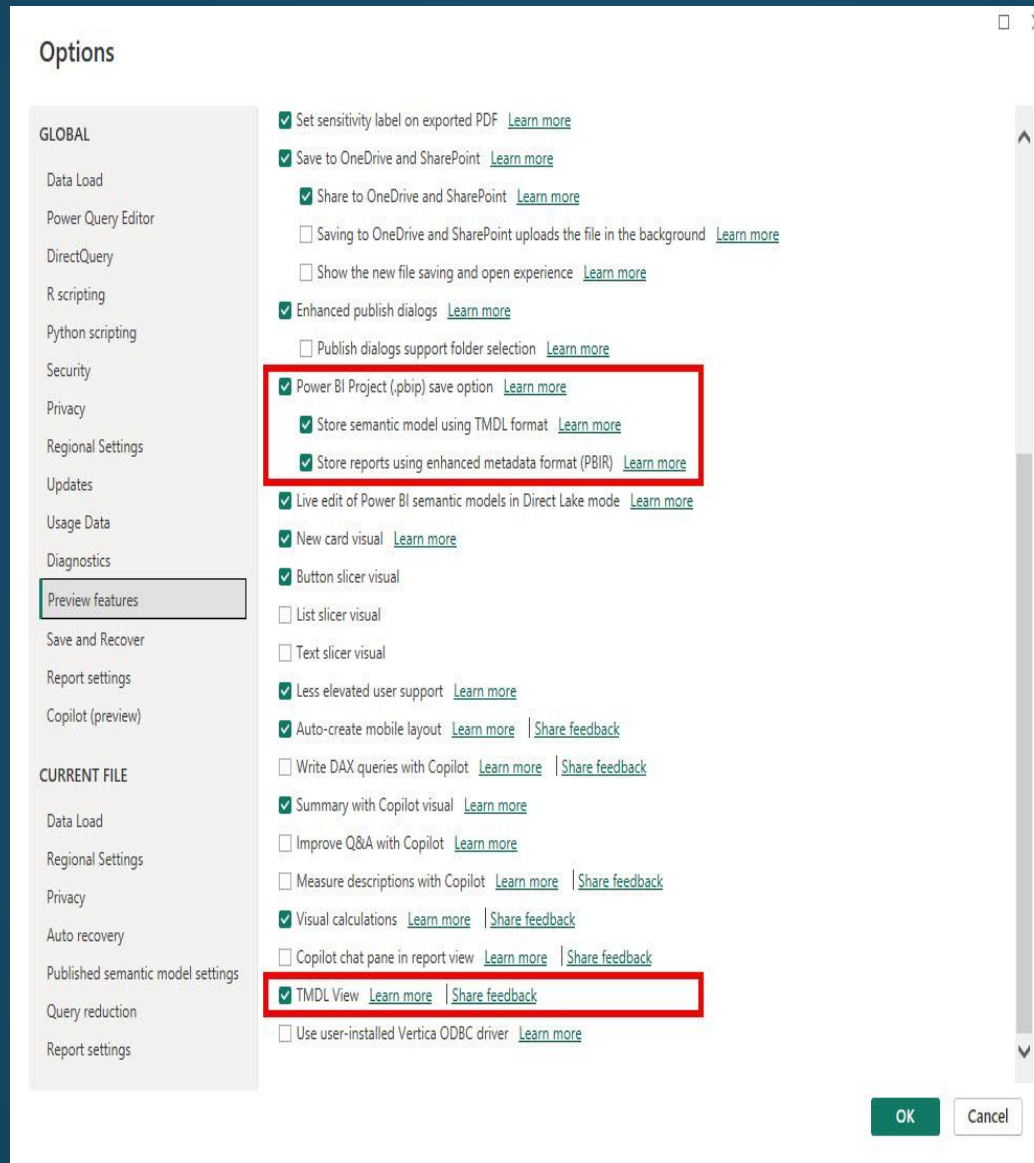
Related but independent

- Power BI Project (.pbip)
  - Store semantic model in TMDL format
- TMDL View
  - Can be used with PBIX files



# PREVIEW OPTIONS

## **\*\*Preview: Read limitations \*\***



# LEARN MORE

- ☒ Power BI Project (.pbip) save option [Learn more](#)
- ☒ Store semantic model using TMDL format [Learn more](#)
  - ☒ Store reports using enhanced metadata format (EMR) [Learn more](#)
- ☒ Live edit of Power BI semantic models in Direct Lake mode [Learn more](#)
- ☒ New card visual [Learn more](#)
- ☒ Button slicer visual
- ☐ List slicer visual
- ☐ Text slicer visual
- ☒ Less elevated user support [Learn more](#)
- ☒ Auto-create mobile layout [Learn more](#) | [Share feedback](#)
- ☐ Write DAX queries with Copilot [Learn more](#) | [Share feedback](#)
- ☒ Summary with Copilot visual [Learn more](#)
- ☐ Improve Q&A with Copilot [Learn more](#)
- ☐ Measure descriptions with Copilot [Learn more](#) | [Share feedback](#)
- ☒ Visual calculations [Learn more](#) | [Share feedback](#)
- ☐ Copilot chat pane in report view [Learn more](#) | [Share feedback](#)
- ☒ TMDL View [Learn more](#) | [Share feedback](#)
- ☐ Use user-installed Vertica ODBC driver [Learn more](#)

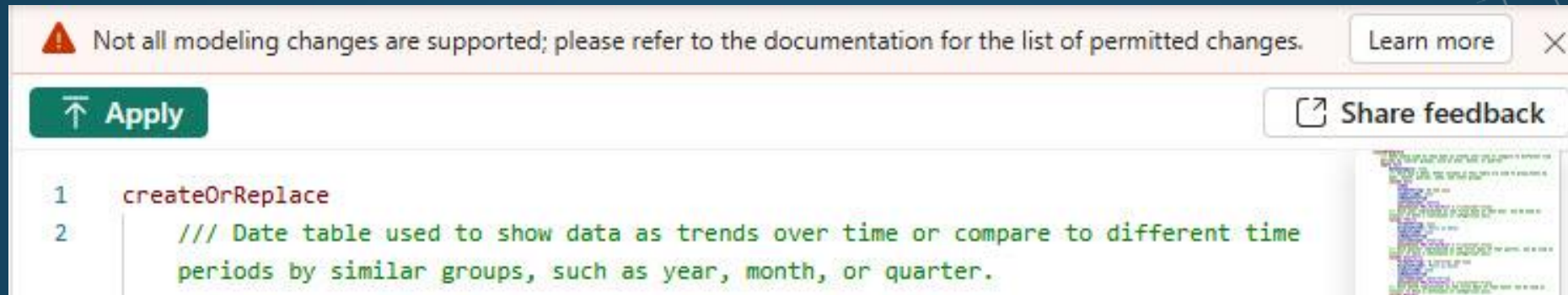
# TMDL IN POWER BI DESKTOP

## 1. Power BI Project (.pbip)

- Store semantic model in TMDL format









# WARNING

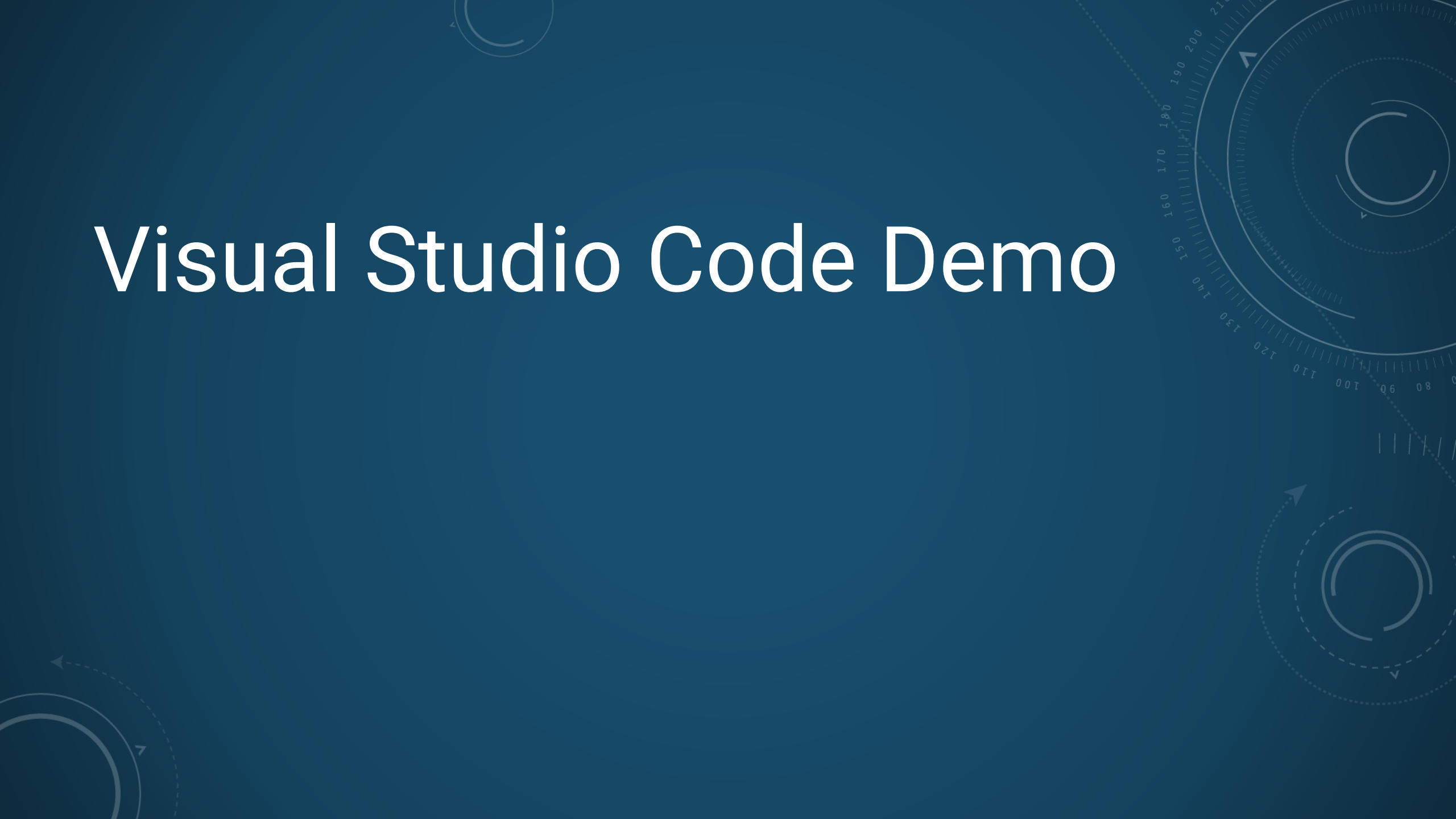


Learn More: <https://learn.microsoft.com/en-us/power-bi/developer/projects/projects-overview#model-authoring>

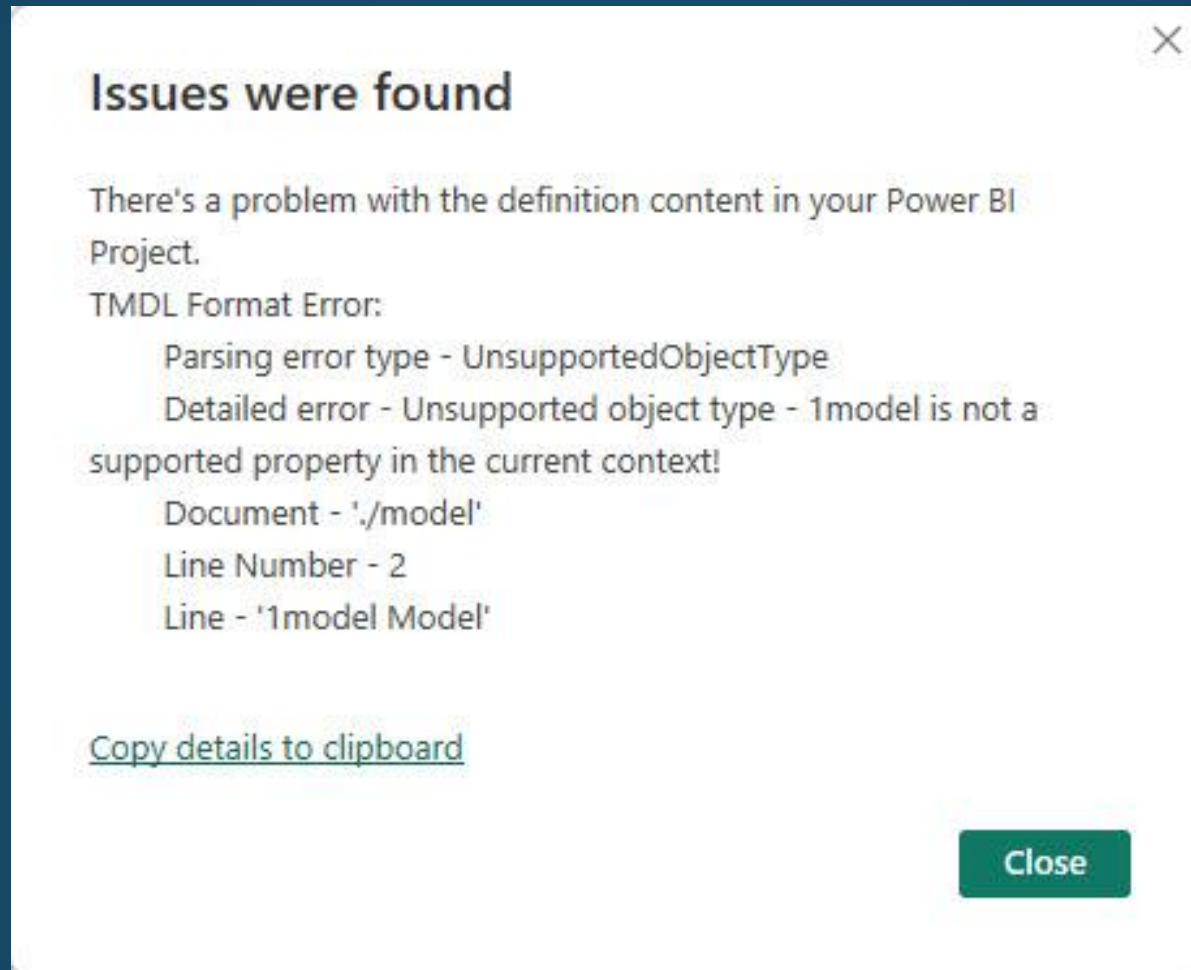
# FOLDER RENAMING IS NOT VERSION CONTROL

Name	Status	Date modified	Type	Size
BeforeBossFight_Original_Power_BI		3/20/2025 9:23 AM	File folder	
Broken_Original_Power_BI		3/20/2025 9:23 AM	File folder	
Lost_Original_Power_BI		3/20/2025 9:24 AM	File folder	
Original_Power_BI		3/20/2025 9:22 AM	File folder	
Restore_of_Restore_Original_Power_BI		3/20/2025 9:24 AM	File folder	
zOriginal_Power_BI		3/20/2025 9:22 AM	File folder	

# Visual Studio Code Demo



# POWER BI – TMDL ISSUE





# Our Journey



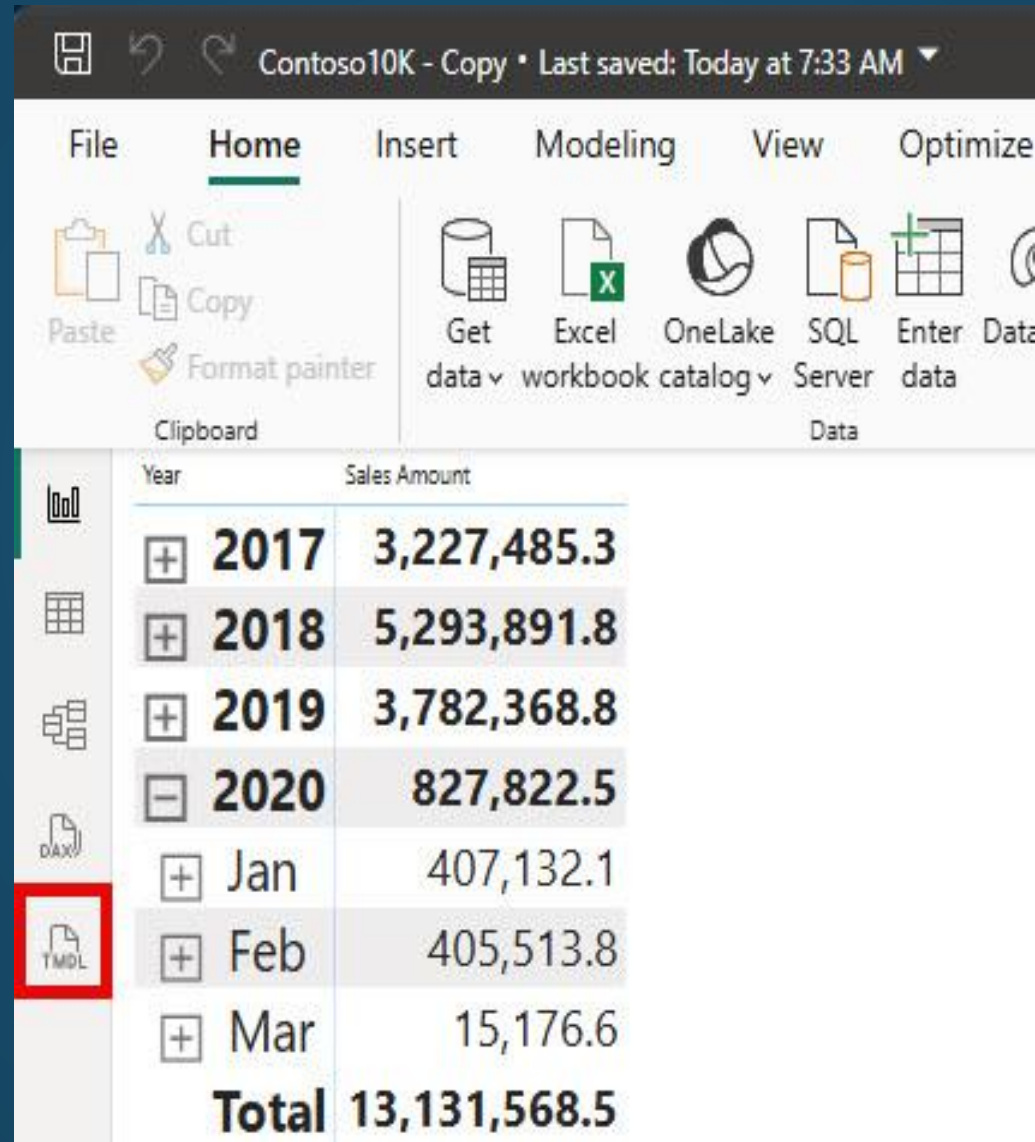
1. What is TMDL
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# TMDL IN POWER BI DESKTOP

## 2.TMDL View

- Can be used with PBIX files

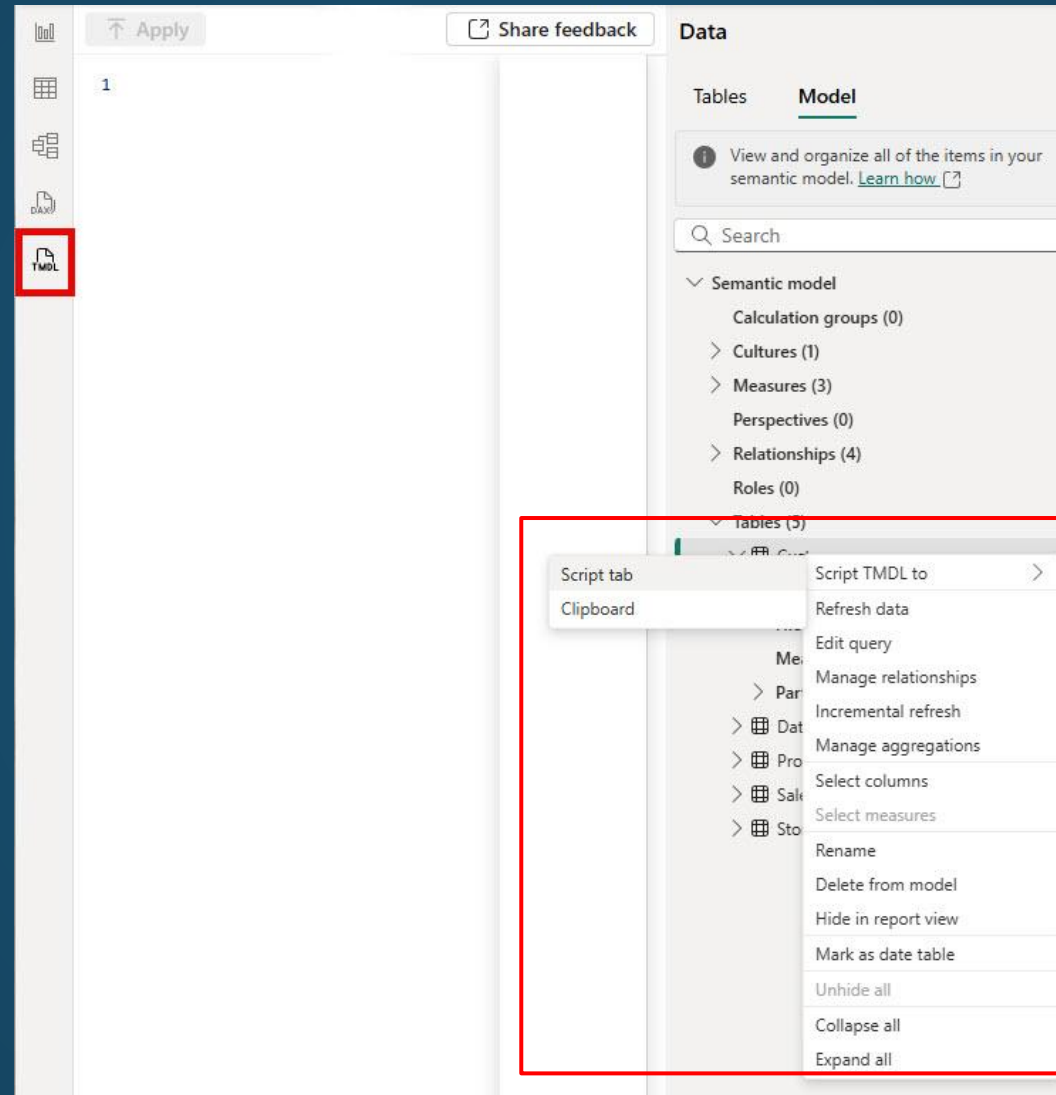
# TMDL VIEW BUTTON



The screenshot displays the Microsoft Power BI Desktop application window. The title bar indicates the file is "Contoso10K - Copy" and it was last saved today at 7:33 AM. The ribbon is set to the "Home" tab, showing options for File, Home, Insert, Modeling, View, and Optimize. The left-hand navigation pane contains several icons: a bar chart, a table, a hierarchy, a DAX query, and a TMDL (Table Model Definition Language) icon, which is highlighted with a red square. The main workspace shows a table with the following data:

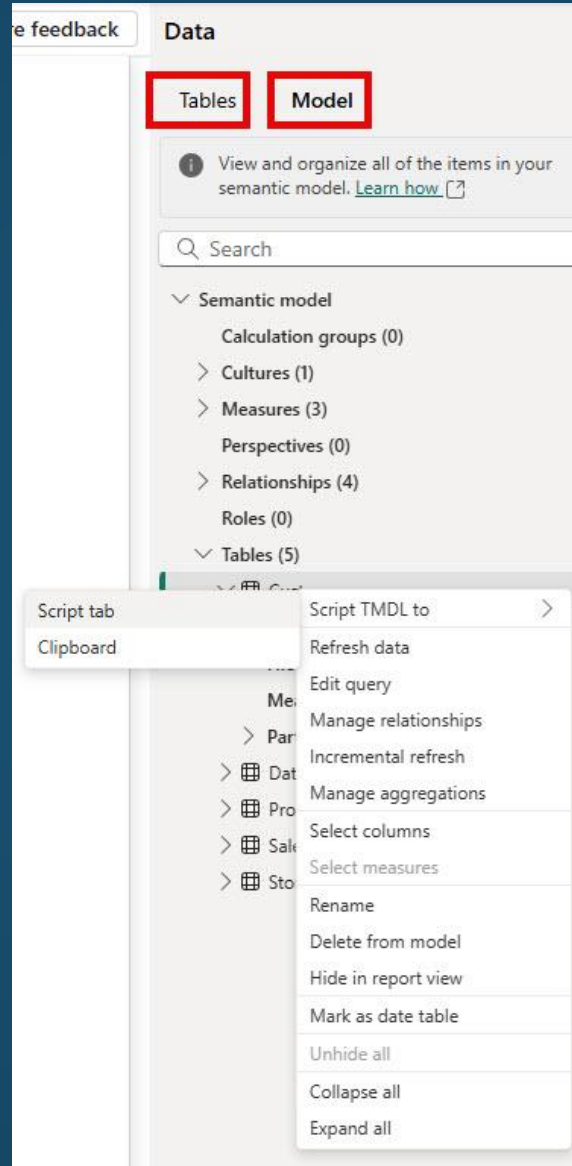
Year	Sales Amount
+ 2017	3,227,485.3
+ 2018	5,293,891.8
+ 2019	3,782,368.8
- 2020	827,822.5
+ Jan	407,132.1
+ Feb	405,513.8
+ Mar	15,176.6
<b>Total</b>	<b>13,131,568.5</b>

# SCRIPT TMDL



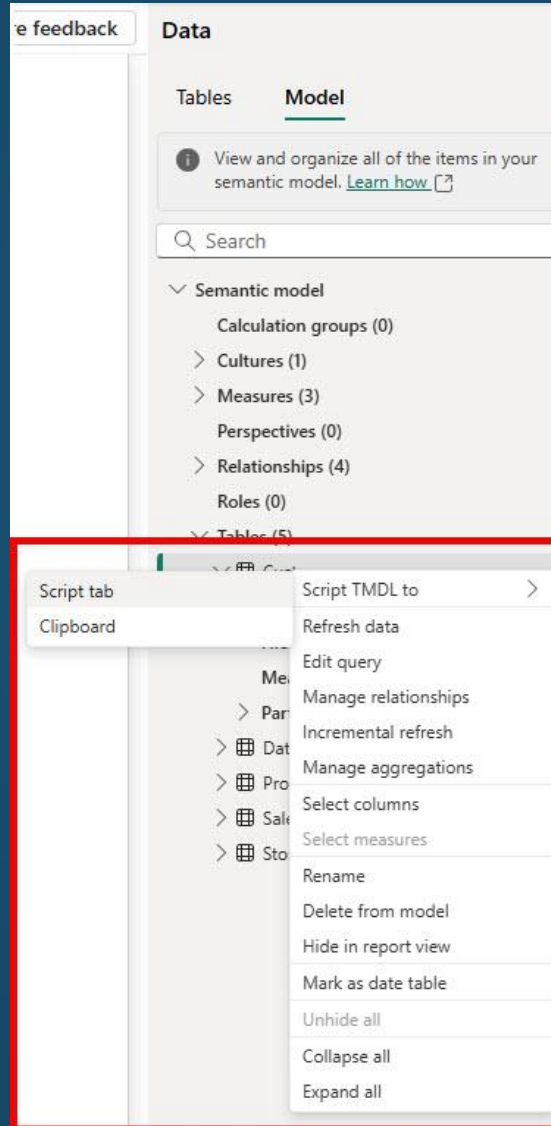


# CAN BE IN TABLE OR MODEL SELECTION

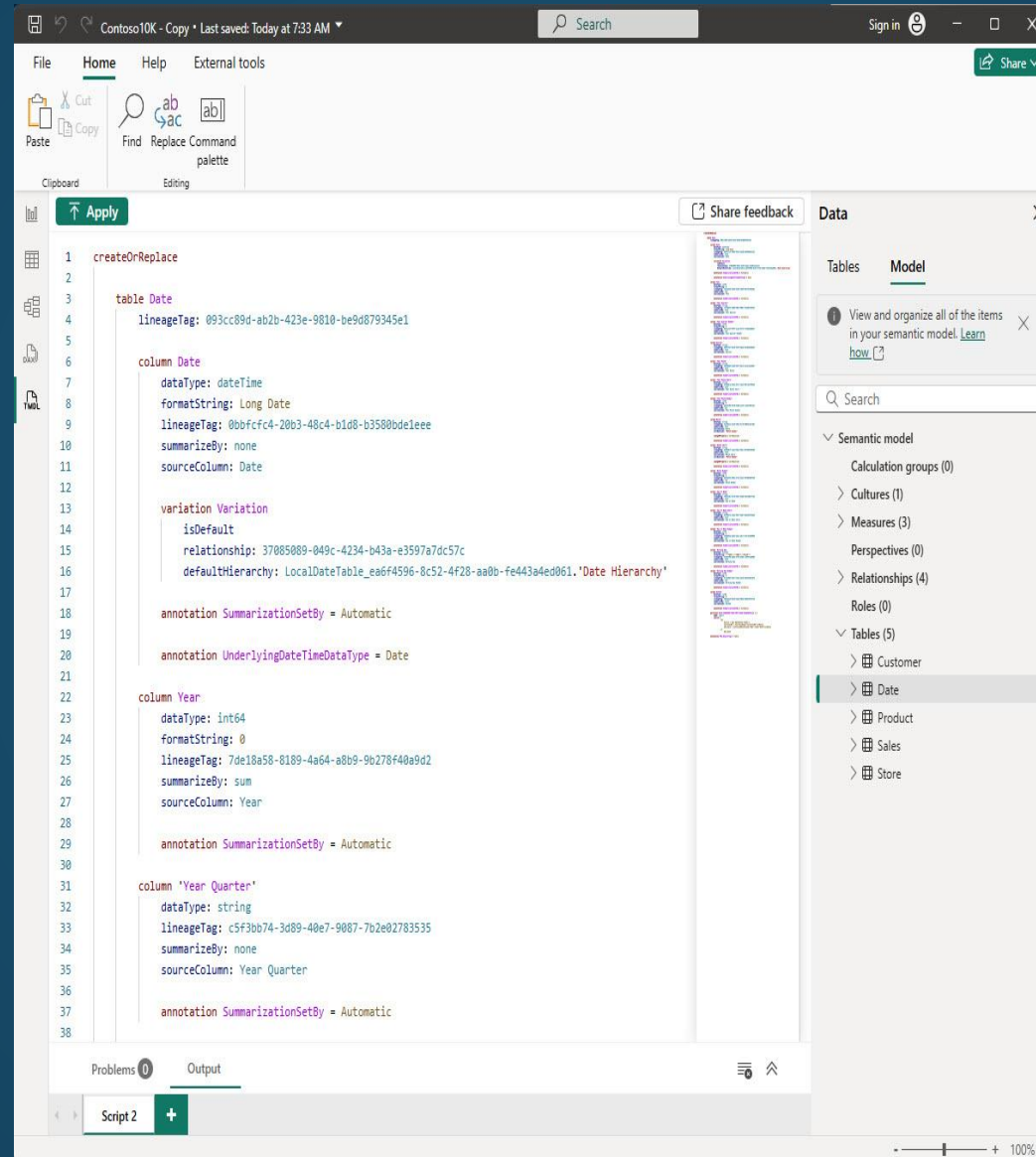


# CAN SCRIPT TO SCRIPT TAB OR CLIPBOARD

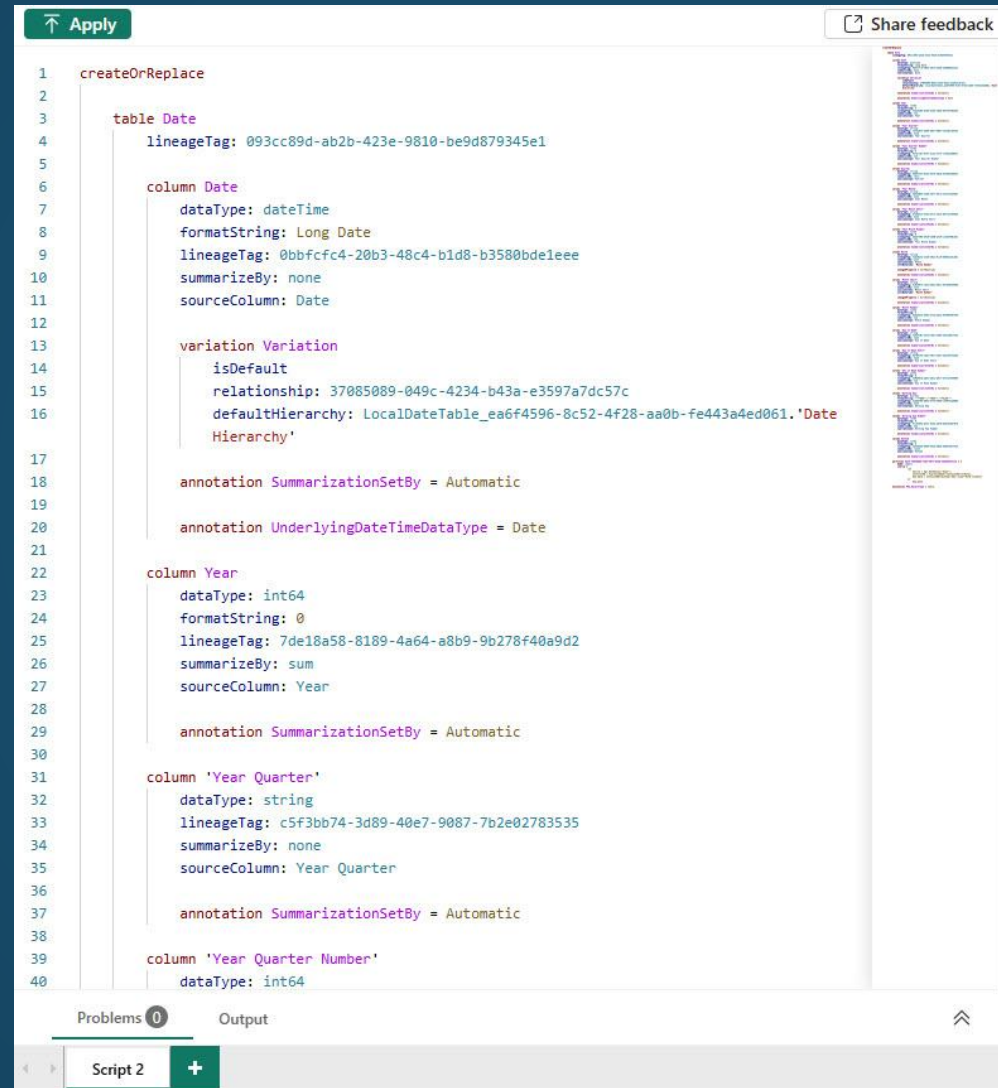
**\*\* ALSO DRAG AND DROP TO TAB \*\***



# TMDL VIEW – SCRIPT TAB



# TMDL VIEW – CODE INTERFACE

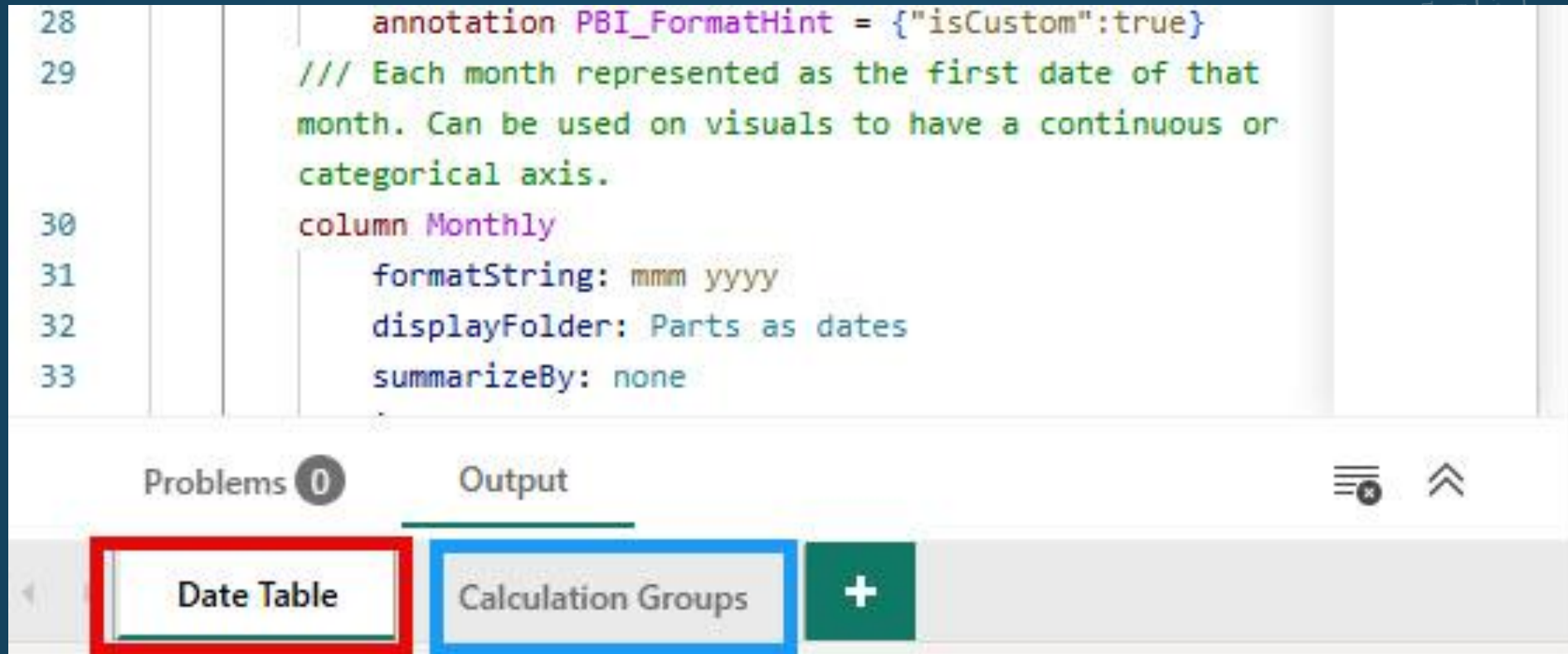


The screenshot displays the TMDL View Code Interface, which is a code editor for configuring data models. The interface includes a top bar with an 'Apply' button and a 'Share feedback' link. The main area shows a JSON-like configuration for a table named 'Date'. The configuration includes a 'lineageTag', a 'column Date' with various attributes like 'dataType', 'formatString', 'lineageTag', 'summarizeBy', and 'sourceColumn', a 'variation Variation' with 'isDefault', 'relationship', and 'defaultHierarchy', and several annotations like 'SummarizationSetBy' and 'UnderlyingDateTimeDataType'. The bottom of the interface has a 'Problems' tab with 0 errors and an 'Output' tab, and a 'Script 2' button with a plus icon.








```
1 createOrReplace
2
3 table Date
4   lineageTag: 093cc89d-ab2b-423e-9810-be9d879345e1
5
6   column Date
7     dataType: dateTime
8     formatString: Long Date
9     lineageTag: 0bbfcfc4-20b3-48c4-b1d8-b3580bde1eee
10    summarizeBy: none
11    sourceColumn: Date
12
13    variation Variation
14      isDefault
15      relationship: 37085089-049c-4234-b43a-e3597a7dc57c
16      defaultHierarchy: LocalDateTable_ea6f4596-8c52-4f28-aa0b-fe443a4ed061.'Date
17      Hierarchy'
18
19    annotation SummarizationSetBy = Automatic
20
21    annotation UnderlyingDateTimeDataType = Date
22
23   column Year
24     dataType: int64
25     formatString: 0
26     lineageTag: 7de18a58-8189-4a64-a8b9-9b278f40a9d2
27     summarizeBy: sum
28     sourceColumn: Year
29
30    annotation SummarizationSetBy = Automatic
31
32   column 'Year Quarter'
33     dataType: string
34     lineageTag: c5f3bb74-3d89-40e7-9087-7b2e02783535
35     summarizeBy: none
36     sourceColumn: Year Quarter
37
38    annotation SummarizationSetBy = Automatic
39
40   column 'Year Quarter Number'
41     dataType: int64
```



# TMDL VIEW – RENAME TABS



# TMDL SCRIPTS – SAVED IN FILE (PBIP/PBIX)

Name	Date modified	Type	Size
 .pbi	3/17/2025 8:41 AM	File folder	
 DAXQueries	3/17/2025 8:41 AM	File folder	
 TMDLScripts	3/17/2025 8:41 AM	File folder	
 .platform	3/17/2025 8:41 AM	PLATFORM File	1 KB
 definition.pbism	3/17/2025 8:41 AM	PBISM File	1 KB
 diagramLayout.json	3/17/2025 8:41 AM	JSON File	2 KB
 model.bim	3/17/2025 8:41 AM	BIM File	79 KB

ENABLES FUNCTIONALITIES WITHOUT EXTERNAL TOOL

For example:

- Perspectives
- Translations

# FabSnippets

- Various code snippets for Fabric
  - TMDL
  - DAX
  - Python
  - PowerQuery
  - AI Prompts
- Has a leaderboard



# FabSnippets

## DAX Date table by DataZoe

Submitted by [DataZoe](#) on 2/28/2025

TMDL

```
createOrReplace
```

```
    /// Date table used to show data as trends over time or compare to  
    different time periods by similar groups, such as year, month, or quarter.
```

```
    table Date
```

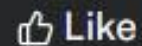
```
        dataCategory: Time
```

```
        /// Each day's date. Other columns in this table are used to group  
        dates by year, month, quarter, week, and other groups.
```

```
        column Date
```

7 likes

2 comments



Like



Comment

# FabSnippets – DAX Date Table by DataZoe

↑ Apply

Share feedback

```
1 createOrReplace
2   /// Date table used to show data as trends over time or compare to different time periods by similar groups, such
3   as year, month, or quarter.
4   table Date
5     dataCategory: Time
6     /// Each day's date. Other columns in this table are used to group dates by year, month, quarter, week, and
7     other groups.
8     column Date
9       isKey
10      formatString: dd mmm yyyy
11      summarizeBy: none
12      isNameInferred
13      sourceColumn: [Date]
14      annotation PBI_FormatHint = {"isCustom":true}
15    /// Each year represented as the first date of that year. Can be used on visuals to have a continuous or
16    categorical axis.
17    column Yearly
18      formatString: yyyy
19      displayFolder: Parts as dates
20      summarizeBy: none
21      isNameInferred
22      sourceColumn: [Yearly]
23      annotation PBI_FormatHint = {"isCustom":true}
24    /// Each quarter represented as the first date of that quarter. Can be used on visuals to have a continuous or
25    categorical axis.
26    column Quarterly
27      formatString: "Q starting" mmm yyyy
28      displayFolder: Parts as dates
29      summarizeBy: none
30      isNameInferred
31      sourceColumn: [Quarterly]
32      annotation PBI_FormatHint = {"isCustom":true}
33    /// Each month represented as the first date of that month. Can be used on visuals to have a continuous or
34    categorical axis.
35    column Monthly
36      formatString: mmm yyyy
```

# Share TMDL Scripts

- Centralized collection
  - SharePoint site
  - Teams
- Copy text and share it.

# TMDL View Demo





# The TMDL Journey



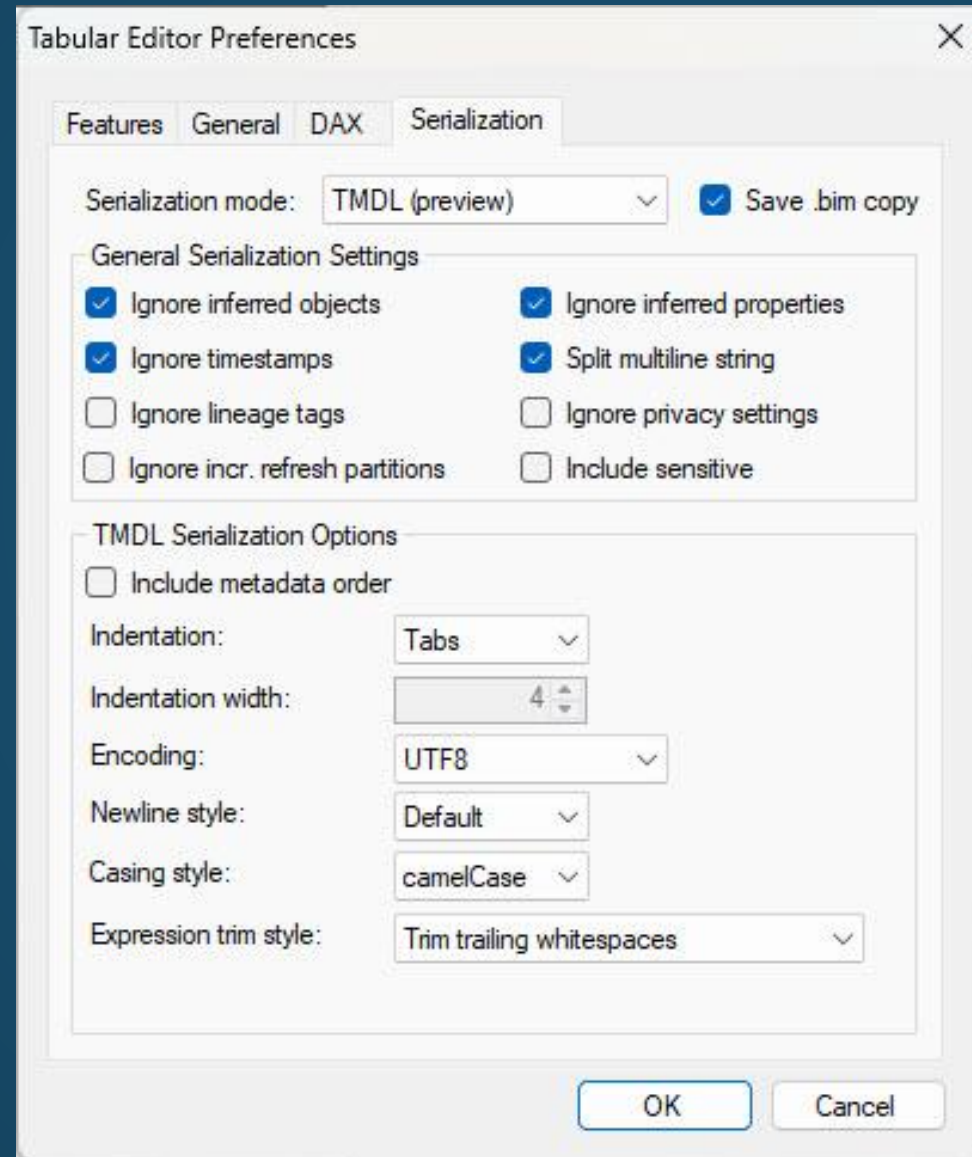
1. What is TMDL
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# EXTERNAL TOOLS

- Visual Studio Code
  - TMDL Extension
  - Power BI Studio
- pbi-tools
- Tabular Editor



# TABULAR EDITOR 2.X – SAVE TO FOLDER – TMDL (PREVIEW)



# TABULAR EDITOR 3

Preferences

- ▼ Data Browsing
  - Pivot Grid
  - DAX Query
  - Table Preview
- ▼ Text Editors
  - General
  - › DAX Editor
  - › SQL Editor
  - › M Editor
  - › C# Editor
  - Schema Compare
- ▼ File Formats
  - General
  - Save-to-folder**
  - VertiPaq Analyzer
- ▼ Model Deployment
  - General
  - Data Refresh
- ▼ DAX Optimizer
  - General

**Save-to-folder**

Serialization mode: TMDL

**TMDL settings**

☐ Include metadata order

Indentation: Tabs

Indentation width: 4

Encoding: UTF8

Newline style: Default






Casing style: camelCase

Expression trim style: Trim trailing whitespaces

OK Cancel



# TABULAR EDITOR 2 – SAVE TO FOLDER

Name	Date modified	Type	Size
 cultures	3/14/2025 10:48 AM	File folder	
 tables	3/14/2025 10:48 AM	File folder	
 database.tmdl	3/14/2025 10:49 AM	TMDL File	1 KB
 model.tmdl	3/14/2025 10:49 AM	TMDL File	2 KB
 relationships.tmdl	3/14/2025 10:49 AM	TMDL File	2 KB

# The TMDL Journey



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# FUTURE EXPANSION

- A preview displaying the differences between the current version and the script
- Expanding support for changes that are not currently supported
- TMDL View available on the Web
- TMDL View Copilot

Reference:

<https://powerbi.microsoft.com/en-us/blog/deep-dive-into-tmdl-view-for-power-bi-desktop-preview/>

# RESOURCES

- Microsoft TMDL Overview
  - <https://learn.microsoft.com/en-us/analysis-services/tmdl/tmdl-overview>
- Developer Mode
  - <https://learn.microsoft.com/en-us/power-bi/developer/projects/projects-dataset#tmdl-format>
- TMDL View
  - <https://learn.microsoft.com/en-us/power-bi/transform-model/desktop-tmdl-view>

# RESOURCES

- FabSnippets
  - [\*\*https://fabsnippets.com/\*\*](https://fabsnippets.com/)
- DataZoe – DAX Date table in TMDL
  - [\*\*https://www.datazoe.blog/post/dax-date-table-in-tmdl\*\*](https://www.datazoe.blog/post/dax-date-table-in-tmdl)



# RESOURCES

- Deep dive into TMDL view for Power BI Desktop
  - <https://powerbi.microsoft.com/en-us/blog/deep-dive-into-tmdl-view-for-power-bi-desktop-preview/>
- Microsoft Lineage Tags
  - <https://learn.microsoft.com/en-us/analysis-services/tom/lineage-tags-for-power-bi-semantic-models>

Hope you enjoyed your stay

# Thank you

Jason Romans  
thedaxshepherd@gmail.com  
www.thedaxshepherd.com



The Dax Shepherd

