

تحليل البيانات باستخدام أدوات ذكاء الأعمال
لمايكروسوفت اكسيل
الجزء الأول



تحليل البيانات باستخدام أدوات ذكاء الأعمال لمايكروسوفت اكسيل

نبذة عن الكورس

- في هذا الكورس سنتعلم مفهوم تحليل البيانات وسنتعرف على أدوات التحليل من البداية
- سنتعلم مراحل التعامل مع البيانات وأنواع ومصادر البيانات المختلفة
- سندرس ال Pivot Table and Chart بعمق كأساس أولي في تحليل أي بيانات
- في الجزء الثاني من الكورس سندخل أعمق وأعمق في عالم تحليل البيانات وسنتعرف بشكل مبدئي على أهم الأدوات المتقدمة المستخدمة في تحليل البيانات مثل ال Power Pivot and Power Query وسنعرف أيضاً ماذا تعني DAX أو ال Data Analysis Expression وكيفية استخدامهم والاستفادة منهم في تجهيز البيانات وتحليلها.

تحليل البيانات باستخدام أدوات ذكاء الأعمال لمايكروسوفت اكسيل

الفصل الأول : إتقان استخدام ال Pivot table كخطوة أولى لتحليل بيانات احترافي

- مفهوم تحليل البيانات والأعمال
- أنواع مصادر البيانات المختلفة
- تحضير المعلومات وتطبيق الفلاتر والترتيب المختلف على البيانات
- تصميم ال Pivot table بشكل احترافي ومفصل
 - إظهار المعلومات بأفضل الطرق
 - تحديث مصدر البيانات وتفاذي فقد المعلومات
 - تطبيق فلاتر متقدمة على ال Pivot table
 - تطبيق ترتيب متقدم للمعلومات داخل ال Pivot table
 - تجميع المعلومات Data Grouping
 - إظهار النتائج بأشكال مختلفة Show value as
 - استخدام ال Calculated Field and Calculated Items

تحليل البيانات باستخدام أدوات ذكاء الأعمال لمايكروسوفت اكسيل

الفصل الأول : إتقان استخدام ال Pivot table كخطوة أولى لتحليل بيانات احترافي

ما هي ال Pivot Chart ولماذا يمكن استخدامها؟

- إتقان استخدام جميع أنواع الرسوم البيانية

- استخدام ال Slicers

- استخدام ال Timelines

تحليل البيانات باستخدام أدوات ذكاء الأعمال لمايكروسوفت اكسيل

الفصل الثاني: تعرف على الأدوات الرئيسية لتحليل بيانات متقدم وأكثر احترافاً

- Power Query and Power Pivot متى ولماذا؟
- استخدام الـ Power Query وتعاملها مع البيانات
- مقدمة عن الـ Power Pivot
- ما هو الـ DAX؟
- تحضير البيانات داخل الـ Power Query لتكون جاهزة للتحليل

تحليل البيانات باستخدام أدوات ذكاء الأعمال لمايكروسوفت اكسيل

من المستفيد من الكورس؟

- هذا الكورس لكل صاحب أو مدير مشروع أو بزنس يريد أن يمتلك مهارة تحليل البيانات والتي عن طريقها سيستطيع أخذ القرار السليم
- هذا الكورس لأي خريج يريد العمل في مجال تحليل البيانات كواحد من المجالات الجديدة في مصر والتي يكثر عليها الطلب ولها مستقبل عظيم



جميع الحقوق محفوظة - إعمل بيزنس



جميع الحقوق محفوظة - إعمل بيزنس



Data Analysis Processing



Collecting Data

Cleaning Data

Manipulating Data

Analyzing data

Visualizing Data

جمع البيانات

تنظيف البيانات

معالجة البيانات

تحليل البيانات

الشكل النهائي لعرض البيانات



Collecting Data
جمع البيانات



Cleaning Data
تنظيف البيانات



Manipulating Data
معالجة البيانات



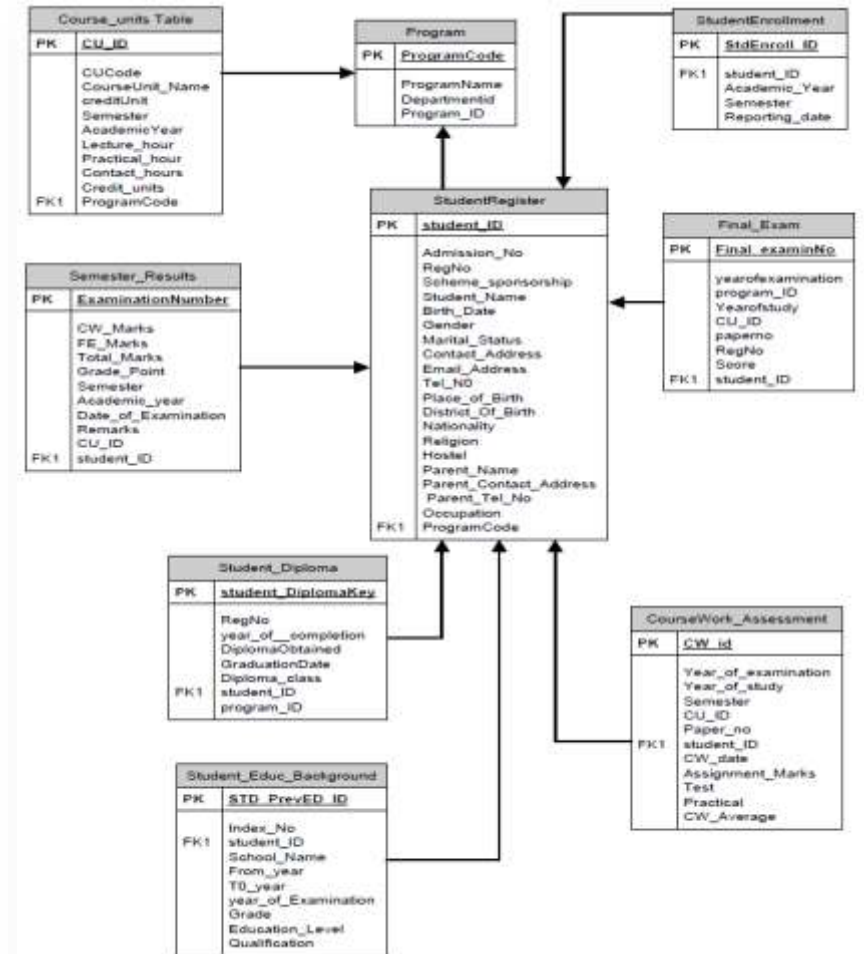
Analyzing data
تحليل البيانات



Visualizing Data
الشكل النهائي لعرض البيانات

One Data Table – One Data Source

	A	B	C	D	E	F
1	Region	Market	Business Segment	Jan Sales Amount	Feb Sales Amount	Mar Sales Amount
2	Europe	France	Accessories	2,628	8,015	3,895
3	Europe	France	Bikes	26,588	524,445	136,773
4	Europe	France	Clothing	6,075	17,172	6,043
5	Europe	France	Components	20,485	179,279	54,262
6	Europe	Germany	Accessories	2,769	6,638	2,615
7	Europe	Germany	Bikes	136,161	196,125	94,840
8	Europe	Germany	Clothing	7,150	12,374	7,159
9	Europe	Germany	Components	46,885	56,611	29,216
10	Europe	United Kingdom	Accessories	4,205	2,579	5,745
11	Europe	United Kingdom	Bikes	111,830	175,522	364,844
12	Europe	United Kingdom	Clothing	7,888	6,763	12,884
13	Europe	United Kingdom	Components	31,331	39,005	124,030
14	North America	Canada	Accessories	3,500	12,350	9,768



لماذا نستخدم Format As Table tools؟

1. تنسيق الجدول بسهولة وبأقل مجهود
2. تطبيق أدوات الفلتر والترتيب بشكل تلقائي
3. التجميد التلقائي لصفوف العنوان
4. تحديد كل الجدول بكلمة واحدة
5. سهولة إعادة ترتيب الصفوف
6. إعادة ضبط الجدول عند إضافة أي عمود أو صف
7. سهولة طباعة الجدول فقط
8. تطبيق المعادلة على جميع الإدخالات بشكل أوتوماتيكي
9. إضافة row Total يمكن استخدامه بفاعلية
10. إضافة Slicer بدون تحويل الداتا إلى Pivot Table
11. سهولة تحويل الداتا إلى Pivot Table وإمكانيات التحديث التلقائي

Mastering Working with Pivot Tables

Grouping and ungrouping Data

• عمل Grouping للتاريخ

• Days

• Days/Months

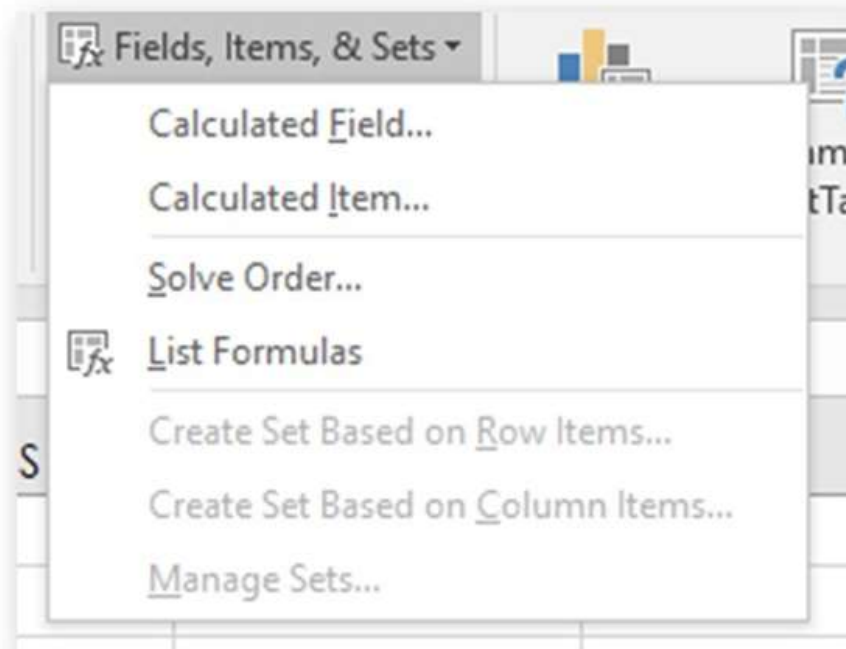
• Months/Quarters

• Year/Quarters

• عمل Grouping لشرائح المبيعات

• عمل Grouping للنصوص

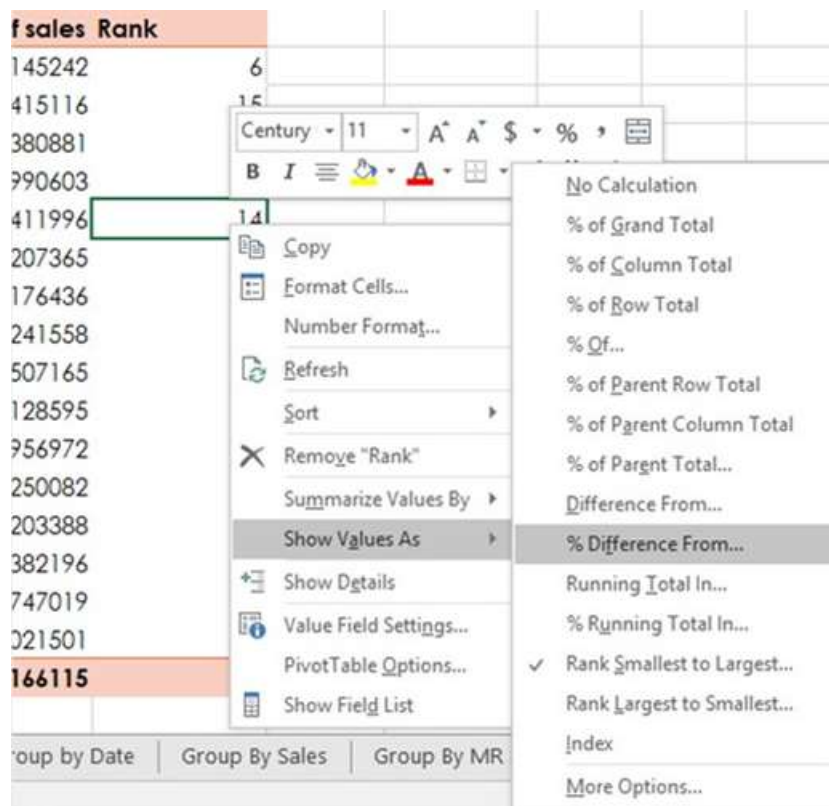
Calculated Field and Item



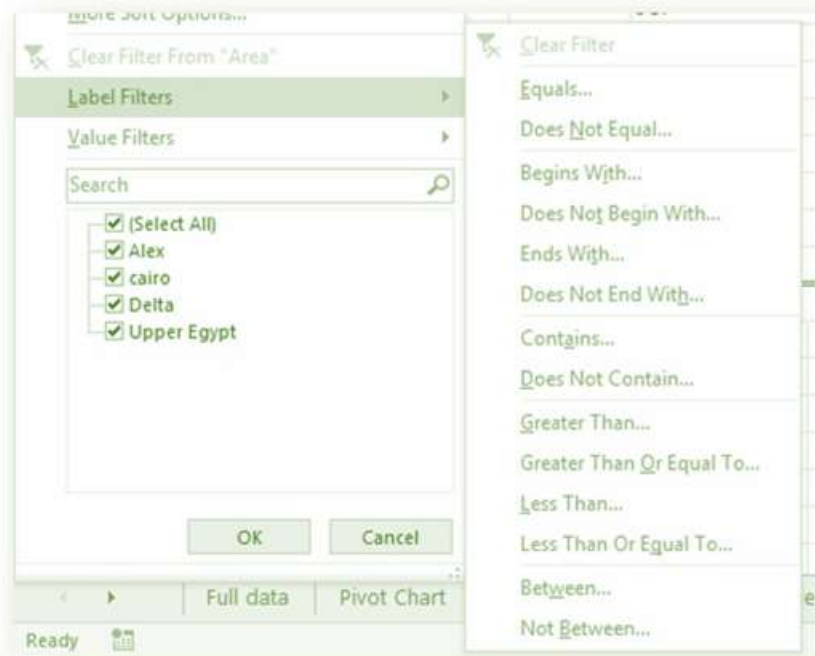
استخدام المعادلات داخل ال Pivot Table

- معادلات الحقول Calculated Field
- معادلات العناصر Calculated item
- استخدام معادلة Get Pivot Data

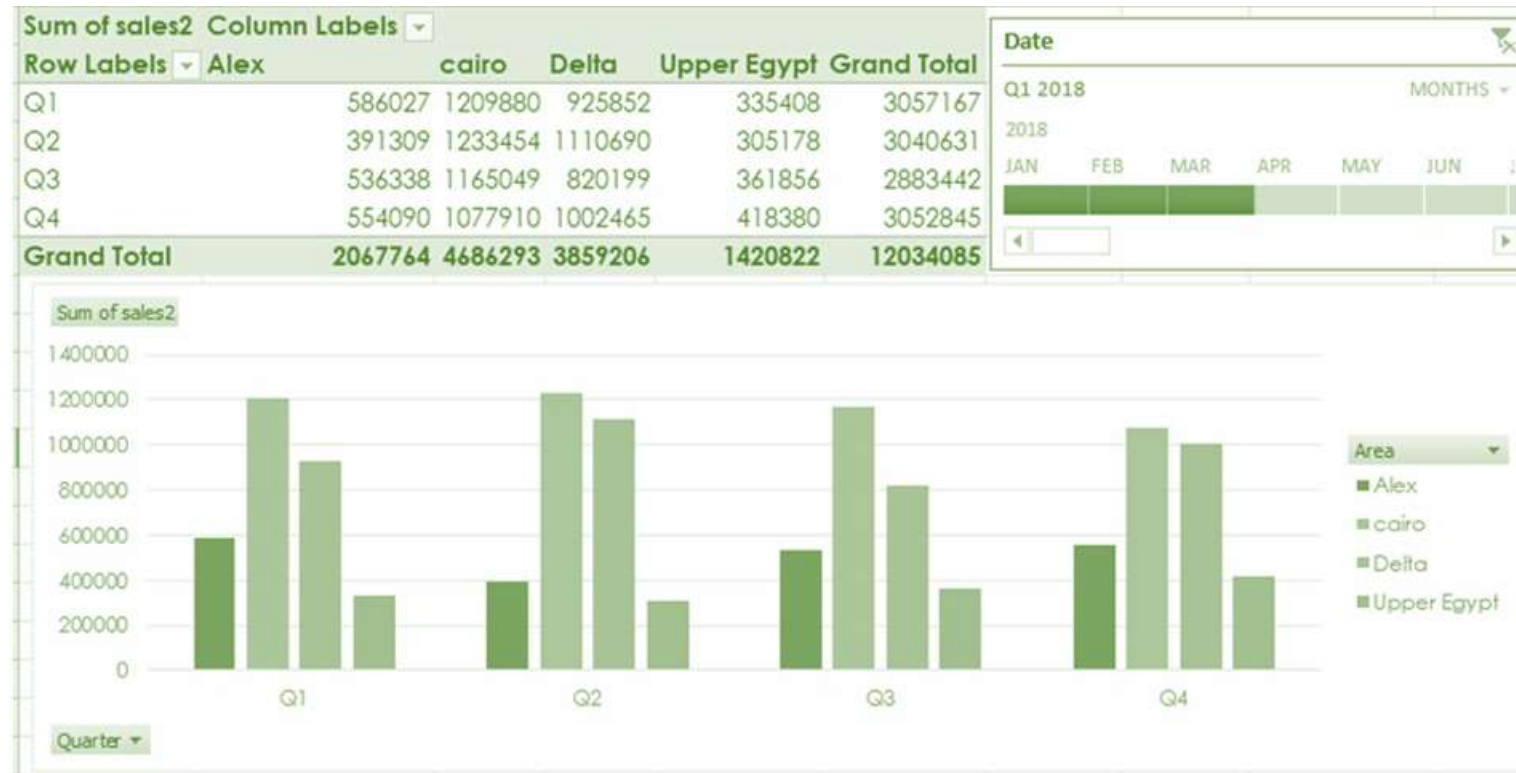
Show Value AS



Sorting and Filtering

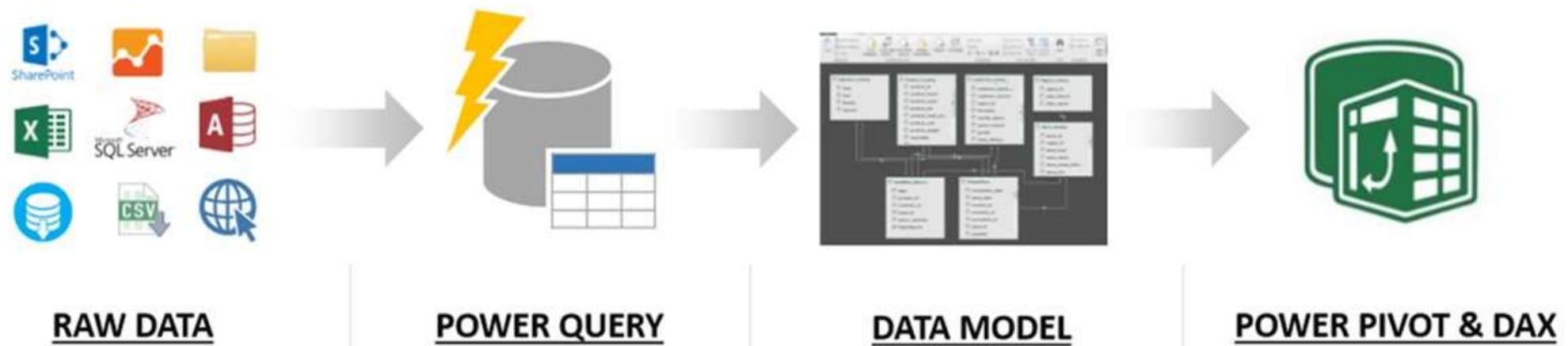


Pivot Chart



Slicer and Timeline







RAW DATA

Flat files (csv, txt), Excel tables, databases (SQL, Azure), folders, streaming sources, web data, etc.



POWER QUERY

(aka "Get & Transform")

Connect to sources, import data, and apply shaping and transformation tools (ETL)



DATA MODEL

Create table relationships, add calculated columns, define hierarchies and perspectives, etc.



POWER PIVOT & DAX

Explore and analyze the entire data model, and create powerful measures using Data Analysis Expressions (DAX)



“THE BEST THING TO HAPPEN TO EXCEL IN 20 YEARS”

Power Pivot

لماذا تعتبر أدوات ذكاء الأعمال بمايكروسوفت أكسيل هي الأفضل للاستخدام؟

- التعامل مع ملايين الإدخالات والبيانات من شتى مصادر البيانات
- سهولة وسرعة دمج ومزج البيانات وإنشاء علاقات بين البيانات من مصادر متعددة
- إنشاء نظام آلي بشكل كامل في تشكيل وهيكلية البيانات
- إنشاء التحليلات والاستعلامات المختلفة باستخدام تقنية DAX Data Analysis Expression

More than million row

1: IMPORT & ANALYZE MILLIONS OF ROWS

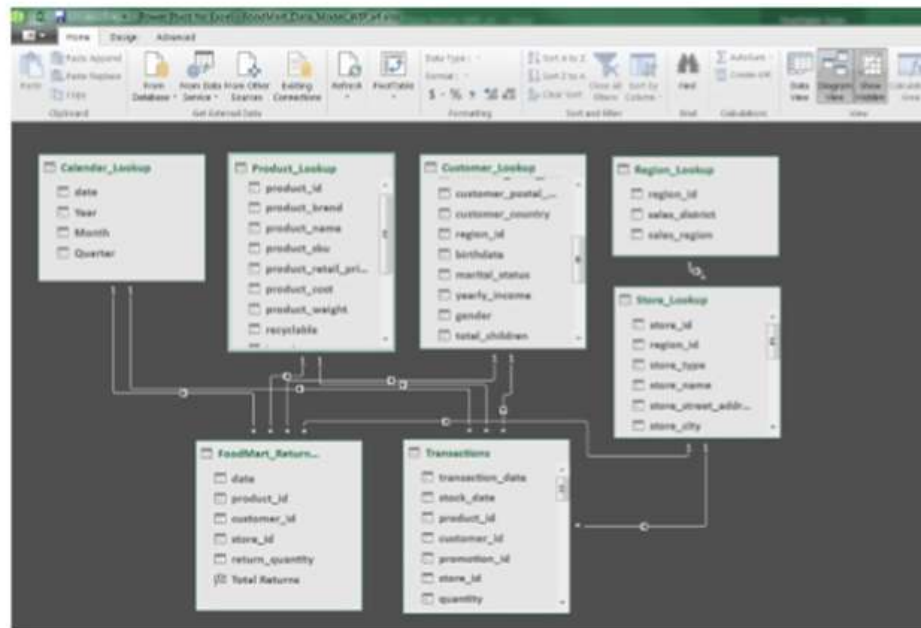


When was the last time you loaded
25,000,000 rows of data into Excel?

When you connect to data with **Power Query**
and load it to Excel's **Data Model**, the data is
compressed and stored in memory, NOT in
worksheets (*no more 1,048,576 row limit!*)

customer_id	product_id	shop_id	quantity	Add Column
24476632	58983	3901	1	2
24476633	58984	2852	1	2
24476634	58985	384	1	2
24476635	58985	502	1	2
24476636	58985	1410	1	2
24476637	58985	2080	1	2
24476638	58987	313	1	2
24476639	58987	1334	1	2
24476640	58987	2019	1	2
24476641	58987	2783	1	2
24476642	58987	3108	1	2
24476643	58987	3485	1	2
24476644	58987	3544	1	2
24476645	58988	189	1	2
24476646	58988	300	1	2
24476647	58988	402	1	2
24476648	58988	446	1	2
24476649	58988	500	1	2
24476650	58988	542	1	2
24476651	58988	1163	1	2
24476652	58988	1172	1	2
24476653	58988	1649	1	2
24476654	58988	1706	1	2
24476655	58988	1732	1	2

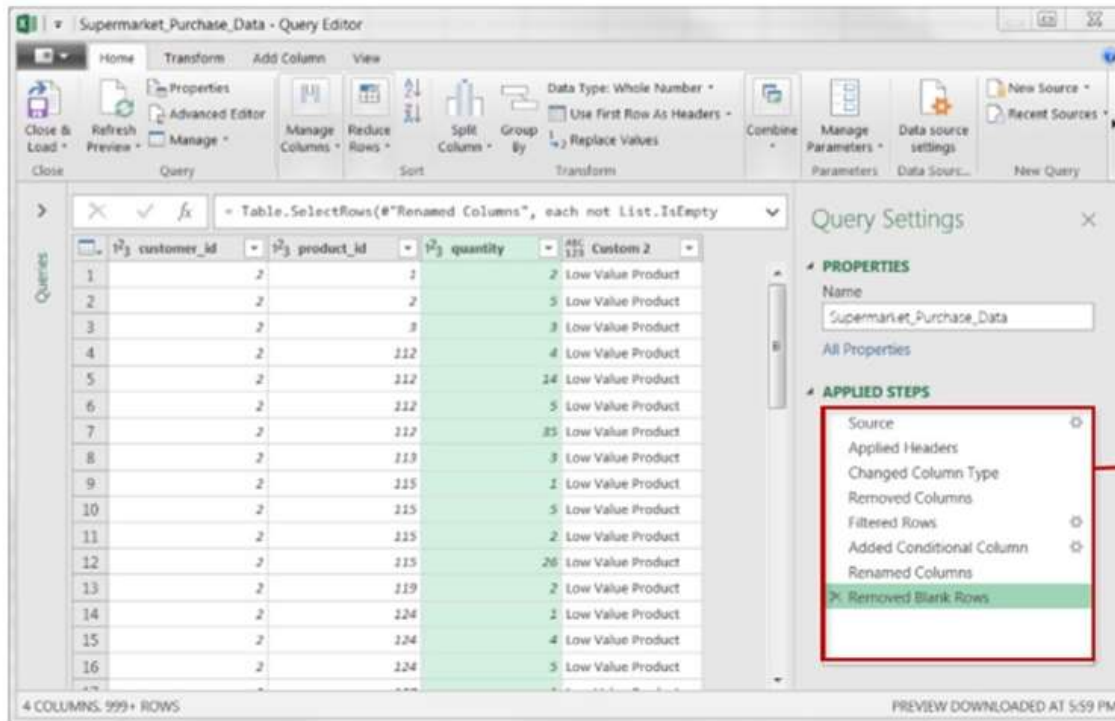
2: BUILD DATA MODELS TO BLEND SOURCES



This is an example of a Data Model in “**Diagram View**”, which allows you to create connections between tables

Instead of manually stitching tables together with cell formulas, you create **relationships** to blend data based on common fields

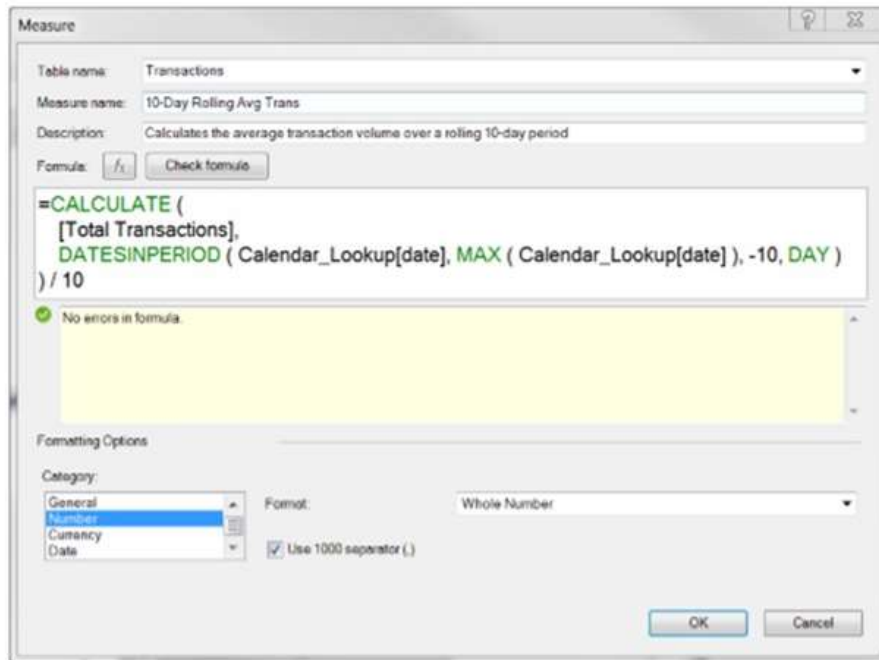
3: AUTOMATE YOUR DATA PROCESSING



With Power Query, you can **filter, shape and transform** your raw data before loading it into the data model

Each step is **automatically recorded and saved with the query**, and applied whenever the source data is refreshed – like a macro!

4: CREATE POWERFUL MEASURES WITH DAX



Measure

Table name: Transactions

Measure name: 10-Day Rolling Avg Trans

Description: Calculates the average transaction volume over a rolling 10-day period

Formula: `=CALCULATE ([Total Transactions], DATESINPERIOD ( Calendar_Lookup[date], MAX ( Calendar_Lookup[date] ), -10, DAY ) ) / 10`

No errors in formula.

Formatting Options

Category: Number

Format: Whole Number

☒ Use 1000 separator (.)

OK Cancel

Measures are flexible and powerful calculations defined using **Data Analysis Expressions (DAX)**

In this case we're using a DAX time intelligence formula to calculate a **10-day rolling average**



عندما ترغب في: Power Query and Power pivot استخدم الـ

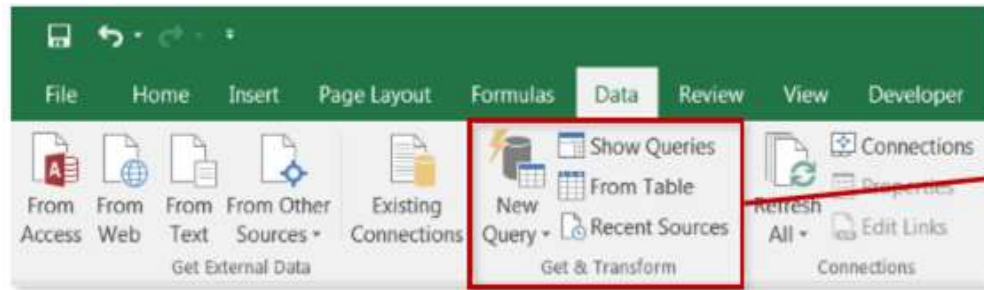
- مزج البيانات خلال المصادر المختلفة والجداول المتعددة
- إنشاء العلاقات بين مصادر المعلومات المختلفة
- تحليل البيانات التي يزيد حجمها عن حجم الشيت الواحد
- إنشاء نظام آلي لتحليل البيانات وتشكيلها



Power Query

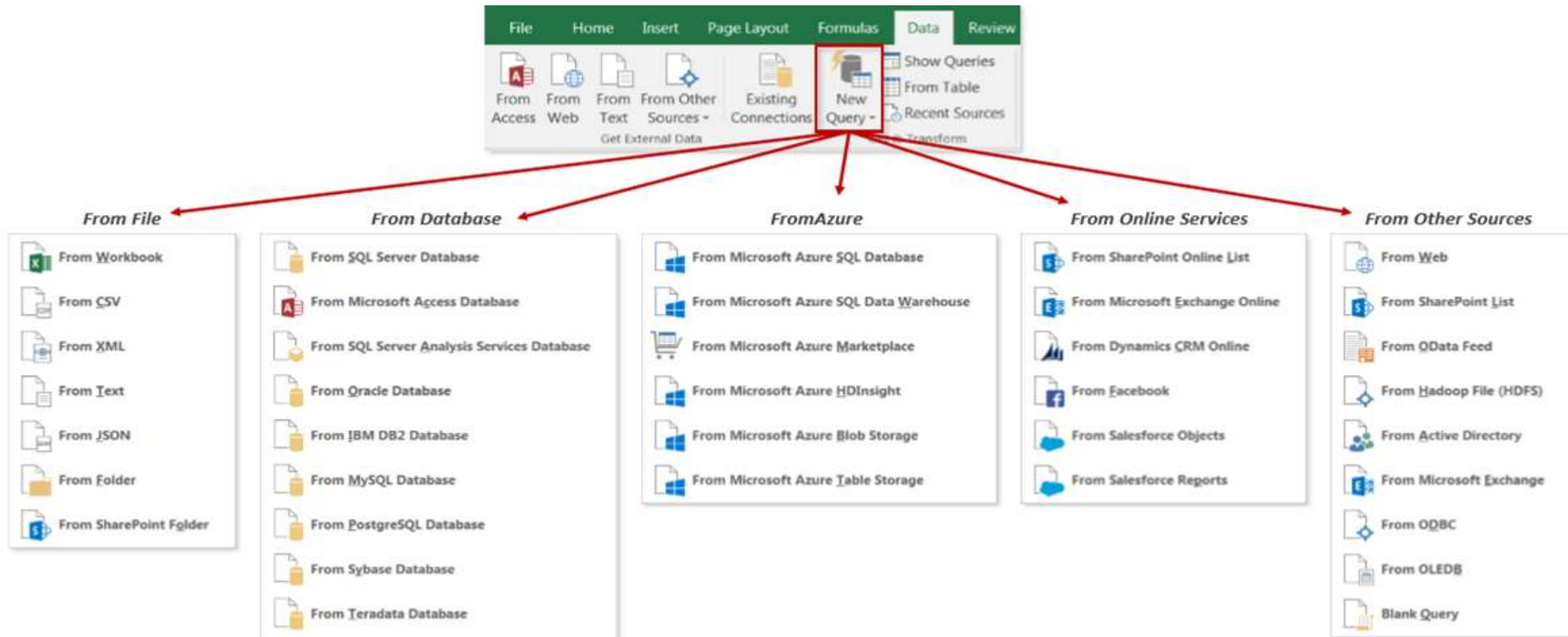
Power Query (aka “Get & Transform”) تمكنك من الآتي:

- الاتصال بالبيانات عبر مجموعة واسعة من مصادر المعلومات
- تصفية وتشكيل وتحويل البيانات لمزيد من التحليل والارتباطات بين الجداول المختلفة



The Power Query tools live in the Data tab, under the “Get & Transform” section (Excel 2016)

Types of data connections



THE QUERY EDITOR

The screenshot shows the 'FoodMart_Transactions_1997 - Query Editor' window. The interface is divided into several sections:

- Query Editing Tools:** A ribbon at the top with tabs: Home, Transform, Add Column, and View. The Home tab is active, showing options like Close & Load, Refresh, Advanced Editor, Choose Columns, Remove Columns, Keep Rows, Remove Rows, Split Column, Group By, Data Type, Use First Row As Headers, Replace Values, Merge Queries, Append Queries, Manage Parameters, Data source settings, New Source, and Recent Sources.
- Formula Bar:** Located below the ribbon, it contains the M-code: `= Table.TransformColumnTypes(#"Promoted Headers",{"date", type date}, {"product_id",`
- Data Preview:** A table showing the first 14 rows of data. The columns are: date, product_id, customer_id, promotion_id, store_id, and quantity. The data is filtered to show rows where the date is 1/1/1997.
- Query Settings:** A panel on the right side of the window. It has two sections: 'PROPERTIES' and 'APPLIED STEPS'. The 'PROPERTIES' section shows the Name 'FoodMart_Transactions_1997'. The 'APPLIED STEPS' section shows a list of steps: 'Source', 'Promoted Headers', and 'Changed Type' (which is highlighted).

Annotations with red arrows point to these sections:

- Query Editing Tools:** Points to the ribbon.
- Formula Bar (this is "M" code):** Points to the formula bar.
- Name your table!:** Points to the 'Name' field in the 'PROPERTIES' section.
- Applied Steps:** Points to the 'APPLIED STEPS' section.
- Data Preview:** Points to the data table.

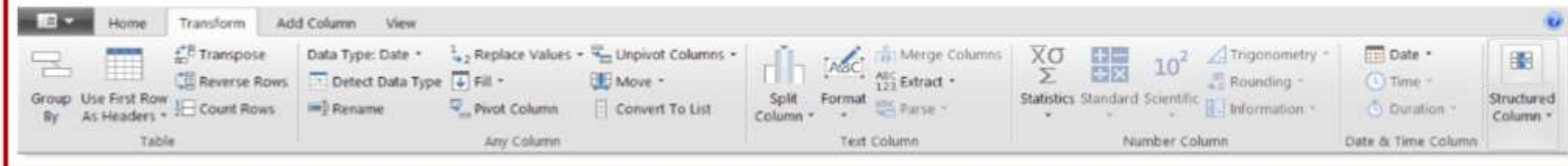
Access the **Query Editor** by creating a new query and choosing the **"Edit"** option, or by launching the Workbook Queries pane (**Data > Show Queries**) and right-clicking an existing query to edit

QUERY EDITOR TOOLS

The **HOME** tab includes **general settings** and **common table transformation tools**



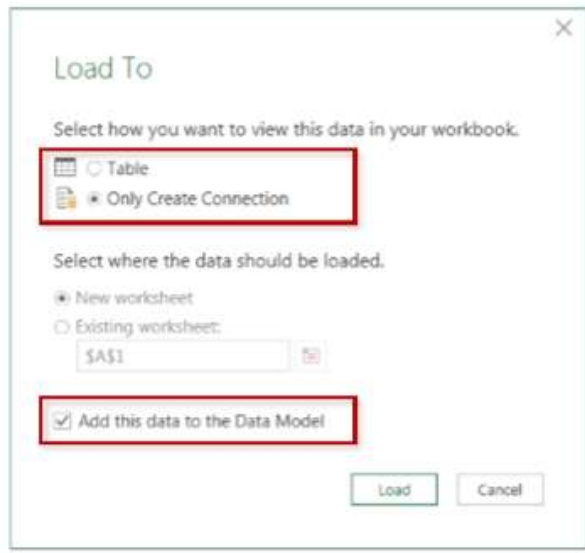
The **TRANSFORM** tab includes tools to **modify existing columns** (splitting/grouping, transposing, extracting text, etc.)



The **ADD COLUMN** tools **create new columns** based on conditional rules, text operations, calculations, dates, etc.



DATA LOADING OPTIONS



When you load data from Power Query, you have several options:

- **Table**
 - *Stores the data in a new or existing worksheet*
 - *Requires relatively small data sets (<1mm rows)*
- **Connection Only**
 - *Saves the data connection settings and applied steps*
 - *Data does not load to a worksheet*
- **Add to Data Model**
 - *Compresses and loads data to Excel's Data Model*
 - *Makes data accessible to Power Pivot for further analysis*

Let's Start with the home tab

Customer lookup

Sort values
(A-Z, Low-High, etc.)

Change data types
(date, \$, %, text, etc.)

Promote header row

Keep or remove columns

Tip: use the "Remove Other Columns" option if you always want a specific set

Keep or remove rows

Tip: use the "Remove Duplicates" option to create a new lookup table from scratch

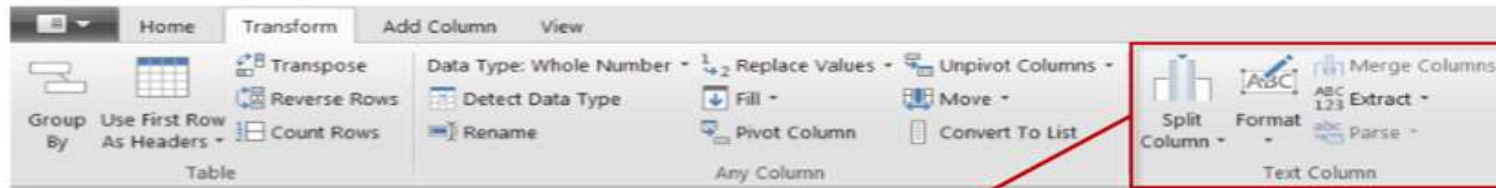
Duplicate, move & rename columns

Tip: Right-click the column header to access common tools

transaction_date		
1	1/	
2	1/	
3	1/	
4	1/	
5	1/	
6	1/	
7	1/	
8	1/	
9	1/	
10	1/	
11	1/	
12	1/	
13	1/	
14	1/	
15	1/	
16	1/	
17	1/	
18	1/	
19	1/	
20	1/1/1997	12/29/1996
21	1/1/1997	12/27/1996
22	1/1/1997	12/31/1996
23	1/1/1997	12/26/1996

Dealing With Text

Store lookup



Split a text column based on either a specific delimiter or a number of characters



HEY THIS IS IMPORTANT!

You can access many of these tools in both the “Transform” and “Add Column” menus -- the difference is whether you want to **add a new column** or **modify an existing one**



Format a text column to upper, lower or proper case, or add a prefix or suffix

Tip: Use “Trim” to eliminate leading & trailing spaces, or “Clean” to remove non-printable characters

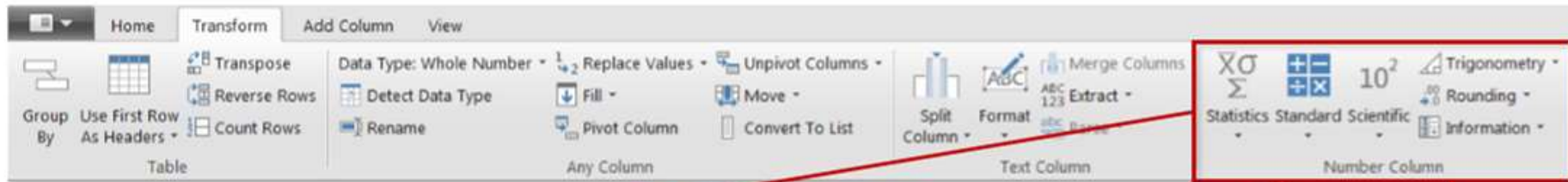


Extract characters from a text column using a fixed length, first or last, or a defined range

Tip: Select two or more columns to **merge** or **concatenate** fields

Dealing With Numbers

Product Table



Sum
Minimum
Maximum
Median
Average
Standard Deviation
Count Values
Count Distinct Values

Statistics functions allow you to evaluate basic stats for the selected column (sum, min/max, average, count, countdistinct, etc)

Add
Multiply
Subtract
Divide
Integer-Divide
Modulo
Percentage
Percent Of

Standard

Absolute Value
Power
Square Root
Exponent
Logarithm
Factorial

Scientific

Sine
Cosine
Tangent
Arcsine
Arccosine
Arctangent

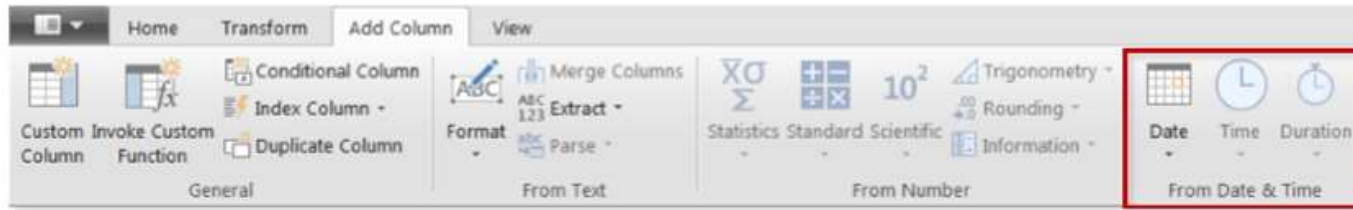
Trigonometry

Is Even
Is Odd
Sign

Information tools allow you to define binary flags (*TRUE/FALSE* or *1/0*) to mark each row in a column as even, odd, positive or negative

Dealing With Dates

Calendar



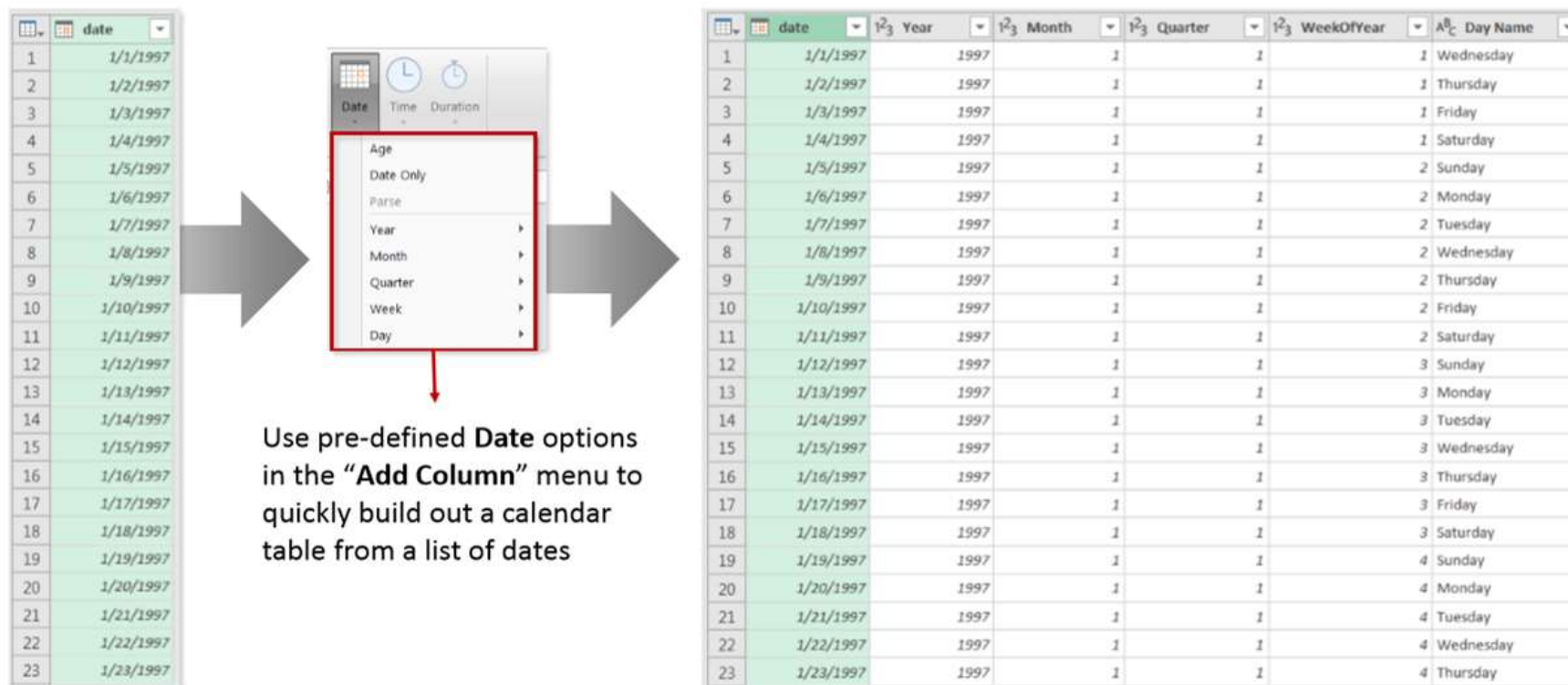
Date & Time tools are relatively straight-forward, and include the following options:

- **Age:** Difference between the current time and the date in each row
- **Date Only:** Removes the time component of a date/time field
- **Year/Month/Quarter/Week/Day:** Extracts individual components from a date field (Time-specific options include Hour, Minute, Second, etc.)
- **Earliest/Latest:** Evaluates the earliest or latest date from a column as a single value (can only be accessed from the “Transform” menu)

Note: You will almost always want to perform these operations from the “Add Column” menu to build out new fields, rather than transforming an individual date/time column

Age	
Date Only	
Parse	
Year	▶
Month	▶
Quarter	▶
Week	▶
Day	▶
Subtract Days	
Combine Date and Time	
Earliest	
Latest	

Calendar Table



Index Column



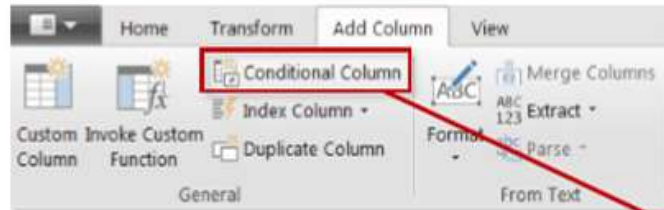
Index Columns contain a list of sequential values that can be used to identify each unique row in a table (*typically starting from 0 or 1*)

These columns are often used to create **unique IDs** that can be used to form relationships between tables (*more on that later!*)

	¹² 3 Index	transaction_date	stock_date	¹² 3 product_id	¹² 3 customer_id	¹² 3 promotion_id	¹² 3 st
1	0	1/1/1997	12/28/1996	761	6613	0	
2	1	1/1/1997	12/30/1996	1435	8830	0	
3	2	1/1/1997	12/29/1996	1175	8830	0	
4	3	1/1/1997	12/30/1996	1152	8830	0	
5	4	1/1/1997	12/31/1996	1245	5005	0	
6	5	1/1/1997	12/27/1996	209	5005	0	
7	6	1/1/1997	12/28/1996	1345	5005	0	
8	7	1/1/1997	12/28/1996	1468	5005	0	
9	8	1/1/1997	12/26/1996	84	7962	0	
10	9	1/1/1997	12/30/1996	966	7962	0	
11	10	1/1/1997	12/27/1996	1022	7962	0	
12	11	1/1/1997	12/29/1996	440	7962	0	
13	12	1/4/1997	12/28/1996	151	2274	1054	
14	13	1/4/1997	12/28/1996	1287	8648	1054	
15	14	1/4/1997	12/30/1996	1264	8648	1054	
16	15	1/4/1997	12/31/1996	188	8648	1054	
17	16	1/4/1997	1/1/1997	1526	8648	1054	
18	17	1/4/1997	12/29/1996	518	8762	1054	
19	18	1/5/1997	12/31/1996	963	4018	0	
20	19	1/5/1997	12/29/1996	154	1418	0	
21							

Conditional Columns

Trans 1997 table



Conditional Columns allow you to define new fields based on logical rules and conditions (*IF/THEN statements*)

In this case we're creating a new conditional column called **"Order Size"**, which depends on the values in the **"quantity"** column, as follows:

- If $quantity > 5$, Order Size = **"Large"**
- If quantity is **from 2-5**, Order Size = **"Medium"**
- If $quantity = 1$, Order Size = **"Small"**
- Otherwise Order Size = **"Other"**

Add Conditional Column

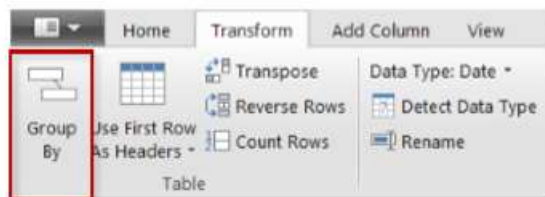
Add a conditional column that is computed from the other columns or values.

New column name
Order Size

	Column Name	Operator	Value (1)		Output (1)
If	quantity	is greater than	ABC 123 5	Then	ABC 123 Large
Else If	quantity	is greater than or...	ABC 123 2	Then	ABC 123 Medium
Else If	quantity	equals	ABC 123 1	Then	ABC 123 Small
Add Rule					
Otherwise (1)	ABC 123		Other		

Grouping

Trans 1998 table



Group By allows you to aggregate your data at a different level
(i.e. transform daily data into monthly, roll up transaction-level data by store, etc.)

	transaction_date	stock_date	product_id	transaction_id	store_id	quantity
1	8/11/1997	8/11/1997	2	2442	2	3
2	8/11/1997	8/11/1997	2	433	23	4
3	8/30/1997	8/30/1997	2	10340	27	7
4	1/7/1998	1/7/1998	2	4128	7	4
5	5/9/1997	5/9/1997	2	7504	2	7
6	11/20/1997	11/20/1997	2	2270	22	2
7	5/1/1997	4/28/1997	2	2322	2	2
8	8/12/1997	8/12/1997	2	8932	24	2
9	3/1/1997	3/1/1997	2	6006	17	2
10	11/11/1997	11/11/1997	2	2005	2	2
11	10/11/1997	10/11/1997	2	4707	22	2
12	8/16/1997	8/16/1997	2	8248	23	2
13	9/1/1997	9/2/1997	2	1344	24	2
14	10/29/1997	10/31/1997	2	257	24	2
15	8/11/1997	8/11/1997	2	3807	2	4
16	4/7/1997	4/7/1997	2	819	7	4
17	1/11/1997	1/6/1997	2	8188	23	7
18	10/1/1997	10/1/1997	2	8202	9	2
19	5/13/1997	5/18/1997	2	623	25	2
20	8/24/1997	8/29/1997	2	2089	23	4
21	10/16/1997	10/17/1997	2	2028	27	9
22	8/16/1997	8/16/1997	2	2829	23	2
23	4/16/1997	4/16/1997	2	4467	22	2

Group By

Specify the columns to group by:

Group by

product_id

Add grouping

New column name

Total_Quantity

Add aggregation

Operation

Sum

Column

quantity

OK

Cancel

	product_id	Total_Quantity
1	2	304
2	11	372
3	12	372
4	14	325
5	16	319
6	23	368
7	46	355
8	50	318
9	56	318
10	59	336
11	61	314
12	75	321
13	89	321
14	90	323
15	112	357
16	115	358
17	119	329
18	120	325
19	126	352
20	127	353
21	130	384
22	139	332
23	159	294

In this case we're transforming a daily, transaction-level table into a summary of "quantity" by "product_id"

Pivoting and Unpivoting data

Unpivoting

“**Pivoting**” is a fancy way to describe the process of turning **distinct row values** into **columns** (“*pivoting*”) or turning **columns** into **rows** (“*unpivoting*”)

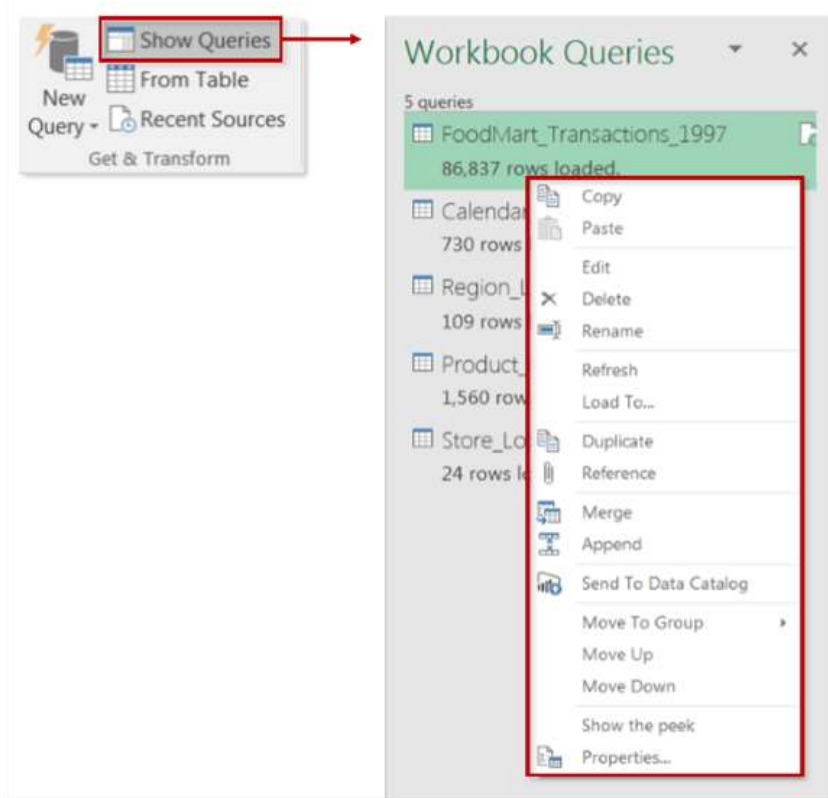
	1 ² ₃ 1990	1 ² ₃ 1991	1 ² ₃ 1992	1 ² ₃ 1993	1 ² ₃ 1994	1 ² ₃ 1995
1	25455	18081	26431	23721	16041	10576

	A ^B _C Year	1 ² ₃ Sales
1	1990	25455
2	1991	18081
3	1992	26431
4	1993	23721
5	1994	16041
6	1995	10576

Imagine that the table is on a hinge; pivoting is like rotating it from a **vertical** to a **horizontal** layout, and unpivoting is like rotating it from **horizontal** to **vertical**

NOTE: *Transpose* works very similarly, but doesn't recognize unique values; instead, the entire table is transformed so that each row becomes a column and vice versa

Edit Queries



Click on **Show Queries** to launch the **Workbook Queries** pane

Right-click any individual query to access common options and tools:

- **Edit** (launches the Query Editor)
- **Delete**
- **Rename**
- **Refresh**
- **Duplicate**
- **Merge**
- **Append**



Merge Queries

Tran table –Product Table

Merge Queries ▾

- Merge
- Append Queries ▾
- Combine Binaries

Combine

Select a table and matching columns to create a merged table.

FoodMart_Transactions_1997

date	product_id	customer_id	promotion_id	store_id	quantity	product_brand	product_name
1/1/1997	869	3449	0	6	5	Nationeel	Nationeel Grape I
1/2/1997	869	5476	0	13	2	Nationeel	Nationeel Grape I
1/3/1997	1	4728	501	7	4	Washington	Washington Berry
1/1/1997	1472	3449	0	6	3	Fort West	Fort West Fudge
1/6/1997	1472	3476	185	3	2	Fort West	Fort West Fudge

Product_Lookup

product_id	product_brand	product_name	product_sku	product_retail_price	product_cost
1	Washington	Washington Berry Juice	90748583674	2.85	0.94
2	Washington	Washington Mango Drink	96516502499	0.74	0.26
3	Washington	Washington Strawberry Drink	58427771925	0.83	0.4
4	Washington	Washington Cream Soda	64412155747	3.64	1.64
5	Washington	Washington Diet Soda	85561191439	2.19	0.77

Join Kind

Left Outer (all from first, matching from second) ▾

✓ The selection has matched 86837 out of the first 86837 rows.

OK Cancel

- Merging queries allows you to **join tables** based on a common column (like VLOOKUP)

TIP: Merging adds columns to an existing table

HEY THIS IS IMPORTANT!

Just because you *can* merge tables, doesn't mean you *should*.

In general, it's better to keep tables separate and define **relationships** between them (*more on that later!*)

Join Types: Left Outer (all from first , match from second)

Merge- left out

Product	Sales	Product	Sales Rep	Product	sales	Sales Rep
A	5445	A	Ali	A	5445	Ali
B	3432	B	Samy	B	3432	Samy
C	2133	C	Hany	C	2133	Hany
D	4321	D	Hosam	D	4321	Hosam
E	3564	E	Ramadan	E	3564	Ramadan
F	3214	G	Aymen	F	3214	
G	1123	S	Mark	G	1123	Aymen
S	3324	P	sameh	S	3324	Mark
O	5533	T	Ramy	O	5533	
P	2543			P	2543	sameh
T	3211			T	3211	Ramy

Join Types: Right Outer (all from second , match from first)

Merge- right out

Product	Sales	Product	Sales Rep	Product	sales	Sales Rep
A	5445	A	Ali	A	5445	Ali
B	3432	B	Samy	B	3432	Samy
C	2133	C	Hany	C	2133	Hany
D	4321	D	Hosam	D	4321	Hosam
E	3564	E	Ramadan	E	3564	Ramadan
G	1123	G	Aymen	G	1123	Aymen
S	3324	S	Mark	S	3324	Mark
P	2543	P	sameh	P	2543	sameh
T	3211	T	Ramy	T	3211	Ramy
			Ahmed			Ahmed
			Mostafa			Mostafa

Join Types: Full Outer (all rows from both)

Merge- Full Outer

Product	Sales	Product	Sales Rep	Product	sales	Sales Rep
A	5445	A	Ali	A	5445	Ali
B	3432	B	Samy	B	3432	Samy
C	2133	C	Hany	C	2133	Hany
D	4321	D	Hosam	D	4321	Hosam
E	3564	E	Ramadan	E	3564	Ramadan
F	3214	G	Aymen	F	3214	
G	1123	S	Mark	G	1123	Aymen
S	3324	P	sameh	S	3324	Mark
O	5533	T	Ramy	O	5533	
P	2543		Ahmed	P	2543	sameh
T	3211		Mostafa	T	3211	Ramy
						Ahmed
						Mostafa

Join Types: inner (only matches rows)

Merge- Inner

Product	Sales
A	5445
B	3432
C	2133
D	4321
E	3564
F	3214
G	1123
S	3324
O	5533
P	2543
T	3211

Product	Sales Rep
A	Ali
B	Samy
C	Hany
D	Hosam
E	Ramadan
G	Aymen
S	Mark
P	sameh
T	Ramy
	Ahmed
	Mostafa

Product	sales	Sales Rep
A	5445	Ali
B	3432	Samy
C	2133	Hany
D	4321	Hosam
E	3564	Ramadan
G	1123	Aymen
S	3324	Mark
P	2543	sameh
T	3211	Ramy

Join Types: Left Anti (Rows Only in First)

Merge- Left Anti

Product	Sales	Product	Sales Rep	Product	sales	Sales Rep
A	5445	A	Ali	F	3214	
B	3432	B	Samy	O	5533	
C	2133	C	Hany			
D	4321	D	Hosam			
E	3564	E	Ramadan			
F	3214	G	Aymen			
G	1123	S	Mark			
S	3324	P	sameh			
O	5533	T	Ramy			
P	2543					
T	3211					

Join Types: Right Anti (Rows Only in second)

Merge- Left Anti

Product	Sales	Product	sales Rep	Product	sales	Sales Rep
A	5445	A	Ali			Ahmed
B	3432	B	Samy			Mostafa
C	2133	C	Hany			
D	4321	D	Hosam			
E	3564	E	Ramadan			
G	1123	G	Aymen			
S	3324	S	Mark			
P	2543	P	sameh			
T	3211	T	Ramy			
			Ahmed			
			Mostafa			

Appending

Append sheet 5 –locations

Trans 2018 -2017

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Tips : Appending add rows to the table
Vs. Merge add column to the table
Taller Vs Wider



Thank You