POWER BI: INTRODUCTION TO DAX

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INSTRUCTOR

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Table of Contents

TERMINOLOGY

Data Analysis Expressions (DAX) is a formula language used in Microsoft Power BI to perform calculations and create custom measures, columns, and tables.

DAX allows you to manipulate data within Power BI to generate valuable insights and reports.

Some Key Concepts

1. Measures Quick and Custom:
Measures are calculations that aggregate data in a virtual table.

2. Calculated Columns:
Calculated columns are another way to extend the data model.

3. Time Intelligence:
DAX includes powerful time intelligence functions, allowing you to perform dates and time period calculations.

DAX and Excel

Excel: work on cells

```
= (A1*A2)-B2
```

DAX: works only on tables

```
Count of Incidents = COUNT(Crimes[RN Number])
```

Count of Incidents - a name for a measure or calculation

Crimes – table name (if a name has two and more words with space, use parenthesis, 'Crime incidents')

[RN Number] – column name

DAX and Excel Similarity

Excel:

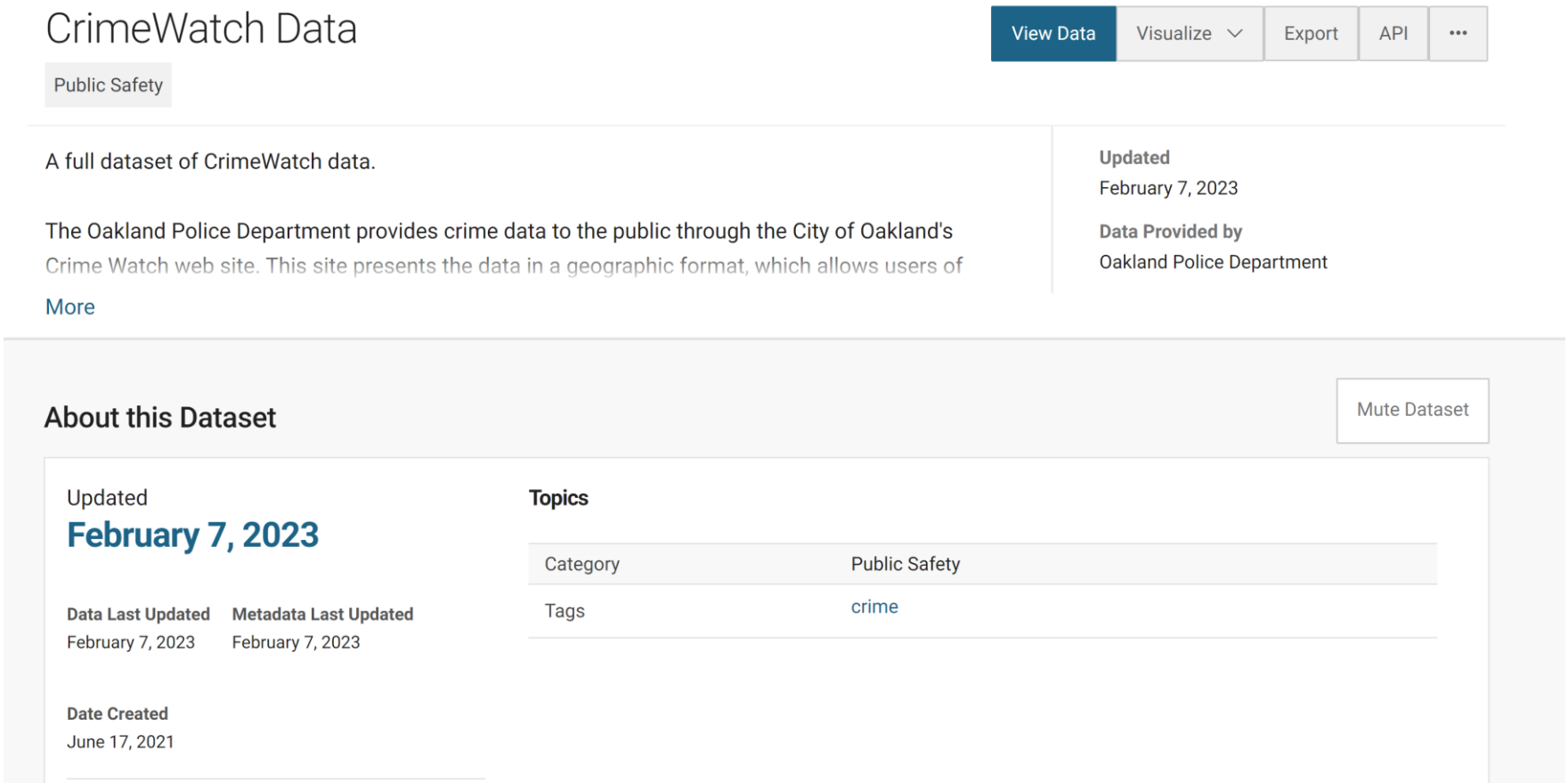
```
= IF([@[Event Time] > 19, “Night”, “Day”)
```

DAX:

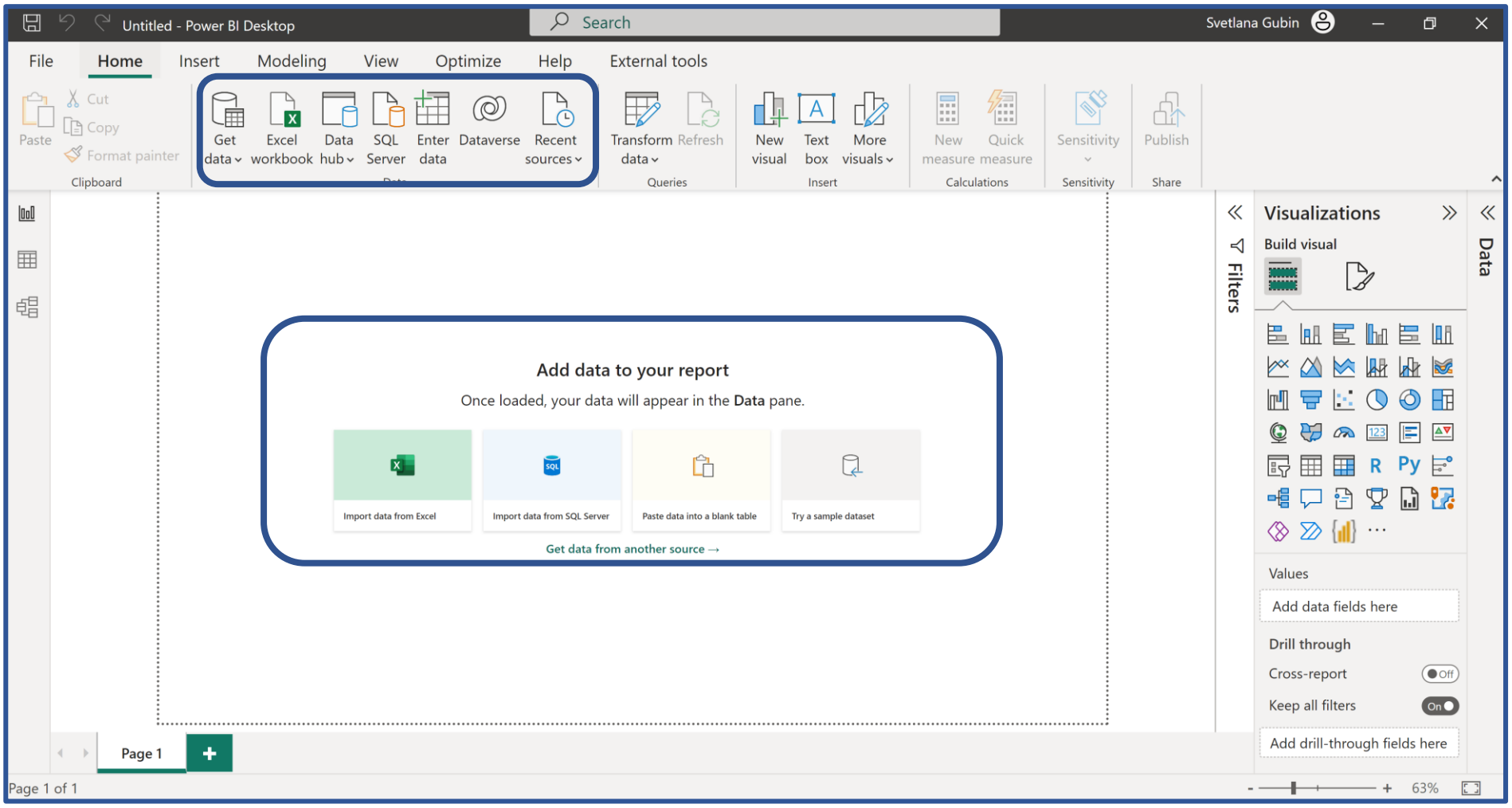
```
Evening Incidents = IF(Crimes[Event Time] > 19, “Night”, “Day”)
```

Power BI – Data Set

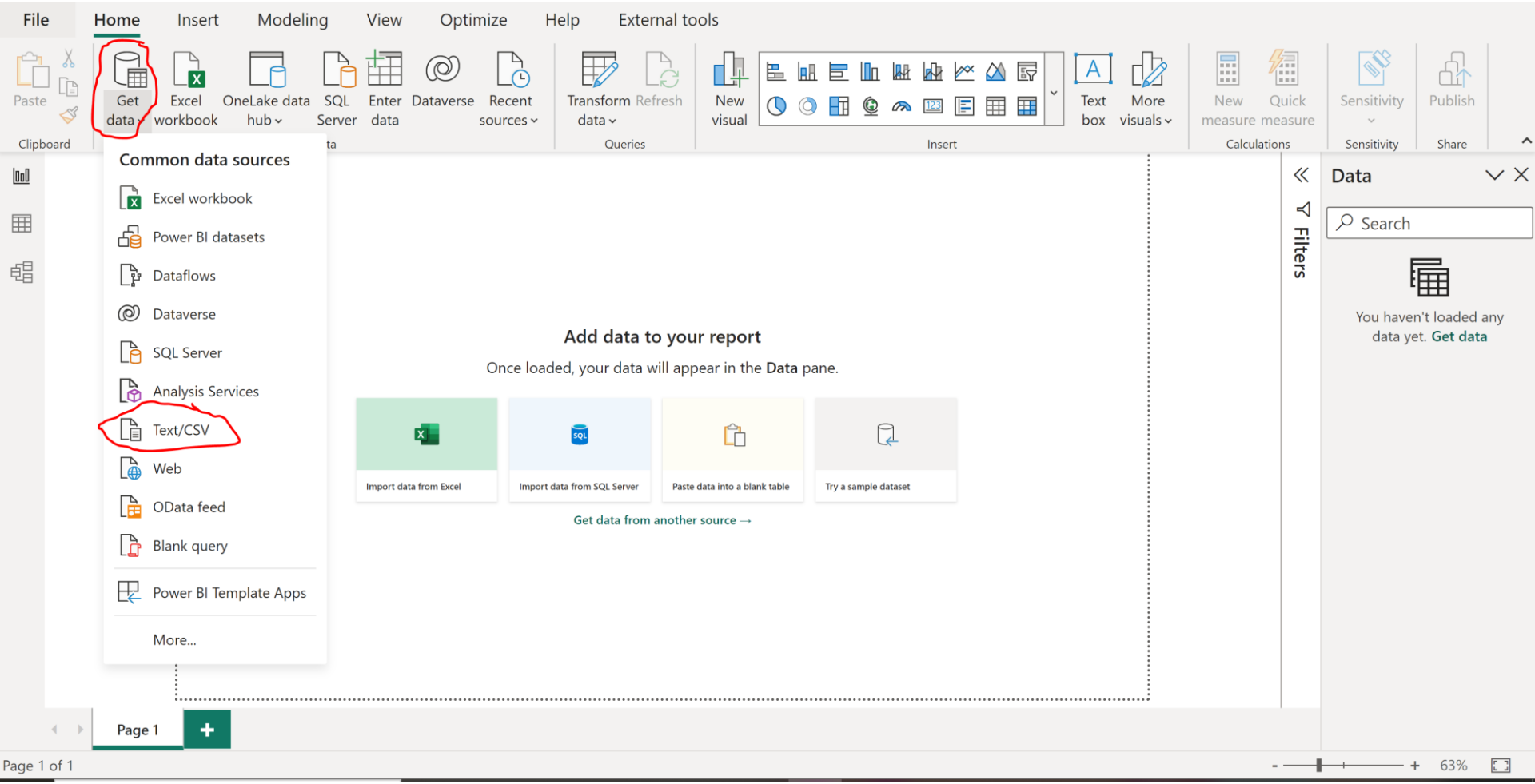
Source: https://data.oaklandca.gov/PublicSafety/CrimeWatch-Data/ppgh-7dqv



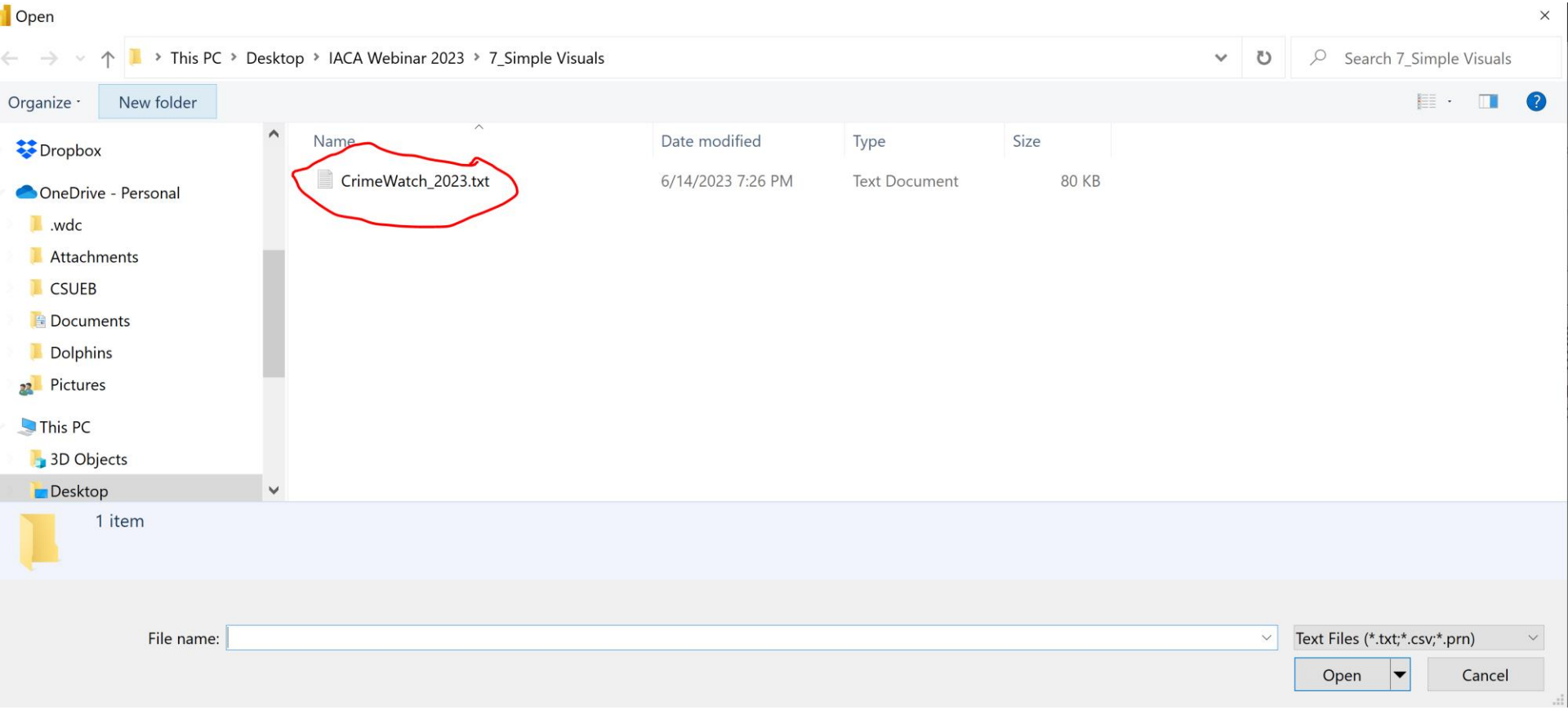
Power BI – Get Data



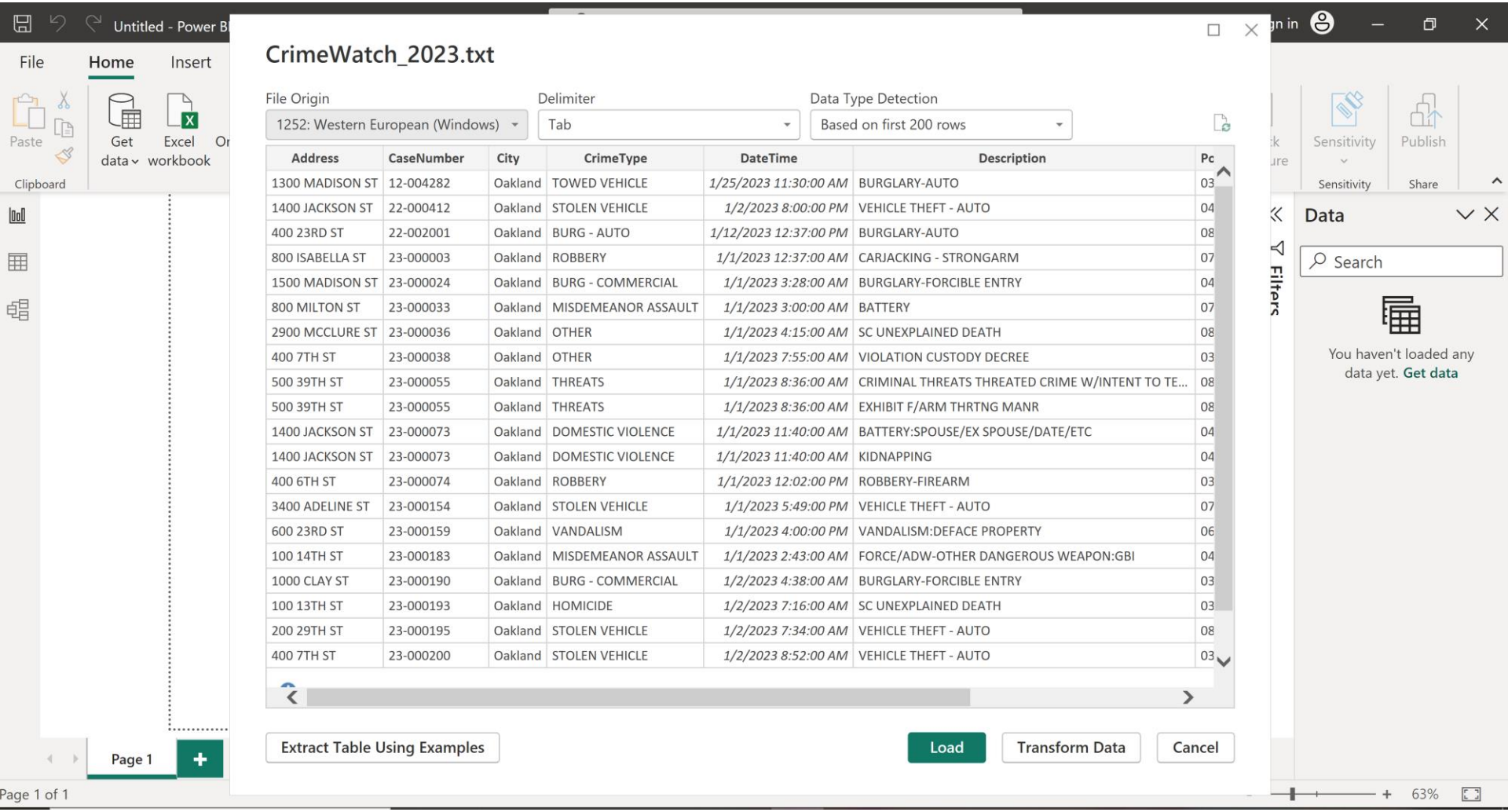
Power BI – Text/CSV



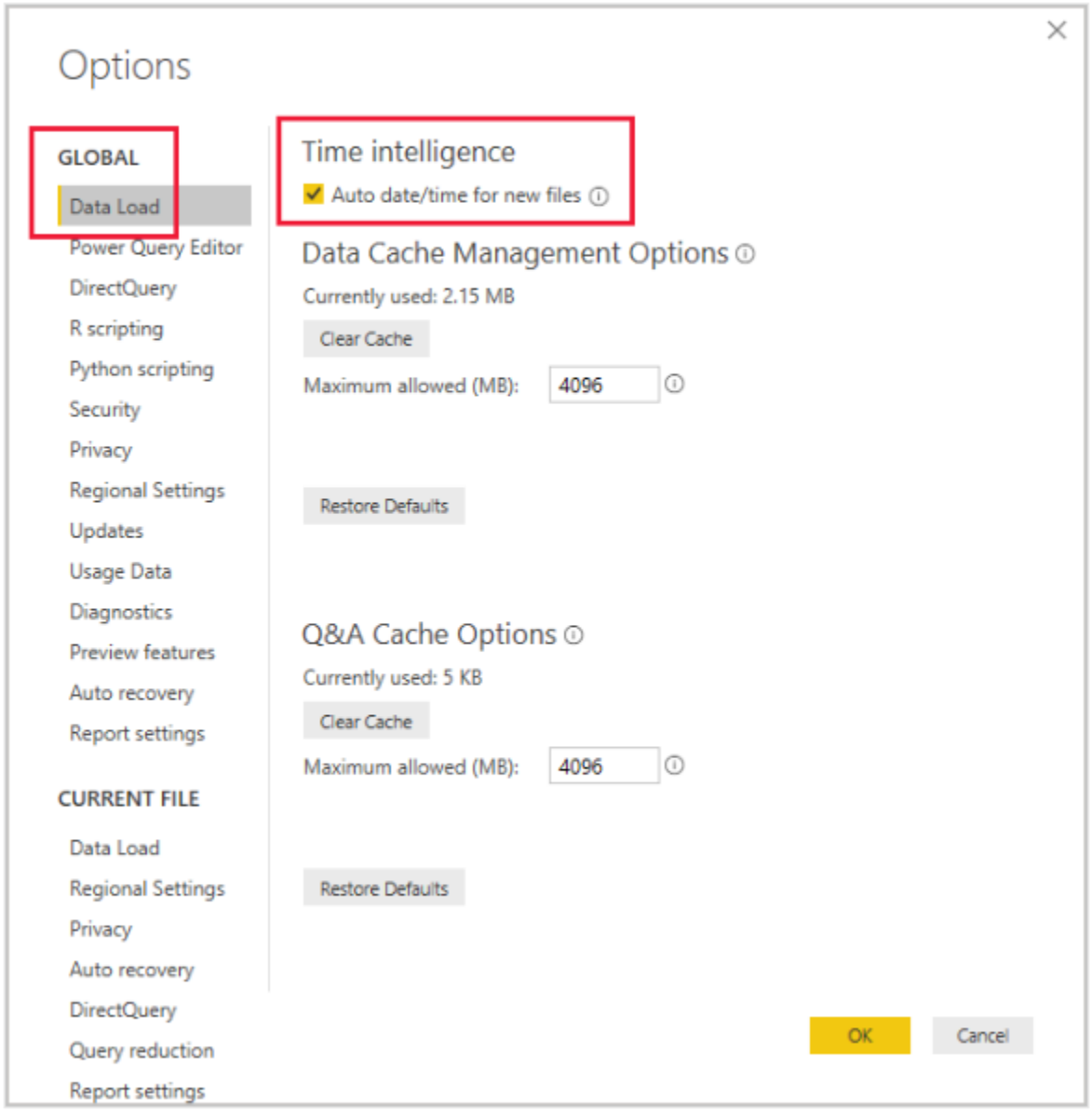
POWER BI – DATA



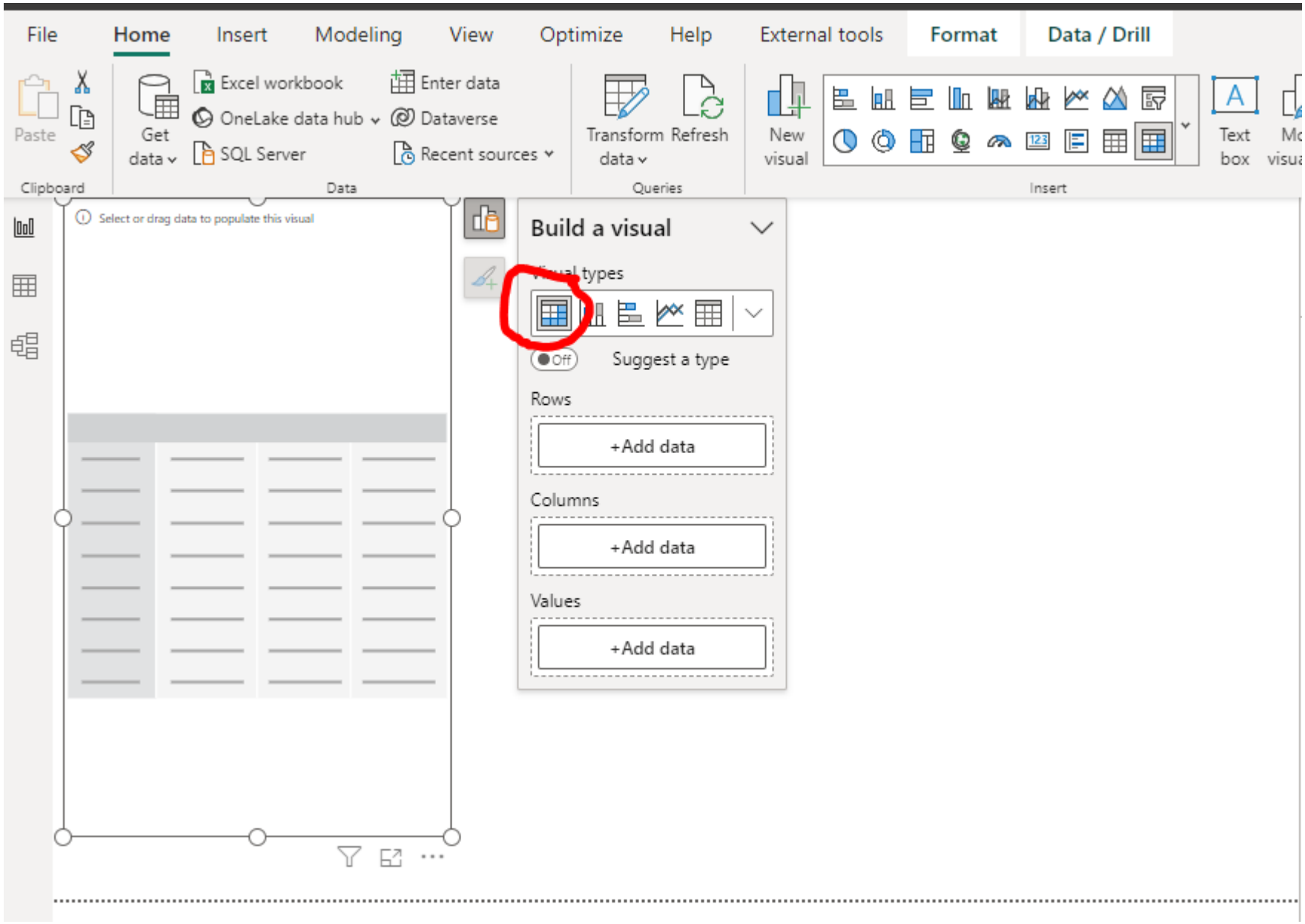
POWER BI – LOAD DATA



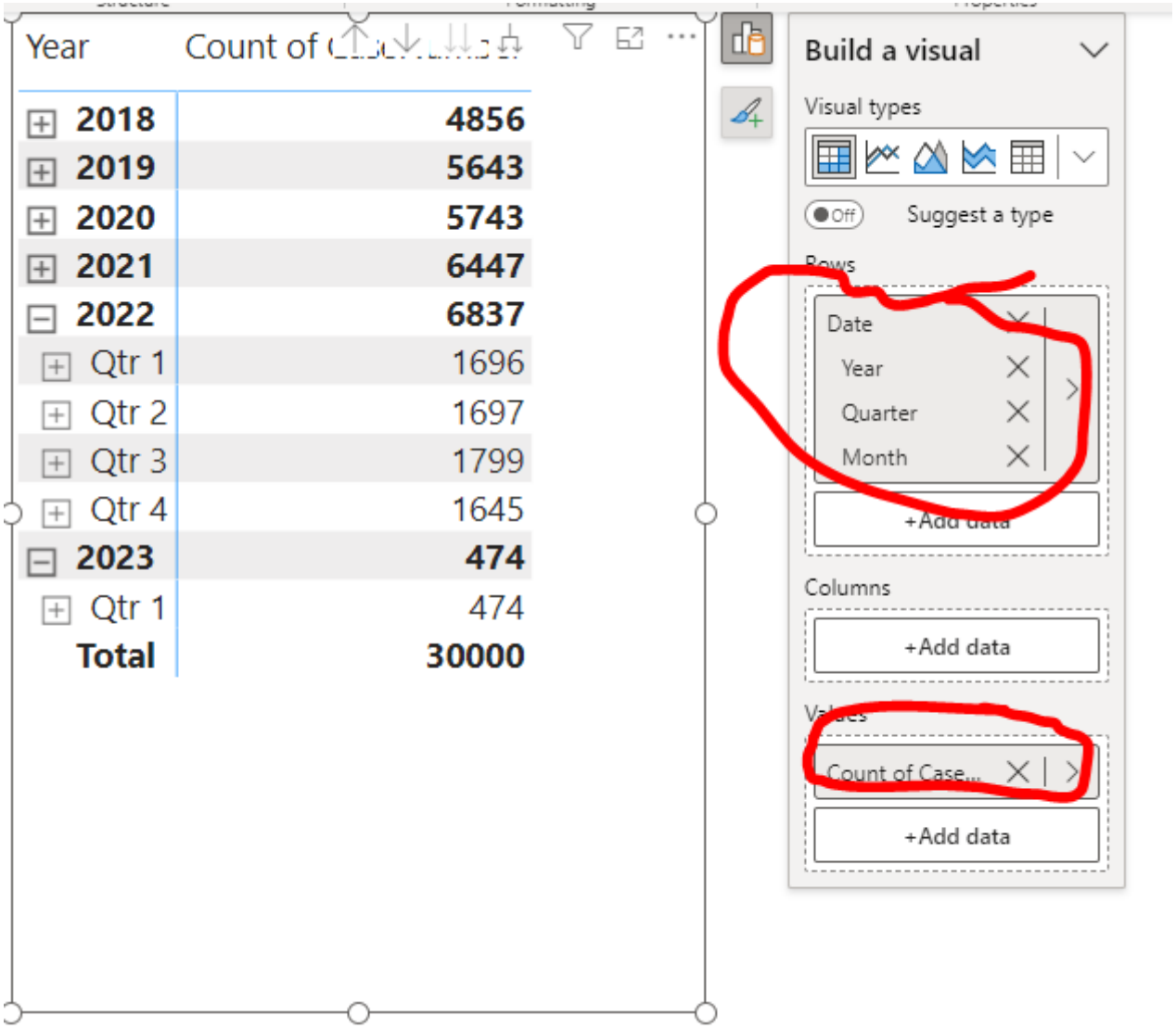
Time Intelligence Options



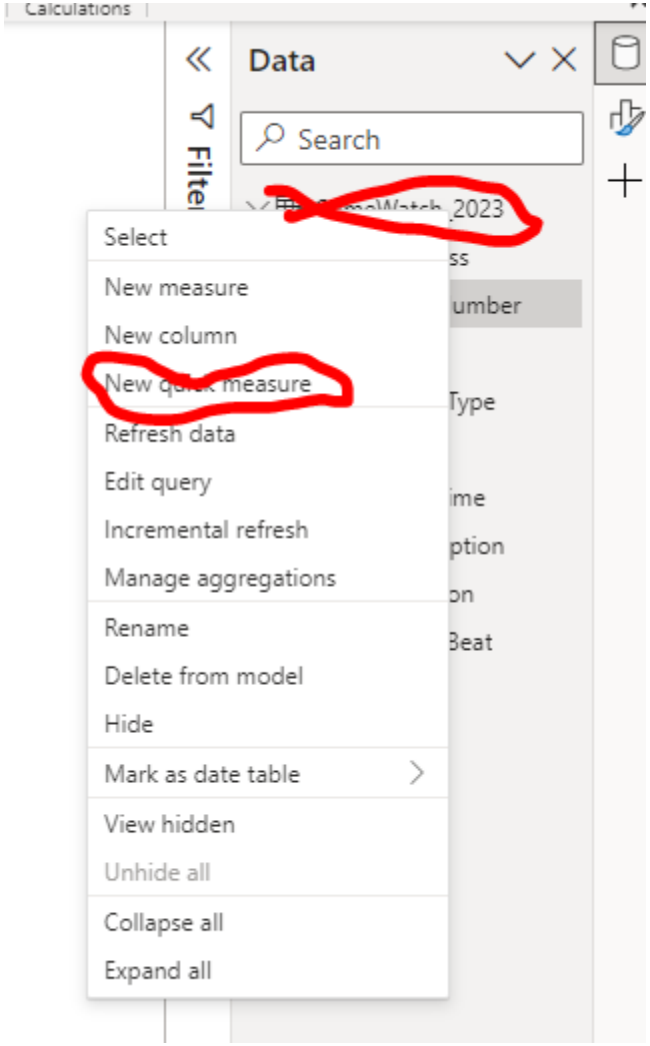
QUICK MEASURE



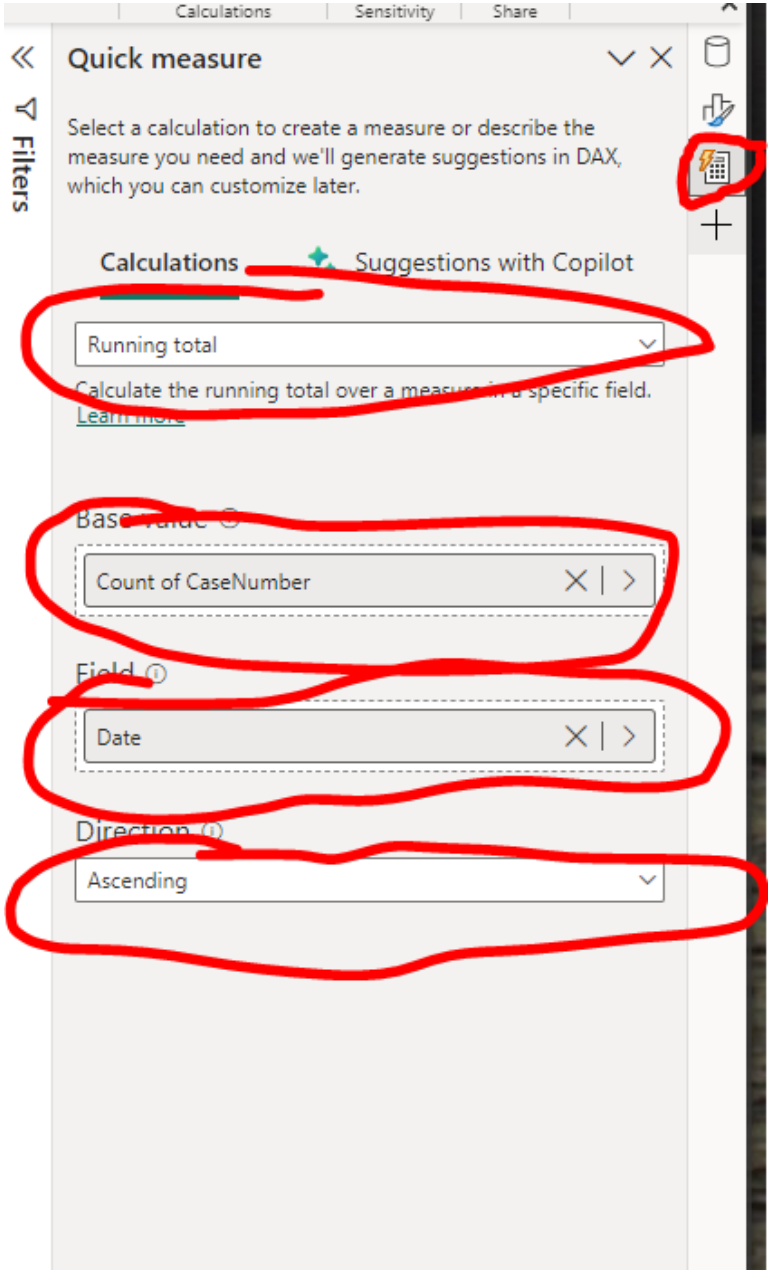
QUICK MEASURE

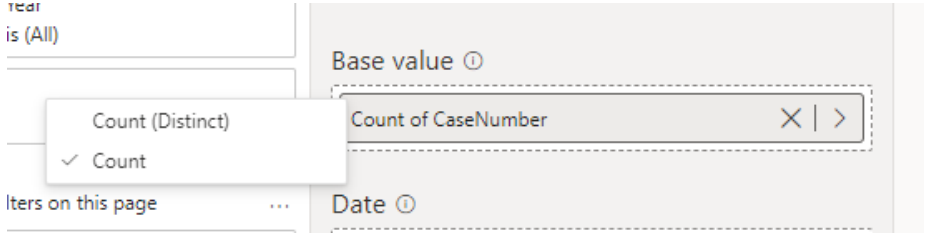


QUICK MEASURE

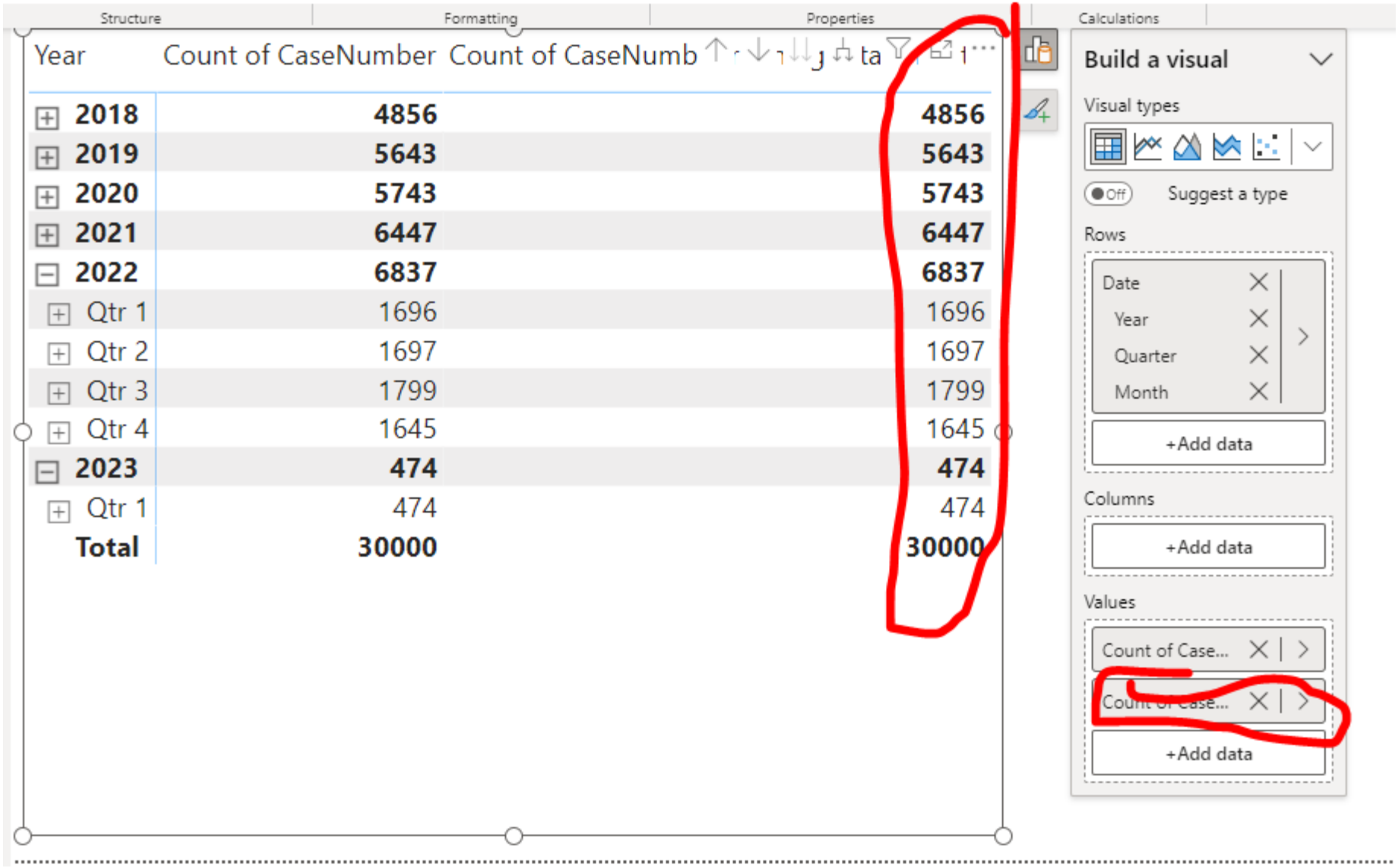


Quick Measure





QUICK MEASURE

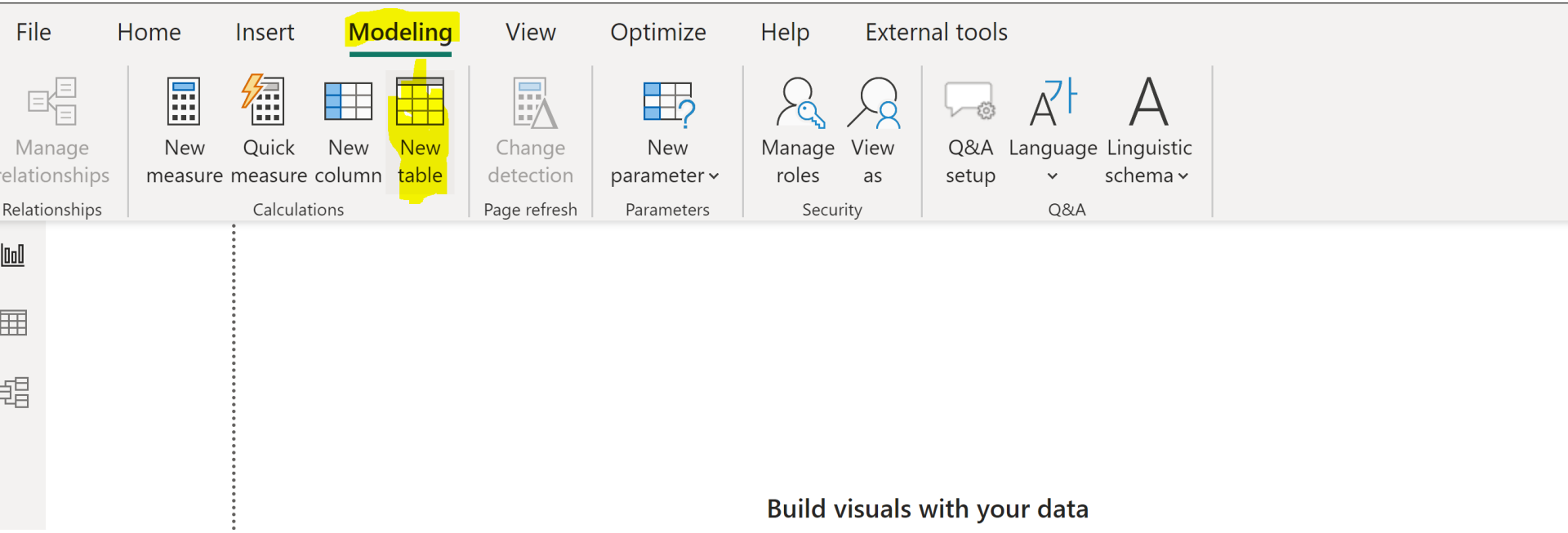


Quick Measure

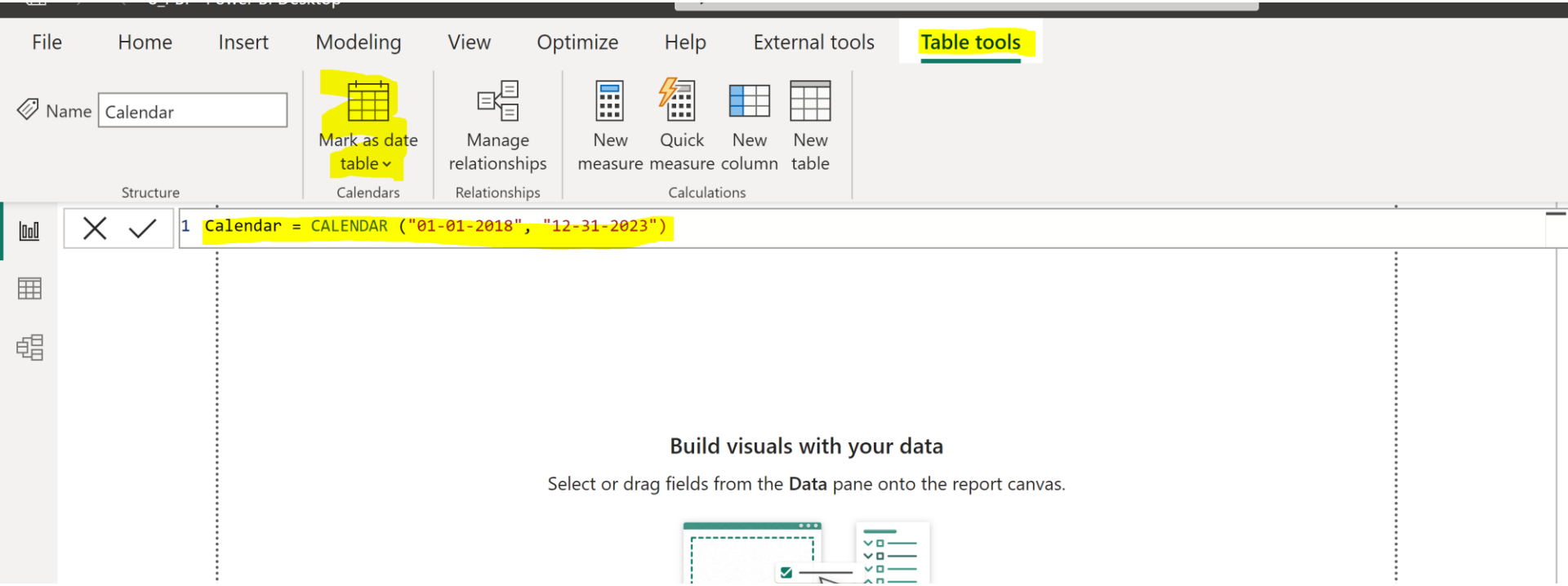
```
Count of CaseNumber running total in Date =
CALCULATE(
    COUNTA('CrimeWatch_2023'[CaseNumber]),
    FILTER(
        ALLSELECTED('CrimeWatch_2023'[Date]),
        ISONORAFTER('CrimeWatch_2023'[Date], MAX('CrimeWatch_2023'[Date]), DESC)
    )
)
```

New Table

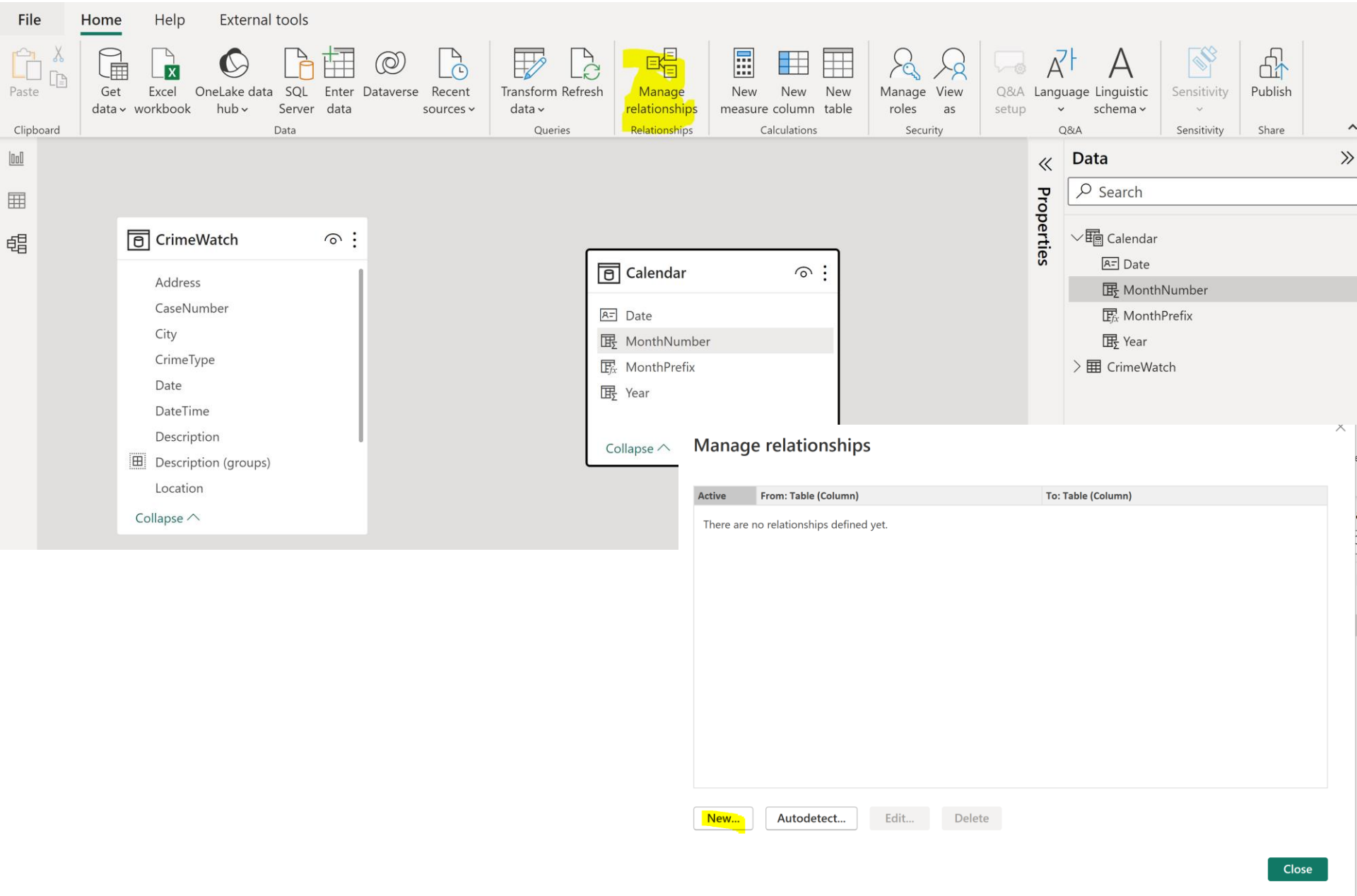
```
Calendar = CALENDAR ("01-01-2018", "12-31-2023")
```



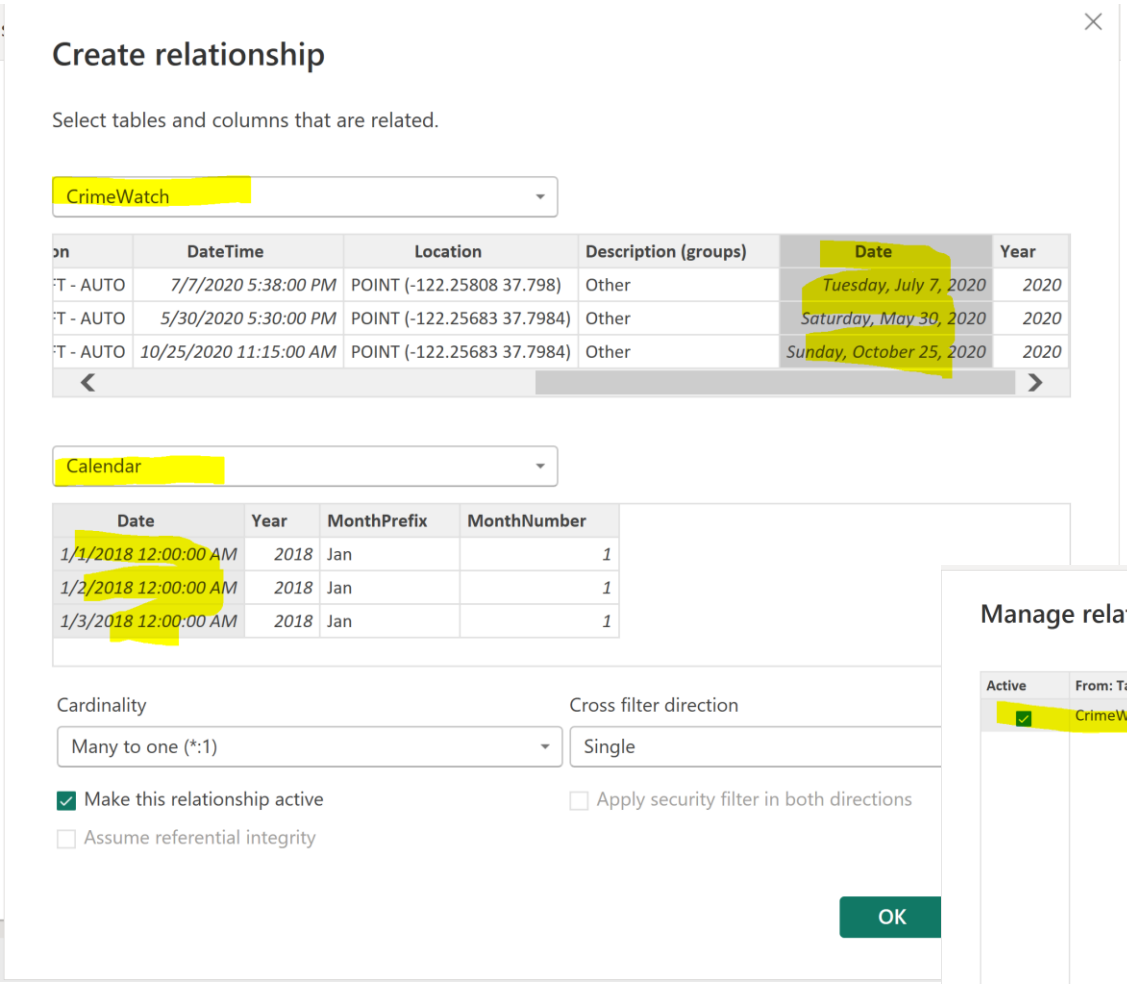
New Table

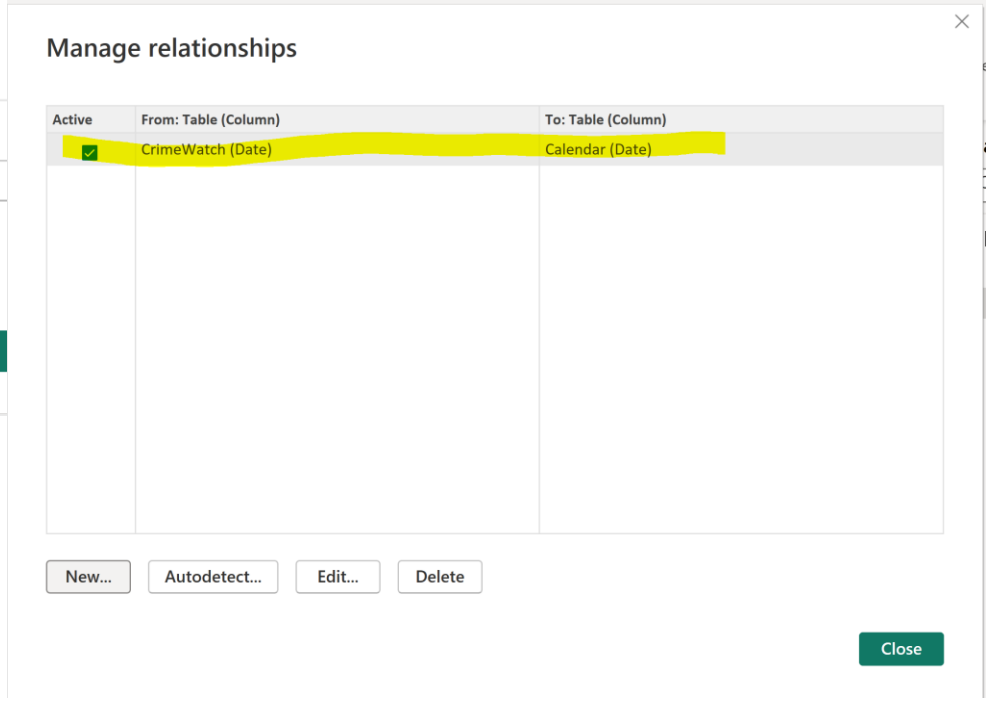

File
Home
Insert
Modeling
View
Optimize
Help
External tools
Table tools
Name
Calendar
Structure
Mark as date table
Calendars
Manage relationships
Relationships
New measure
Quick measure
New column
New table
Calculations
1 Calendar = CALENDAR ("01-01-2018", "12-31-2023")
Build visuals with your data
Select or drag fields from the Data pane onto the report canvas.

MANAGE RELATIONSHIP

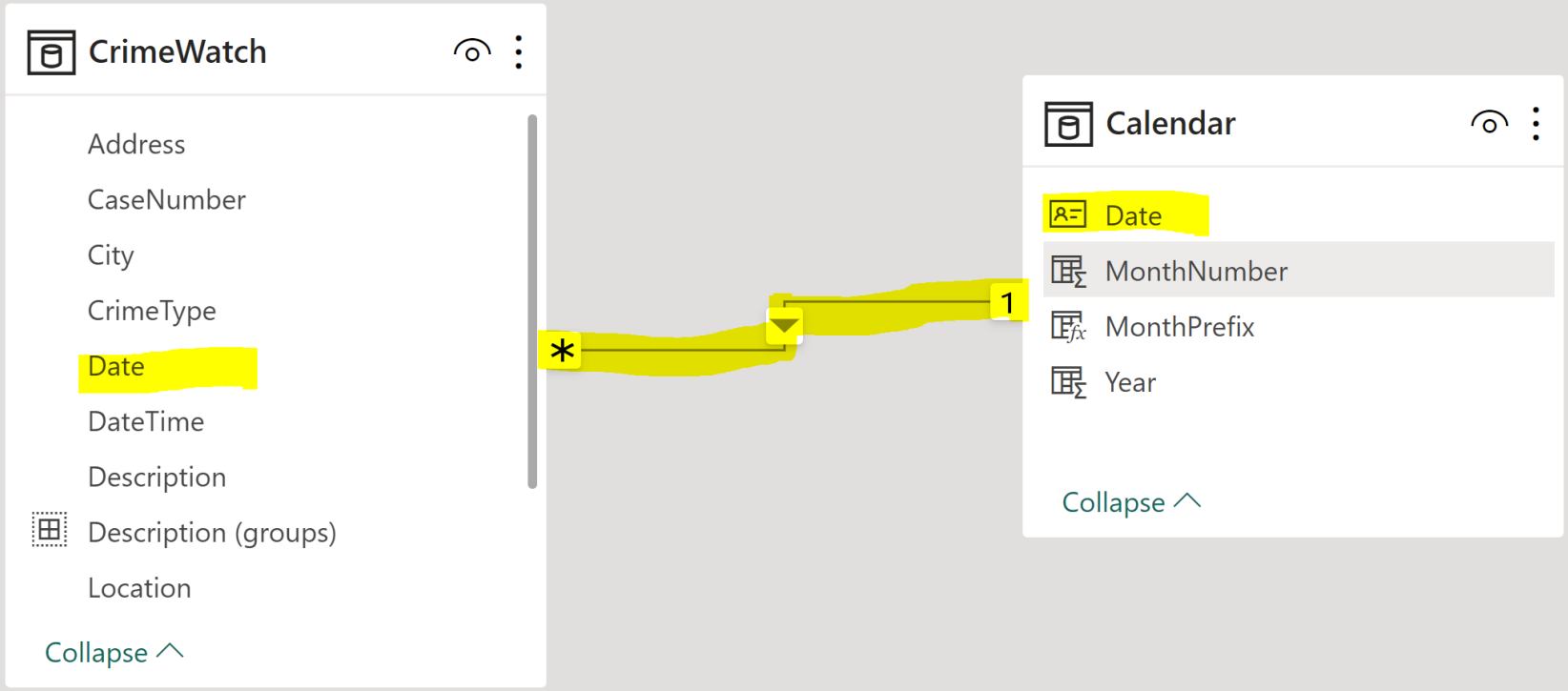


MANAGE RELATIONSHIP

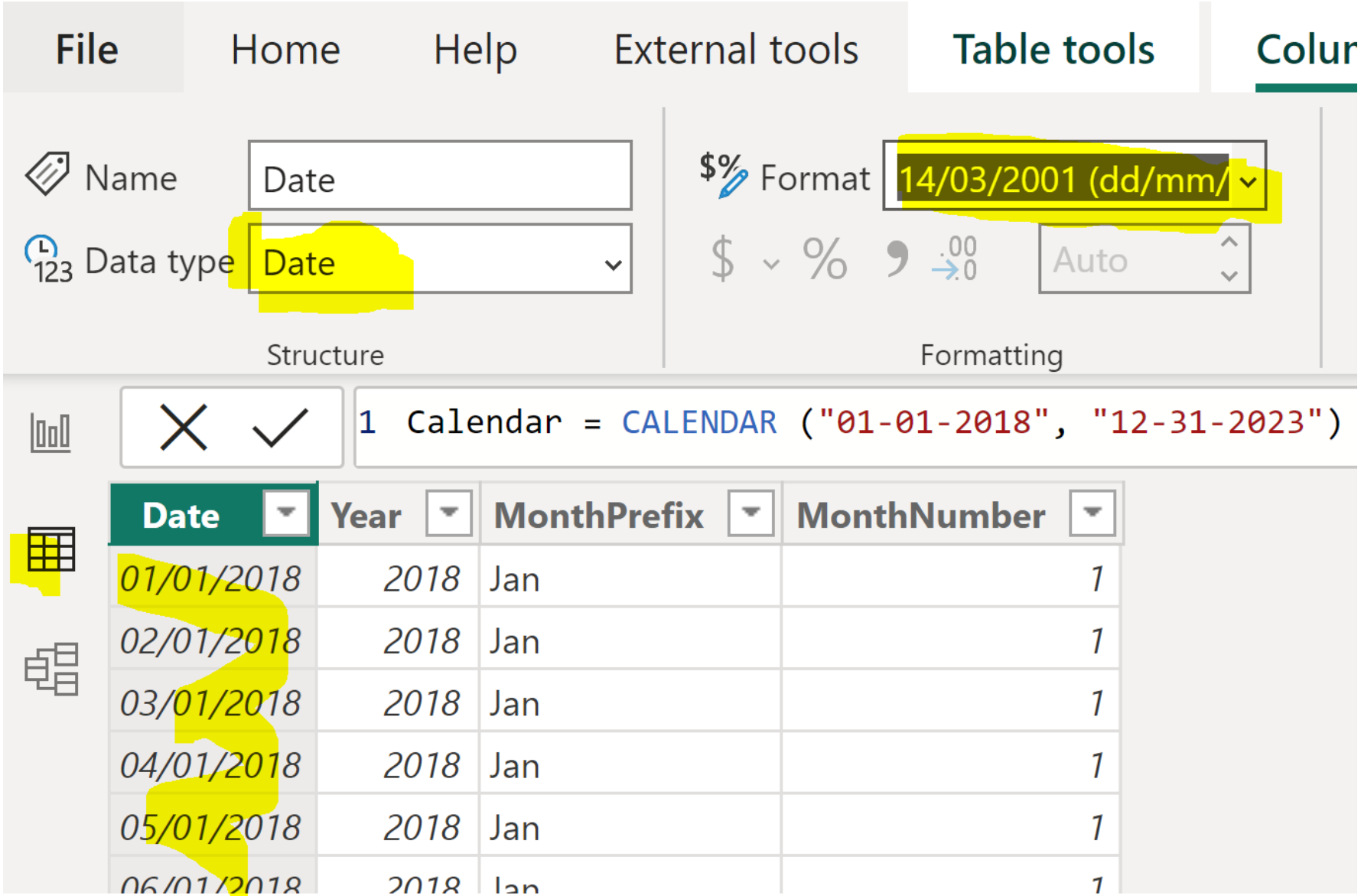




Manage Relationship



CHANGE DATE TYPE



Calculated Columns

```
Year = YEAR ('Calendar'[Date])
```

```
MonthNumber = MONTH ('Calendar' [Date])
```

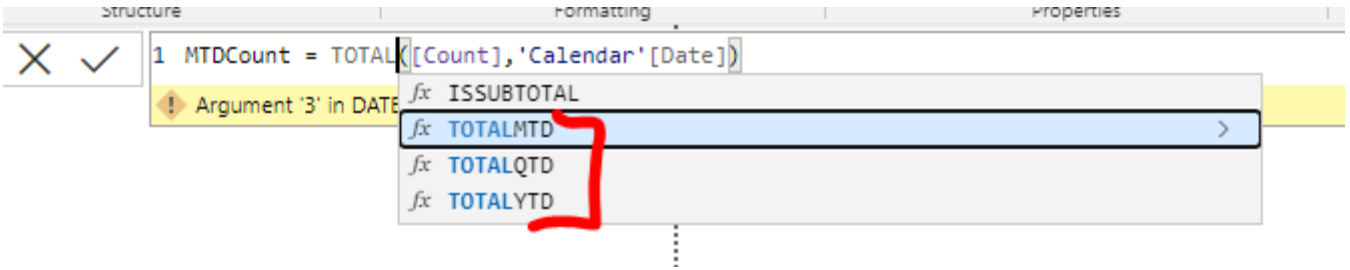
```
MonthPrefix = FORMAT ('Calendar' [Date], "MMM")
```

```
DateWithCrimes = 'Calendar'[Date]<=MAX('CrimeWatch'[Date])
```

Time Intelligence

```
Count = Count('CrimeWatch'[CaseNumber])
```

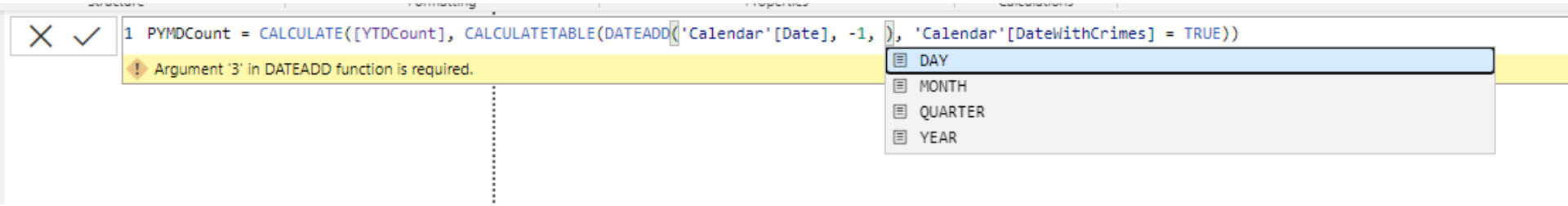
```
YTDCount = TOTALYTD([Count],'Calendar'[Date])
```




```
MTDCount = TOTALMTD([Count],'Calendar'[Date])
```

Time Intelligence

```
PYTDCount = CALCULATE([YTDCount],
CALCULATETABLE(DATEADD('Calendar'[Date], -1, YEAR),
'Calendar'[DateWithCrimes] = TRUE))
```



Time Intelligence

YEAR

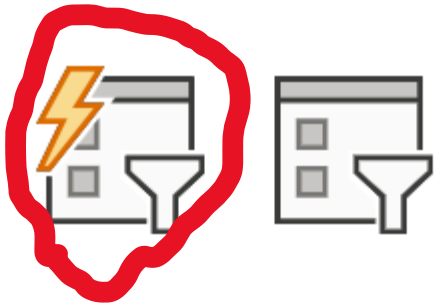
```
YOYTDCount = IF(NOT ISBLANK([YTDCount]) && NOT
ISBLANK([PYTDCount]), [YTDCount] - [PYTDCount])

YOYTD% = IF([PYTDCount] = 0, "NC",
DIVIDE([YOYTDCount], [PYTDCount]))
```

MONTH

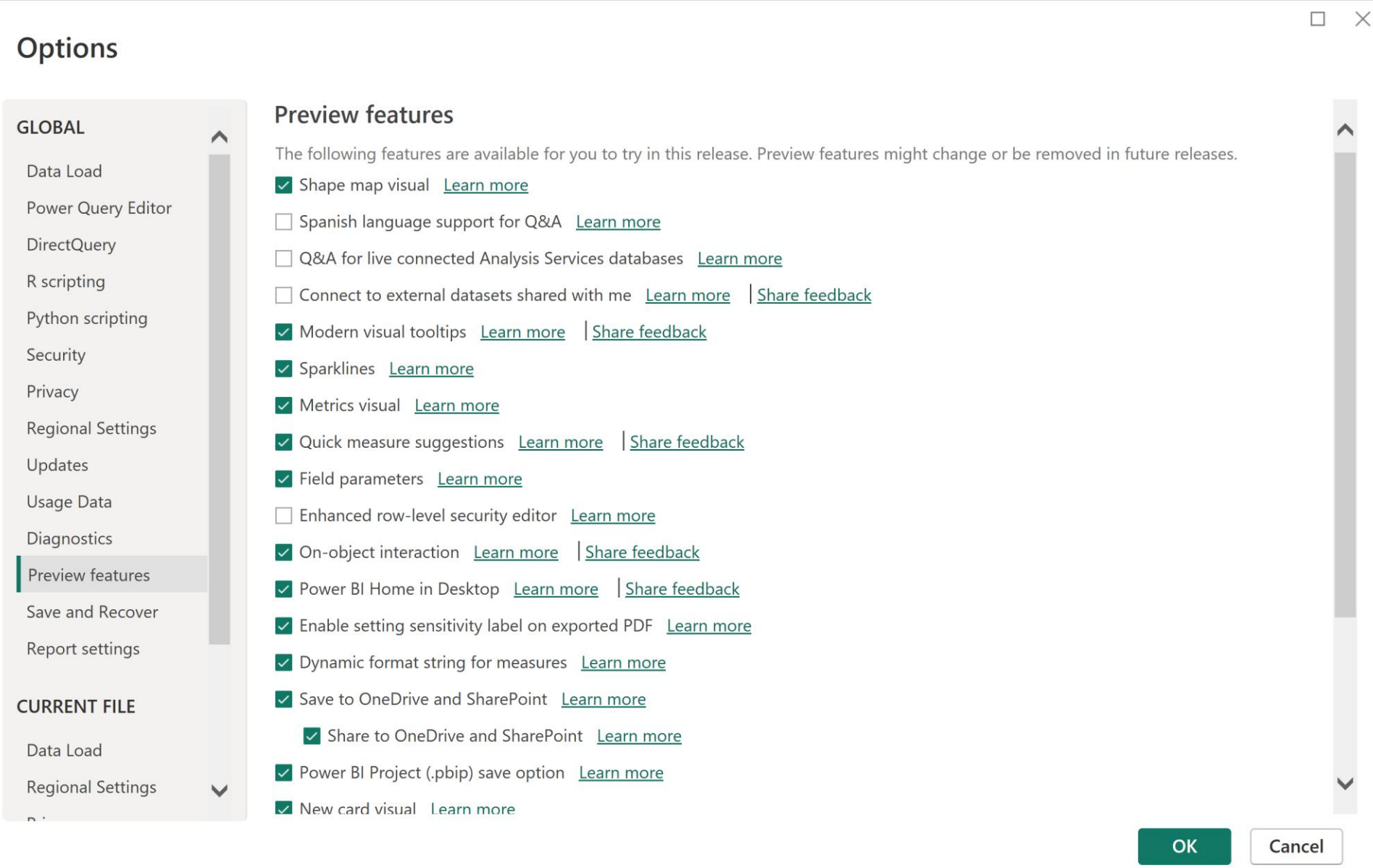
```
MOMTDCount = IF(NOT ISBLANK([MTDCount]) && NOT
ISBLANK([PMTDCount]), [MTDCount] - [PMTDCount])

MOMTD% = IF([PMTDCount] = 0, "NC",
DIVIDE([MOMTDCount], [PMTDCount]))
```

Power BI New Filter

Slicer

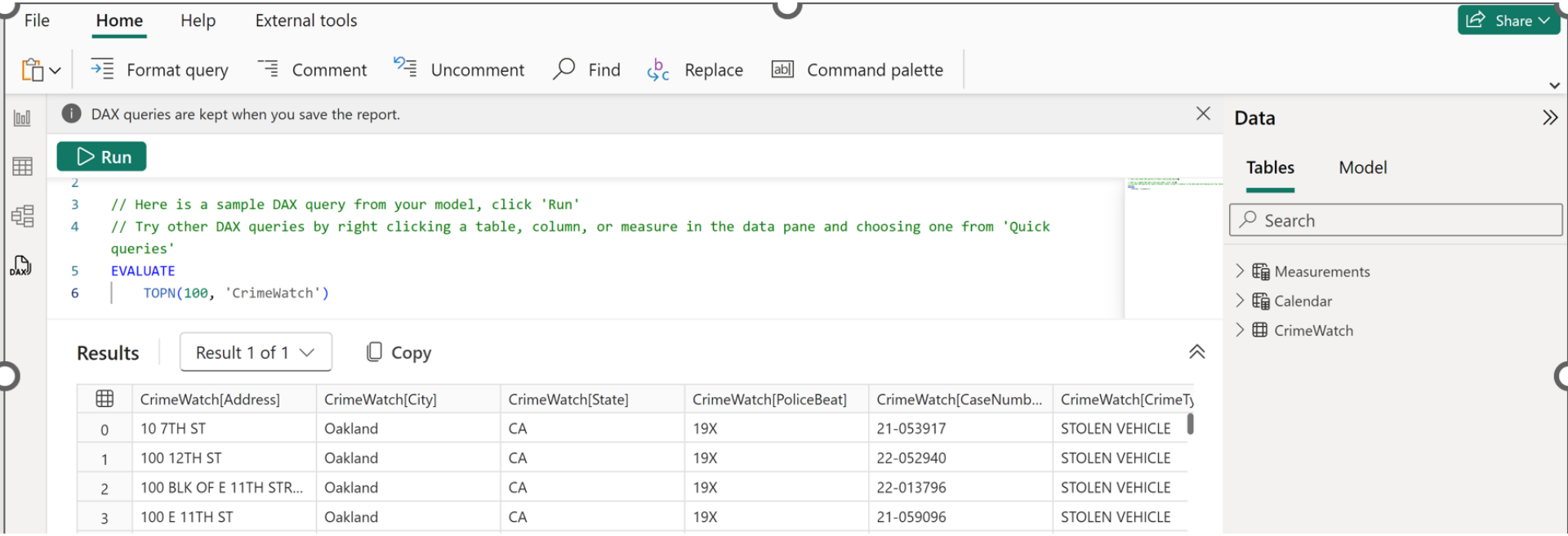


Power BI Preview Features

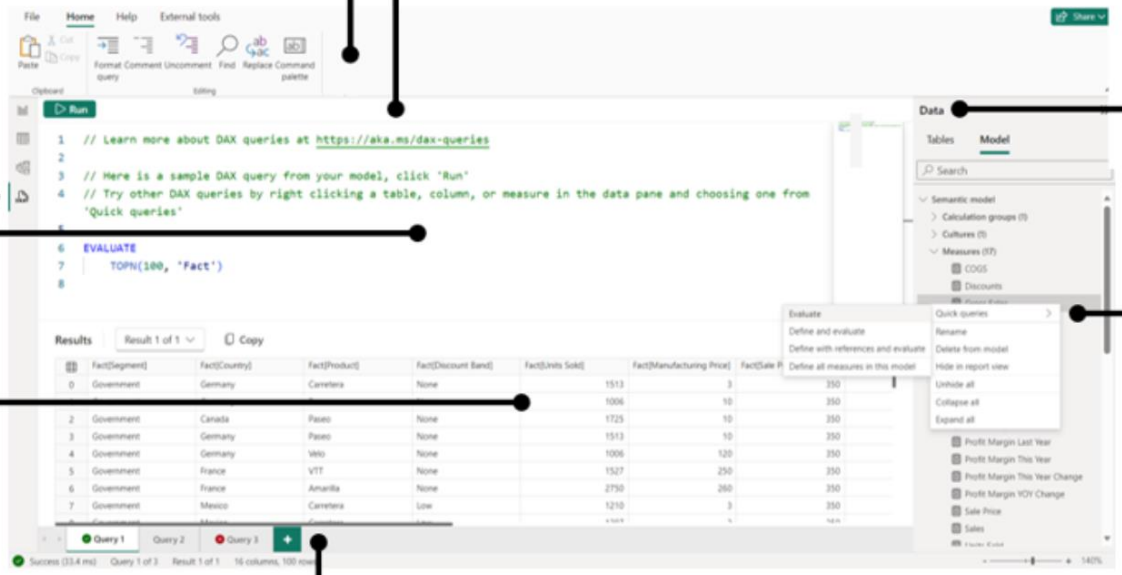


Power BI Quick Measure Suggestions

https://powerbi.microsoft.com/en-us/blog/deep-dive-into-dax-query-view-and-writing-dax-queries/



Power BI Quick Measure Suggestions



Ribbon:
Common actions to help in writing DAX queries

Command bar:
Critical actions needed for running DAX queries

Data pane:
See model tables and columns to use in DAX queries.

DAX query view:
Access via 4th view in Power BI Desktop

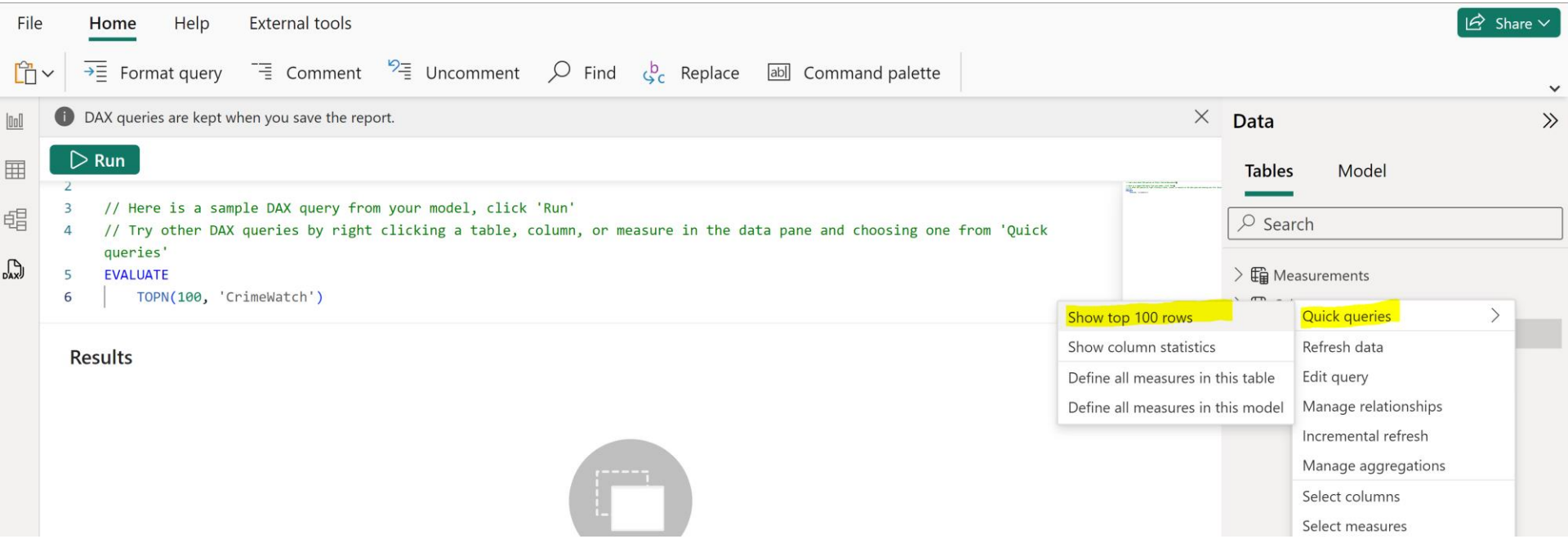
DAX query editor:
Write DAX queries

Results grid:
Results of the DAX query

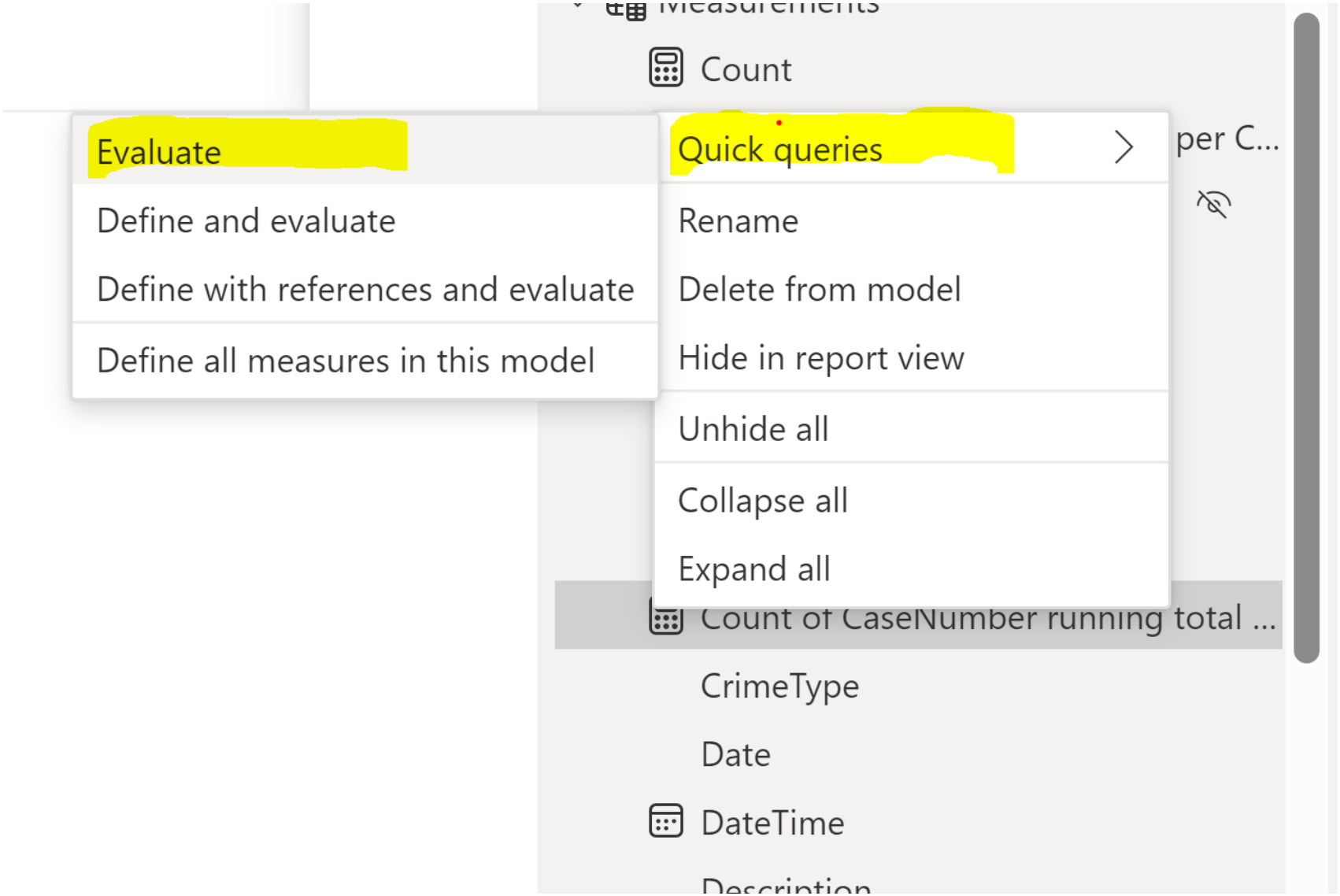
Quick queries:
Generated DAX queries from tables, columns, and measures.

Query tabs:
Create, remove, and navigate multiple DAX queries & see status of queries

Power Quick Measure Suggestions - Table



Power Quick Measure Suggestions - Measure



Power BI Feature Summary

- ✓ https://powerbi.microsoft.com/en-us/blog/

Additional Information (Books)

- ✓ **Entry Level**
  - ✓ *Beginning DAX with Power BI* (2018) by Phillip Seamark
  - ✓ *The Definitive Guide to DAX: Business Intelligence for Microsoft Power BI, SQL Server Analysis Services, and Excel* (2019) by Marco Russo and Alberto Ferrari

- ✓ **Advance Level**
  - ✓ *DAX Cookbook* (2020) by Greg Deckler
  - ✓ *Pro DAX and Data Modeling on Power BI* (2023) by Adam Aspin
  - ✓ *Extreme DAX* (2022) by Michiel Rozema and Henk Vlootman

- ✓ **Time Intelligence**
  - ✓ *DAX Patterns* (2020) by Marco Russo and Alberto Ferrari

https://www.daxpatterns.com/patterns/

Additional Information (Links)

- ✓ Websites, Blogs, and YouTube channels

  - ✓ Power Query documentation
    https://docs.microsoft.com/en-us/power-query
  - ✓ Power BI documentation
    https://docs.microsoft.com/en-us/power-bi/
  - ✓ Power BI Tips
    https://powerbi.tips/
  - ✓ RADACAD
    https://radacad.com/
  - ✓ SQLBI
    https://www.sqlbi.com/
  - ✓ Guy in a Cube
    https://guyinacube.com/
  - ✓ Curbal
    https://www.youtube.com/channel/UCJ7UhloHSA4wAqPzyi6TOkw

Conclusions & Questions

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