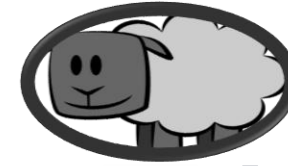


***Power BI and External Tools:
This is the way***

**SQL Saturday Orlando
October 2024**

Jason Romans

Senior BI Engineer
Builder of Models



The Dax Shepherd



Lives in Nashville, Tennessee, United States



Started as SQL Server DBA



Transitioned to the Microsoft BI Stack



Work on everything from SQL Server Integration Services, SQL Server Database, Analysis Services, and Power BI

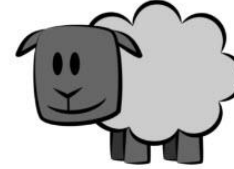


Simple Talk Author at Redgate



Favorite Data Model

www.thedaxshepherd.com



The DAX Shepherd

Musings on the Microsoft BI Stack



[Home](#) [About Me](#) [Simple Talk](#) [Presentations](#) [A Speaker's Journey](#)

Slides

Presentations

Sessionize

This is my [Sessionize Profile](#) that has the conferences I have spoken at along with future events. It has a couple of my most popular sessions.

Presentation Slides

This is my [GitHub Repository](#) with the presentation slides for each event.

Recorded Sessions

Simple Talks Podcast | Episode 4 – Coffee chat with Jason Romans

About Jason Romans



I love working with the Microsoft BI Stack. I am passionate about learning.

[A Speaker's Journey](#)

Thank you, Sponsors!



Join Our
Local User
Groups:



Shoulders of Giants



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Objectives

What is our mission



Our Journey



- 1. Power BI Data Model**
- 2. History**
- 3. External Tools**
- 4. More Tools**
- 5. Conclusion**

Our Journey



1. Power BI Data Model

2. History

3. External Tools

4. More Tools

5. Conclusion

Power BI Data Model

Our Journey



1. Power BI Data Model

2. History

3. External Tools

4. More Tools

5. Conclusion

History of Tools

Our Journey



1. Power BI Data Model
2. History
- 3. External Tools**
4. More Tools
5. Conclusion

External Tools

- SSMS and Azure Data Studio
- DAX Studio
- Tabular Editor
- PBI Explorer
- Bravo

Disclaimer



Power BI

Tabular Editor

Power BI



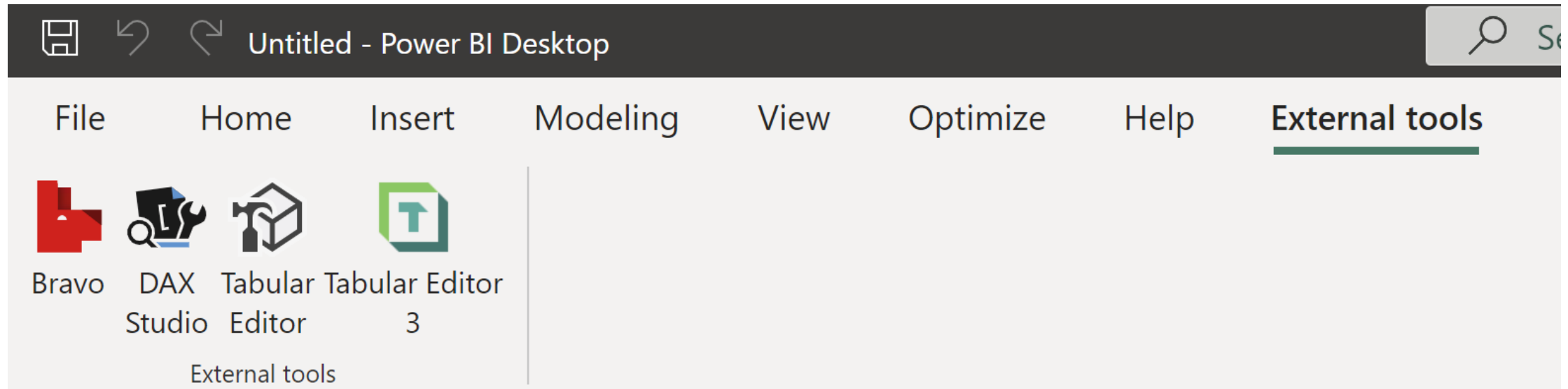
Who are you going to take on your Power BI Journey

- Each has a purpose
- A role to fill
- What is your mission
- Most of the tools are free

Installing External Tools

- Full install
- Added to the External Tools tab in Power BI
- Portable version

External Tools Tab



The background of the image is a deep blue night sky filled with numerous white stars of varying sizes and brightness. Some stars have a soft, glowing halo, while others are sharp points of light. The overall effect is a serene and cosmic atmosphere.

SQL Server Management Studio

Role

Dependable Astromech Droid

Does not have all the bells and whistles
but works

SSMS

- You may already have it installed
- May be on enterprise-approved list
- Some IntelliSense
- Power BI Premium Semantic Models

List everything in a table

Contoso_MAB* ✕

EVALUATE
Sales

175 %

Messages Results

Sales[CustomerKey]	Sales[Order Date]	Sales[StoreKey]	Sales[ProductKey]	Sales[Quantity]	Sales[Unit Price]
485447	1/4/2018 12:00...	999999	781	1	41.25
1075463	1/4/2018 12:00...	999999	1649	1	155.994
1292212	1/6/2018 12:00...	999999	1057	1	940.8
1838798	1/10/2018 12:0...	999999	1581	1	131.4
1838798	1/10/2018 12:0...	999999	1275	1	83.408
1838798	1/10/2018 12:0...	999999	1307	1	108.8
151714	1/17/2018 12:0...	999999	163	1	1273.76
77409	1/24/2018 12:0...	999999	1755	1	45.43
747435	2/16/2018 12:0...	999999	180	1	55.2
199232	2/23/2018 12:0...	999999	1069	1	940.8
1986921	2/28/2018 12:0...	999999	452	1	549.875
1128188	3/10/2018 12:0...	999999	2167	1	122.25

COUNTROWS

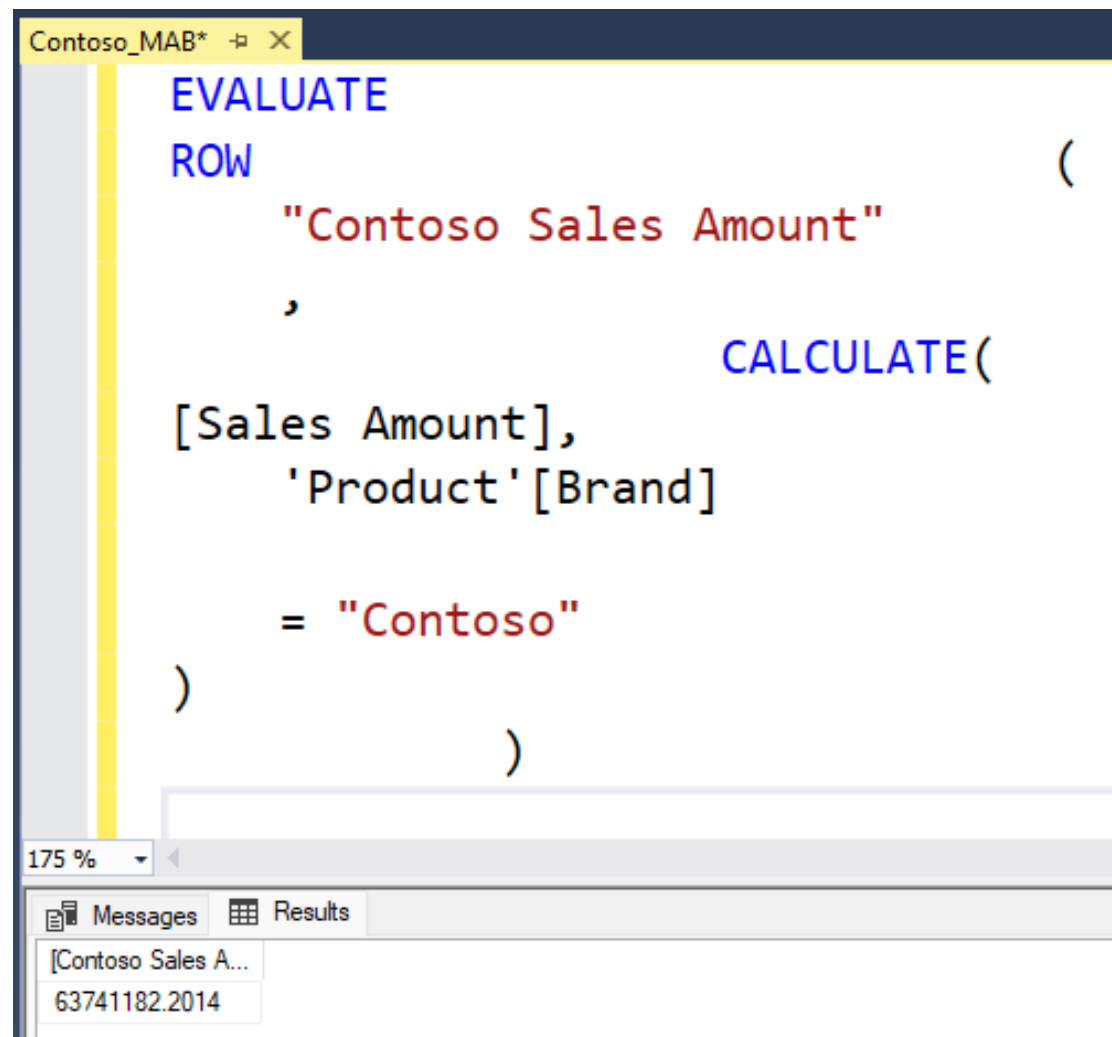
The screenshot shows a SQL query editor window titled "Contoso_MAB*" with a yellow border. The editor contains a DAX query using the `EVALUATE` function to calculate the number of rows in the `Sales` table. The query is as follows:

```
EVALUATE
{
    "Number of Rows",
    COUNTROWS(Sales)
}
```

Below the query editor, there is a results pane with a zoom level of 175%. It features two tabs: "Messages" and "Results". The "Results" tab is active, displaying a table with the following data:

[Value]
Number of Rows
1227

DAX Formatting



```
Contoso_MAB*  [X]
EVALUATE
ROW
    "Contoso Sales Amount"
    ,
    CALCULATE(
        [Sales Amount],
        'Product'[Brand]
        = "Contoso"
    )
)
```

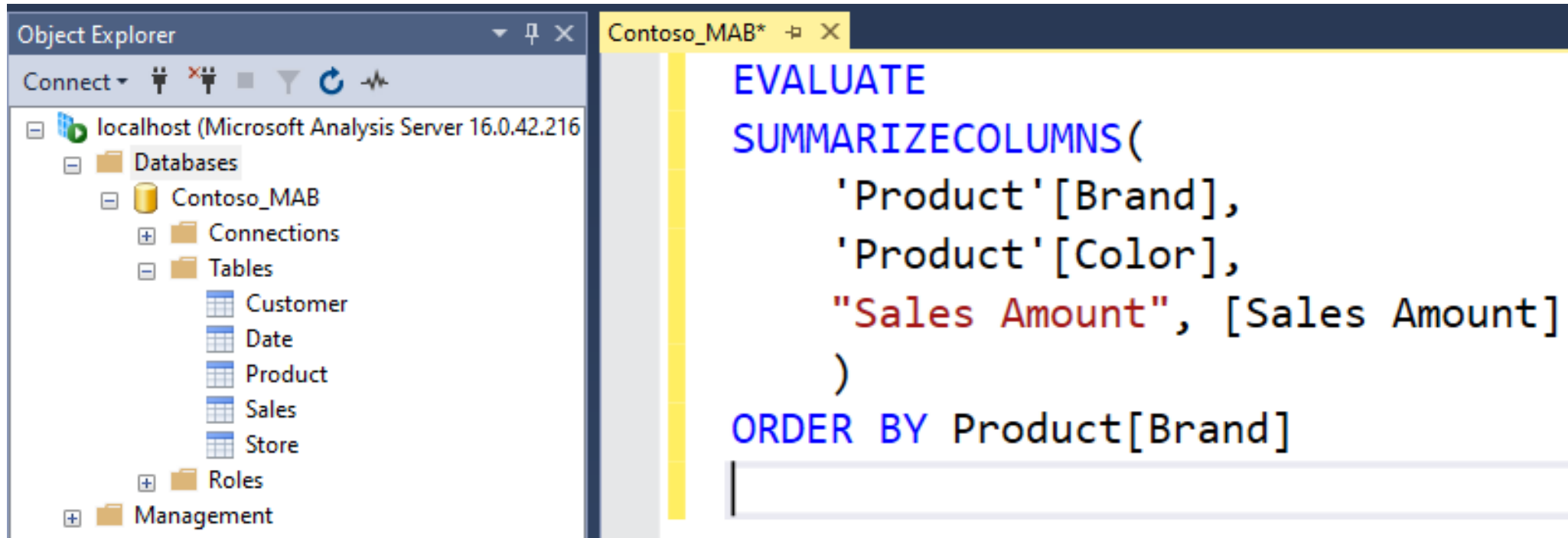
175 %

Messages Results

[Contoso Sales A...

63741182.2014

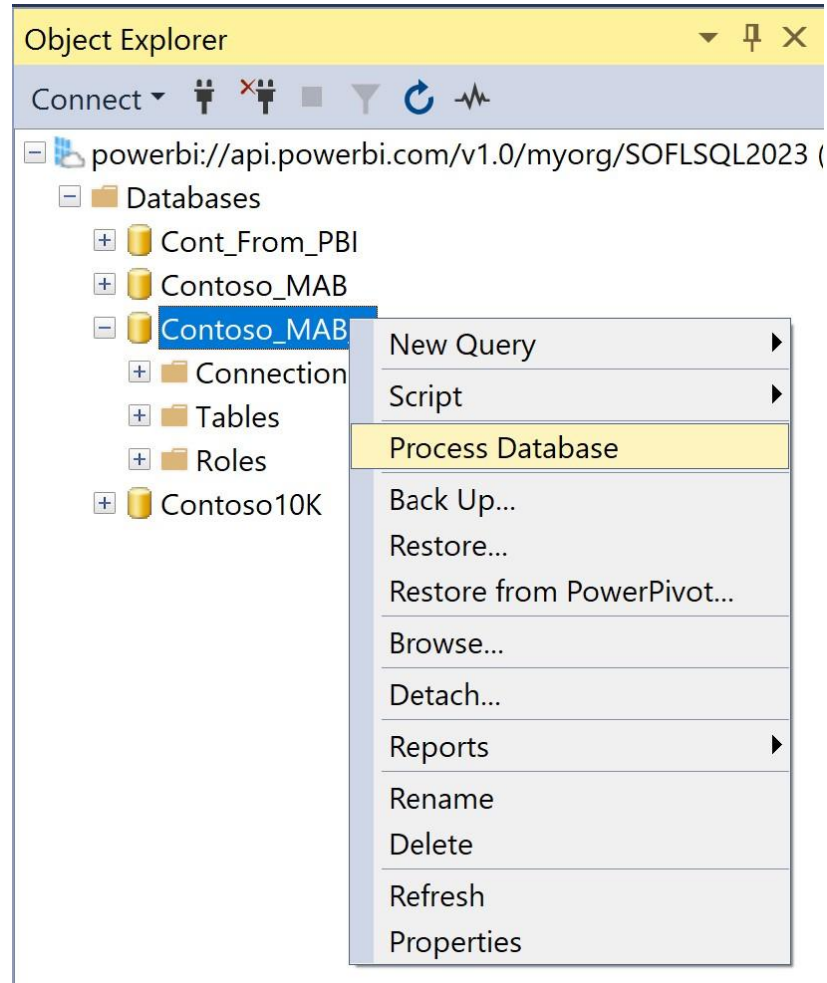
Column Names – What Column Names?



The screenshot displays the SQL Server Enterprise Manager interface. On the left, the 'Object Explorer' pane shows the hierarchy: 'localhost (Microsoft Analysis Server 16.0.42.216)' > 'Databases' > 'Contoso_MAB' > 'Tables'. The tables listed under 'Contoso_MAB' are Customer, Date, Product, Sales, and Store. Below the tables are 'Roles' and 'Management' folders. On the right, a query window titled 'Contoso_MAB*' contains the following SQL query:

```
EVALUATE  
SUMMARIZECOLUMNS(  
    'Product'[Brand],  
    'Product'[Color],  
    "Sales Amount", [Sales Amount]  
)  
ORDER BY Product[Brand]
```

Admin Tasks – Process Database (Model)

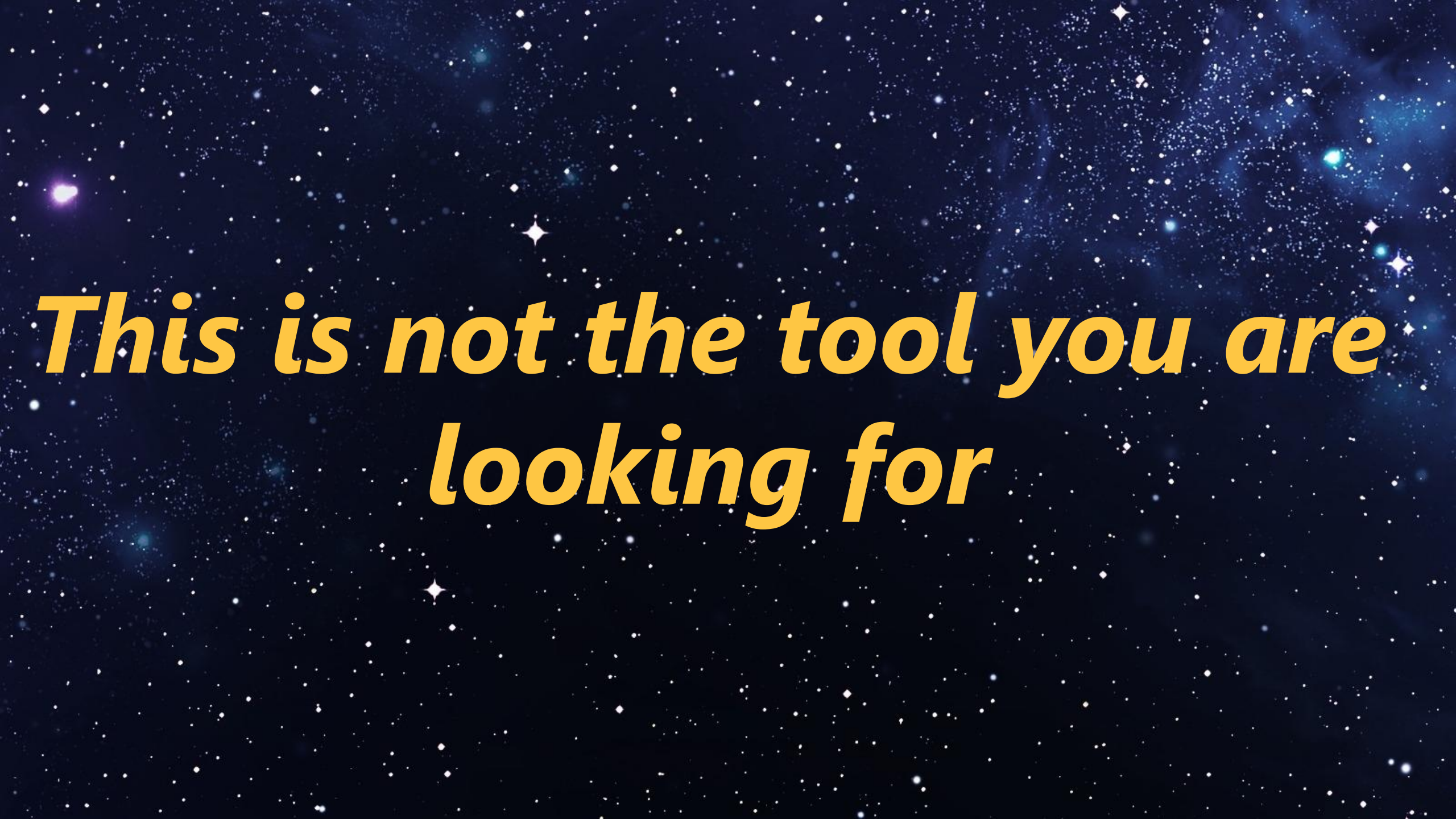


SSMS

- Can't connect to Power BI Desktop
- Missing functions in IntelliSense
- No DAX Formatting
- Great for a DBA

The background of the image is a deep blue, starry night sky. It is filled with numerous small, white stars of varying brightness. There are also some larger, more prominent stars with distinct four-pointed diffraction patterns. A few stars have a slight blue or purple tint. The overall effect is a sense of vastness and cosmic wonder.

Azure Data Studio



***This is not the tool you are
looking for***

Who are you going to take on your Journey





DAX Studio

Role

Inquisitor – Analyst

Seeks ways to extract data from sources
around them

Certification DP-600

Exam DP-600: Implementing Analytics Solutions Using Microsoft Fabric

Design and build semantic models

- Identify use cases for DAX Studio and Tabular Editor 2















Optimize enterprise-scale semantic models

- Improve DAX performance by using DAX Studio

DAX Studio

- IntelliSense
- Links to DAX Guide
- DAX Formatter
- Performance Tuning

Hidden Date Tables

- >  Customer
- >  Date
- ✓  *DateTableTemplate_a987aaf9-4324-4fff-9e6b-91eb917a6145*
 -  *Date*
 - >  Date Hierarchy
 - 1²₃ Day*
 - A^B_C Month*
 - 1²₃ MonthNo*
 - A^B_C Quarter*
 - 1²₃ QuarterNo*
 - 1²₃ Year*
- >  *LocalDateTable_329979ec-f948-448d-8d40-da32309c689b*
- >  *LocalDateTable_565d20a7-37da-41eb-acea-3d1681afac62*
- >  *LocalDateTable_6082b466-aa3a-416d-92f5-dee233105c41*
- >  *LocalDateTable_729c8b24-1385-4545-897f-e90fb9602a1d*
- >  *LocalDateTable_86220e95-4654-4888-819a-8afd2ddbe1da*
- >  *LocalDateTable_8ce283be-c847-412c-907b-87781a0d19e1*
- >  Product
- >  Sales
- >  Store

Auto Date Time

Options

GLOBAL

Data Load

Power Query Editor

DirectQuery

R scripting

Python scripting

Security

Privacy

Regional Settings

Updates

Usage Data

Diagnostics

Preview features

Auto recovery

Report settings

CURRENT FILE

Data Load

Regional Settings

Privacy

Auto recovery

Published dataset settings

Query reduction

Report settings

Background Data

☐ Always allow data previews to download in the background

☒ Allow data previews to download in the background according to each file's setting

☐ Never allow data previews to download in the background

Parallel loading of tables

When you load data into Power BI (via import or DirectQuery), each data table is backed by a Power Query query. These queries are evaluated simultaneously instead of one-by-one, which can speed up the process. In certain situations, you might want to adjust the default number of simultaneous query evaluations and memory used. [Learn more](#)

Maximum number of simultaneous evaluations

20

Maximum memory used per simultaneous evaluation (MB)

432

Time intelligence

☐ Auto date/time for new files [Learn more](#)

Data Cache Management Options

Currently used: 655 KB

Clear Cache

Maximum allowed (MB):

4096

Restore Defaults

Q&A Cache Options

Currently used: 1.43 MB

Clear Cache

Maximum allowed (MB):

4096

OK

Cancel

XMLA Endpoint – Permissions

Admin portal

Tenant settings

Usage metrics

Users

Premium Per User

Audit logs

Capacity settings

Refresh summary

Embed Codes

Organizational visuals

Azure connections

Workspaces

Custom branding

Protection metrics

Featured content

Premium Per User

⌵ Auto Refresh

Automatic page refresh

☒ On

Minimum refresh interval

5 Minutes ▾

Change detection measure

☒ On

Minimum execution interval

30 Seconds ▾

⌵ Dataset workload settings

XMLA Endpoint

Read Write ▾

Apply

Discard

XMLA Endpoint

Workspace settings

General

License info

Azure connections

System storage

Git integration

OneLake

Workspace identity

Network security

Power BI

License info

Choose a license for this workspace.

License Configuration

Edit

Current license

Premium per-user

License capacity

Premium Per User - Reserved

SKU: PP3, Region: West US 2

Semantic model storage format

Small semantic model storage format

Connection link

Use this link to connect third-party software to the workspace. Copy the link and add it to your third-party software.

<powerbi://api.powerbi.com/v1.0/myorg/PremTest>



Warning: There may be multiple ways to get the endpoint/link

DAX Studio Demo

DAX Query View

DAX Query View

File Home Help External tools

Paste Cut Copy

Format Comment Uncomment Find Replace Command palette

Clipboard Editing

Run

```
1 // Learn more about DAX queries at https://aka.ms/dax-queries
2
3 // Here is a sample DAX query from your model, click 'Run'
4 // Try other DAX queries by right clicking a table, column, or measure in the data pane and choosing one from 'Quick queries'
5 EVALUATE
6 | TOPN(100, 'Sales')
7
```

Results Result 1 of 1 Copy

	Sales[Order Date]	Sales[Delivery Date]	Sales[CustomerKey]	Sales[StoreKey]	Sales[ProductKey]	Sales[Quant]
1	2/22/2020 12:00:00 AM	2/25/2020 12:00:00 AM	1891277	999999	1730	
2	2/26/2020 12:00:00 AM	2/28/2020 12:00:00 AM	1440579	999999	1455	
3	2/26/2020 12:00:00 AM	2/28/2020 12:00:00 AM	1440579	999999	670	
4	2/26/2020 12:00:00 AM	2/29/2020 12:00:00 AM	1463606	999999	1549	
5	2/27/2020 12:00:00 AM	3/2/2020 12:00:00 AM	2059682	999999	550	
6	2/27/2020 12:00:00 AM	3/2/2020 12:00:00 AM	1683913	999999	1639	

DAX Query View

- **No need for IT to install**
- **Copy from Performance Analyzer**
- **Queries saved with Power BI file**
- **Validate data**

DAX Query View Demo



Tabular Editor

Role

The engineer
The builder or tinkerer

Certification DP-600

Exam DP-600: Implementing Analytics Solutions Using Microsoft Fabric

Design and build semantic models

- Identify use cases for DAX Studio and Tabular Editor 2

Optimize enterprise-scale semantic models

- Optimize a semantic model by using Tabular Editor 2

Tabular Editor

- Version 2.x is the free version
- Create and edit measures
- Create Calculation Groups
(This was the Only way!)

Tabular Editor

- C# scripting and automation
- Command line integration
- Source Control
 - Save to Folder
- Best Practice Analyzer

Tabular Editor Demo

PBI Explorer

Role









Navigator

Able to explore the galaxy and see changes
in geography







PBIP Format

- Power BI Desktop projects (PBIP) (Preview):
 - <https://learn.microsoft.com/en-us/power-bi/developer/projects/projects-overview>
- Compare projects using git in VS Code

PBIP Folder













Name	Status	Date modified	Type	Size
 .vscode		10/17/2023 2:40 PM	File folder	
 Contoso10K_PBIP		10/17/2023 11:39 PM	File folder	
 .gitignore		10/17/2023 2:42 PM	Git Ignore Source File	1 KB
 README		10/17/2023 2:39 PM	Markdown Source File	1 KB

Dataset, Report, and Desktop File













Name	Status	Date modified	Type	Size
 Contoso10K_PBIP.Dataset		10/17/2023 11:39 PM	File folder	
 Contoso10K_PBIP.Report		10/17/2023 11:39 PM	File folder	
 Contoso10K_PBIP		10/17/2023 11:39 PM	Microsoft Power BI Des...	1 KB



PBIP Dataset

Name	Status	Date modified	Type	Size
 .pbi		10/17/2023 11:39 PM	File folder	
 definition.pbidataset		10/17/2023 11:39 PM	PBIDATASET File	1 KB
 diagramLayout		10/17/2023 11:39 PM	JSON Source File	3 KB
 item.config		10/17/2023 11:39 PM	JSON Source File	1 KB
 item.metadata		10/17/2023 11:39 PM	JSON Source File	1 KB
 model.bim		10/17/2023 11:39 PM	BIM File	85 KB

PBIP Report

Name	Status	Date modified	Type	Size
 .pbi		10/17/2023 11:39 PM	File folder	
 StaticResources		10/17/2023 11:39 PM	File folder	
 definition		10/17/2023 11:39 PM	Microsoft Power BI Des...	1 KB
 item.config		10/17/2023 11:39 PM	JSON Source File	1 KB
 item.metadata		10/17/2023 11:39 PM	JSON Source File	1 KB
 report		10/17/2023 11:39 PM	JSON Source File	3 KB

Visual Studio Code – Report Differences

report.json (Working Tree) M X

Contoso10K_PBIP > Contoso10K_PBIP.Report > report.json > [] sections > [] 0 > [] visualContainers > [] 0

```
1 {
2   "config": "{\version\": \"5.47\", \"themeCollection\": {\baseTheme\": {\name\": \"CY23SU08\", \"version\": \"5.48\", \"type\": 2}}, \"activeSe
3   \"layoutOptimization\": 0,
4   \"resourcePackages\": [
5     {
6       \"resourcePackage\": {
7         \"disabled\": false,
8         \"items\": [
9           {
10            \"name\": \"CY23SU08\",
11            \"path\": \"BaseThemes/CY23SU08.json\",
12            \"type\": 202
13          }
14        ],
15        \"name\": \"SharedResources\",
16        \"type\": 2
17      }
18    ]
19  },
20  \"sections\": [
21    {
22      \"config\": \"{\",
23      \"displayName\": \"Page 1\",
24      \"displayOption\": 1,
25      \"filters\": \"[]\",
26      \"height\": 720.00,
27      \"name\": \"ReportSection\",
28      \"visualContainers\": [
29        {
30          \"config\": \"{\\name\\\": \"25225282f0042ce9cb94\", \"layouts\\\": [{\\id\\\": 0, \"position\\\": {\\x\\\": 0, \"y\\\": 0, \"z\\\": 0, \"width\\\": 629.862033
31          \"filters\": \"[]\",
32          \"height\": 405.52,
33          \"width\": 629.86,
34          \"x\": 0.00,
35          \"y\": 0.00,
36          \"z\": 0.00
37        }
38      ],
39      \"width\": 1280.00
40    }
41  ]
42 }
```

```
1 {
2   \"config\": \"{\\version\\\": \"5.47\", \"themeCollection\\\": {\baseTheme\\\": {\name\\\": \"CY23SU08\", \"version\\\": \"5.48\", \"type\\\": 2}}, \"activeSe
3   \"layoutOptimization\": 0,
4   \"resourcePackages\": [
5     {
6       \"resourcePackage\": {
7         \"disabled\": false,
8         \"items\": [
9           {
10            \"name\": \"CY23SU08\",
11            \"path\": \"BaseThemes/CY23SU08.json\",
12            \"type\": 202
13          }
14        ],
15        \"name\": \"SharedResources\",
16        \"type\": 2
17      }
18    ]
19  },
20  \"sections\": [
21    {
22      \"config\": \"{\",
23      \"displayName\": \"Page 1\",
24      \"displayOption\": 1,
25      \"filters\": \"[]\",
26      \"height\": 720.00,
27      \"name\": \"ReportSection\",
28      \"visualContainers\": [
29        {
30          \"config\": \"{\\name\\\": \"25225282f0042ce9cb94\", \"layouts\\\": [{\\id\\\": 0, \"position\\\": {\\x\\\": 111.84466019417476, \"y\\\": 56.2493612672
31          \"filters\": \"[]\",
32          \"height\": 405.52,
33          \"width\": 629.86,
34          \"x\": 111.84,
35          \"y\": 56.25,
36          \"z\": 0.00
37        }
38      ],
39      \"width\": 1280.00
40    }
41  ]
42 }
```

PBI Explorer – Report Differences

The screenshot displays the PBI Explorer interface with two side-by-side panes comparing the 'Contoso.pbix' report (left) and its copy (right). Both panes show a 3D pie chart visual. The 'Refine comparison' dropdown is set to 'Show modified'. The left pane highlights differences in the 'Net Price' visual's dimensions (X, Y, Height, Width) in red, while the right pane highlights differences in the same visual's dimensions in green.

Left Pane (Contoso.pbix):

Object / Property	Value
Pages	
Net Price	
Visuals	
5945da4a49ae9c90e0c0	
X	10.5263157894737
Y	0
Height	720
Width	1269.47368421053

Right Pane (Contoso - Copy.pbix):

Object / Property	Value
Pages	
Net Price	
Visuals	
5945da4a49ae9c90e0c0	
X	0
Y	35.8988422555519
Height	684.394057194555
Width	1279.620022335

PBI Explorer Demo



Bravo

Role

Jack of all trades

Fills in skills other roles may be missing

Bravo

- Optimize Data Model
 - Unused columns
 - Size and Cardinality
- Add custom date tables
- Exporting Data
- Fills in the gap between Power BI functionality

Bravo Demo

Our Journey

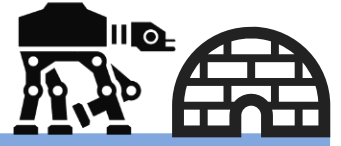


1. Power BI Data Model
2. History
3. External Tools
- 4. More Tools**
5. Conclusion

More Tools

- **ALM Toolkit**
 - Schema Compare
- **Metadata Translator**
 - Streamline localization
- **PowerBI.tips Business Ops**
 - Easy deployment tool - adding external tools

Our Journey



1. Power BI Data Model
2. History
3. External Tools
4. More Tools
- 5. Conclusion**



Conclusion



Better Together

©Disney

Conclusion

- Power BI does not have to be a solo journey
- You can become more efficient
- Increase your value as a developer
- More tools to fit your use case

Resources

- SQLBI Tools:
 - <https://www.sqlbi.com/tools/>
- DAX Studio
 - <https://daxstudio.org/>
- Tabular Editor
 - <https://github.com/TabularEditor/TabularEditor>

More Resources

- PBI Explorer:

- <https://www.pbiexplorer.com/>

- Bravo:

- <https://www.sqlbi.com/tools/bravo-for-power-bi/>

Tabular Editor Scripts:

- <https://github.com/PowerBI-tips/TabularEditor-Scripts>

More Resources

- Elegant BI
 - <https://www.elegantbi.com/>
- Model Auto Build
 - <https://github.com/m-kovalsky/ModelAutoBuild>
- Certification DP-600
 - <https://learn.microsoft.com/en-us/credentials/certifications/resources/study-guides/dp-600>



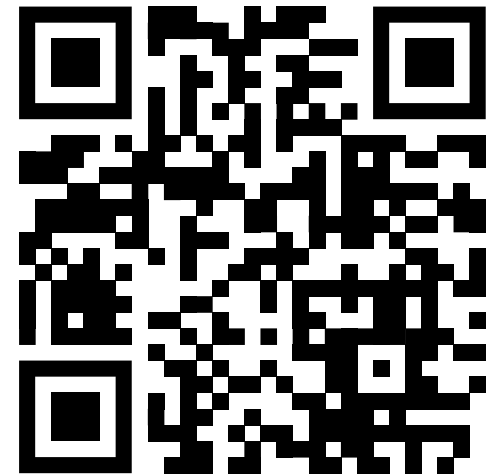
SQLSATURDAY

OCT, 19TH 2024

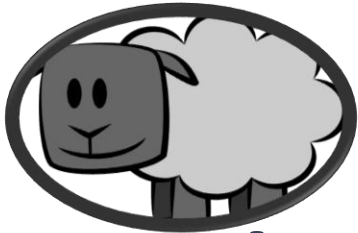
Orlando, FL



Scan the QR code
to fill out session
evaluations



Thank you



The Dax Shepherd

Jason Romans

thedaxshepherd@gmail.com

www.thedaxshepherd.com

