

Week 3 – Business Analytics Fundamentals – Sydney Campus



- 1. Summary of Lecture 2**
- 2. Tutorial Week 3**
- 3. Key assessment dates**
- 4. Attendance & Tutorial Questions - Recognising student participation and engagement specifically identifying those who are most actively involved!**

Lecturer/Tutor: Dr. Farshid Keivanian

Key assessment dates: Ask Questions and give me 1 week to reply: FKeivanian@my.holmes.edu.au



Key Assessment Dates

ASSESSMENT	DUE DATE	DUE TIME	LENGTH
Online Quizzes x 4	Refer assessment folder	9.00 pm	15 minutes once test is accessed
Group Case Study	2 June, 2024	11.59 pm	Refer to assignment instructions

ASSESSMENT	DATE	START TIME	DURATION
Final Assessment	TBC	TBC	TBC

Please refer to the assessment folders below for full details regarding submission requirements and times



Online Quizzes Information

ASSESSMENT	QUIZ DATE	QUIZ AVAILABLE
Quiz 1	14 April, 2024	6.00 am – 9.00 pm
Quiz 2	28 April, 2024	6.00 am – 9.00 pm
Quiz 3	12 May, 2024	6.00 am – 9.00 pm
Quiz 4	26 May, 2024	6.00 am – 9.00 pm

Key assessment dates: Ask Questions and give me 1 week to reply: FKeivanian@my.holmes.edu.au

 **Group Case Study Information** 

DUE DATE	2 June, 2024
DUE TIME	11.59 pm

This folder contains information about the **Group Case Study** that forms part of the assessment for this unit. Information includes **instructions to join a group**, detailed assignment requirements and submission link.

 **Final Assessment Information** 

Availability: Item is hidden from students.

This folder contains information about the **Final Assessment** and includes detailed assessment specifications, submission requirements and submission link.

Please note that the assessment and submission link is only available during the period listed above.

The submission link will not be available once the time expires therefore it is strongly recommended you allow yourself sufficient time to complete the assessment prior to the link closing.

If you do not have internet access or if your connection is poor, it is your responsibility to seek out another source such as a public library, internet café, etc., to submit your assessment within the required time.

No late submissions are allowed.

1. Summary of Lecture 2



- In lecture week 2 of the HI6037 Fundamentals of Business Analytics course, the importance of business analytics in driving informed business decisions was emphasized. The lecture outlined the business analytics process, defining it as a continual, iterative exploration of past business performance to drive future business planning. The lecture noted that although abundant information exists, it often doesn't translate into actionable intelligence for decision-makers. This is underscored by a Gartner Research finding from 2007, which noted that only 36% of CEOs believe their management teams use the right information to run their businesses effectively.

1. Summary of Lecture 2: A Practical Example in Australia

- A practical example in the Australian context might be the transformation story of an Australian retail company that utilized business analytics to optimize its inventory management. After consistently facing issues with overstocking and stockouts, the company identified this as a critical business issue. By formulating specific questions around optimal stock levels and examining historical sales data, the company was able to refine its inventory purchase strategy, leading to improved availability of products and cost savings.
- The lecture continued to illustrate how Continental Airlines moved from being unprofitable in the early '90s to a leader in the industry by the mid-'90s, driven by a data-centric approach that offered a single view of the customer and the business. The process of identifying business issues, formulating questions, gathering and analyzing information, and then taking actions based on the insights was explored as a cyclical process contributing to this turnaround.

1. Summary of Lecture 2: A Practical Example in Australia

- In summary, business analytics is crucial for understanding and enhancing business performance. By leveraging data, companies can make informed decisions that lead to improved operations and competitive advantage. The lecture underscored the necessity of aligning the business analytics process with corporate strategy to ensure that actions taken are in service of the broader organizational goals.

2. Tutorial Week 3: Introduction to Business Analytics – Foundational Concepts to Understand

The tutorial week 3 document is centered around an introduction and tutorial for using Microsoft Power BI for data visualization and analysis. It assumes some familiarity with the foundational concepts as it guides through applying them in practical exercises using Power BI. We will be exploring an explanation of each concept with practical examples:

1. Business Analytics: It's the application of skills, technologies, and practices for continuous iterative exploration and investigation of past business performance to gain insight and drive business planning.

Example: An Australian retail company analyzes historical sales data to forecast inventory needs for the upcoming season.

2. Tutorial Week 3: Introduction to Business Analytics – Foundational Concepts to Understand

2. Information vs Intelligence: Differentiating between mere data collection (information) and actionable insights (intelligence). **Example:** An Australian logistics company collects GPS tracking data (information) and uses it to optimize delivery routes (intelligence).

3. Business Analytics Process: Involves steps from identifying issues to evaluating results. **Example:** An Australian healthcare provider uses patient data to identify treatment success rates and areas for improvement.

4. Data Acquisition and Management: Evolution from simple data collection to sophisticated data mining. **Example:** An Australian bank employs advanced data mining techniques to detect fraudulent transactions.

2. Tutorial Week 3: Introduction to Business Analytics – Foundational Concepts to Understand

5. OLTP vs OLAP: Knowing the difference between transactional systems (OLTP) and analytical systems (OLAP). Understanding these systems' roles in operational and analytical phases is crucial. **Example:** An Australian e-commerce platform uses OLTP for daily transactions and OLAP for analyzing customer buying patterns.

6. Data Warehousing: Understanding what a data warehouse is and its significance. Basic knowledge is essential. **Example:** An Australian telecommunications company uses a data warehouse to integrate data from various sources for analysis.

Practical Example: Using business analytics in an Australian retail chain to improve stock management and sales strategies. The chain could use historical sales data, customer feedback, and market trends analyzed through a business analytics process involving Power BI to forecast demand, optimize inventory levels, and tailor marketing campaigns, thereby reducing costs and increasing revenue.

2. Tutorial Week 3: Understanding the Datasets

- Location.xlsx
- This Excel file contains geographical information useful for linking sales data with specific locations within the retail chain. Here's what each column represents:
- **City:** Contains codes representing various cities where the stores are located.
- **State #:** Lists numerical codes for states correlating to the city codes.
- **Description:** Provides the descriptive name of each city linked to the city codes.
- For geographic analysis or demographic studies, we use Location.xlsx

A	B	C	D
1	City	State #	Description
2	CT212	8050456	GILLETTE
3	CT486	8050456	RAWLINS
4	CT498	8050456	ROCK SPRINGS
5	CT49	8050453	BELLINGHAM
6	CT65	8050453	BOTHELL
7	CT284	8050453	KENT
8	CT291	8050453	KIRKLAND
9	CT331	8050453	LYNNWOOD
10	CT427	8050453	OLYMPIA
11	CT433	8050453	OTHELLO
12	CT470	8050453	PORT ANGELES
13	CT491	8050453	RENTON
14	CT537	8050453	SEATTLE
15	CT557	8050453	SPOKANE
16	CT634	8050453	YAKIMA
17	CT299	8050449	LA VERKIN
18	CT351	8050449	MEADOW
19	CT525	8050449	SANDY
20	CT32	8050448	AUSTIN
21	CT43	8050448	BEAUMONT
22	CT76	8050448	BRYAN
23	CT110	8050448	CLEVELAND
24	CT120	8050448	CONROE
25	CT131	8050448	DALLAS
26	CT137	8050448	DAYTON

2. Tutorial Week 3: Understanding the Datasets



- W3 Uluru Goods.xlsx
- This file offers a comprehensive look at the sales performance of Uluru Goods across various stores. Detailed fields include:
 - **Order_ID:** Unique identifier for each order placed.
 - **Date:** The date each order was made (in Excel date format, which can be converted to a standard date).
 - **Store_ID** and **Store_desc:** Identifier and description of the store where the order was placed.
 - **Longitude** and **Latitude:** Geographic coordinates of the store, useful for spatial analysis.
 - **City_ID** and **City_desc:** Links to the geographical location file for matching store locations with city details.
 - **Cat_ID** and **Category:** Category identifier and description, which categorize the products sold.
 - **Product_ID** and **Prod_desc:** Details of the individual products sold.
 - **Price, Quantity_Sold, Original_Sales_Price, Discount_Percent, Discount, Sales_Revenue, Gross_Margin:** All pertain to the pricing, sales volume, discounts given, revenues generated, and margins on products sold. For sales performance, we use 'W4 Uluru Goods.xlsx' which contains sales data.

2. Tutorial Week 3: Using the Data with Power BI



- Data Integration and Analysis
- **Query Editor:** First, use the Query Editor in Power BI to import and cleanse the data from both Excel files. This involves tasks such as changing column names to more meaningful ones, converting data types appropriately, and removing unnecessary rows or columns.
- **Data Modelling:** Combine data from the two Excel files by linking them via common identifiers like city codes or store IDs. This is crucial for performing comprehensive analyses that incorporate location-based insights.
- **Data Visualization:** After modeling, use Power BI to create visualizations. For instance, sales performance can be visualized geographically, or trends over time can be analyzed through line graphs or bar charts.

Each of these topics is elaborated on, particularly focusing on how to prepare, transform, and model the data using various Power BI tools, making the content quite comprehensive in addressing the processes of handling and visualizing data in Power BI.

2. Tutorial Week 3: Practical Exercise

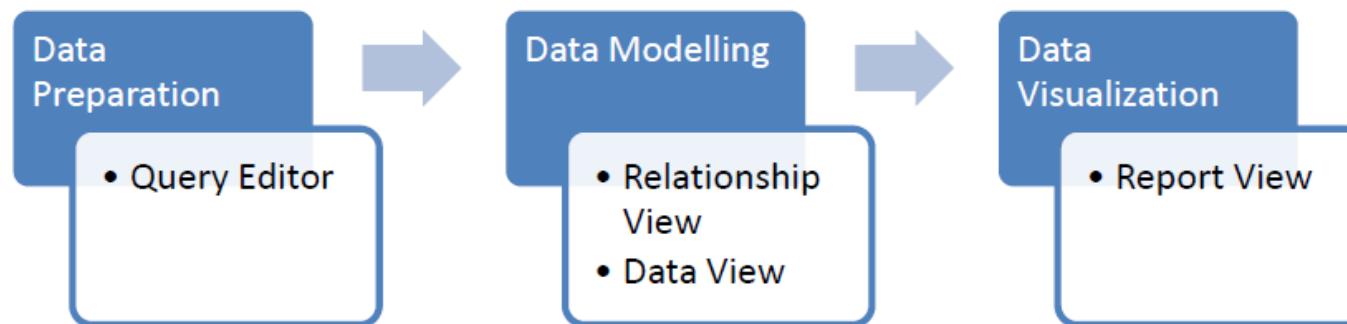
- **Forecasting and Optimization:** Use historical sales data to forecast future demands, using Power BI's forecasting tools. This aligns with the Microsoft Power BI document's scenario of using Power BI to analyze sales revenues and costs, aiming to enhance the business analytics environment of a company.
- Overall, the provided Microsoft Power BI document serves as an introduction to using Power BI for data manipulation and visualization. It is more geared towards foundational skills in handling and visualizing data rather than advanced analytical applications.

2. Tutorial Week 3: Power BI Desktop components



Power BI Desktop

Power BI Desktop has a number of components that can be used to acquire, transform, visualise and analyse data. These include:



- **Query Editor**, where you can connect to one or many data sources, transform the data to meet your needs, then load that model into Power BI Desktop
- **Data View** – see the data in your report in data model format. You can add measures, create new columns, and manage relationships
- **Relationships View** – Used to create relationships between the datasets defined in *Data view*. Power BI Desktop attempts to identify the relationships automatically, but a user can also define them manually
- **Report view**: A canvas for building and viewing reports based on the datasets defined in *Data View*.

2. Tutorial Week 3: Dataset

We will be using each of the components throughout the various tutorials.



Scenario - Data Set



Company History

Uluru Goods is an American based company sells apparel, groceries, household, hardware and camping equipment throughout America. Due to several tax and export issues, Uluru Goods headquarters is located in Philadelphia and has warehouses for shipping in both San Diego and Miami. San Diego handles West Coast distribution

2. Tutorial Week 3: Dataset

while Miami handles East Coast distribution. The company would like a business analytics environment to get a better understanding of their sales revenues and costs for various products and product categories.



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Products

As mentioned previously Uluru Goods sells apparel, groceries, household, hardware and camping equipment. The range of products includes:

Product Category	Product
Apparel	Rain Jacket
	Gloves
	Boots
Grocery	Water
	Beef Jerky
Household	Bucket
	Mop
	Hammer
	Nails
Camping	Tarp
	Canteen

2. Tutorial Week 3: Dataset



Data Set

The data supplied records the sales of products for each store. The data dictionary is below:

Field	Data Type	Description
Actuals	Text	Version of data
Order_ID	Number	Unique identifier of orders
Date	Date	Date of order
Store_ID	Text	Unique identifier of store
Store_desc	Text	Name of store
Longitude	Number	Longitude of store
Latitude	Number	Latitude
City_ID	Text	Unique identifier of City where store is located

Goals

The purpose of this tutorial is to introduce students to the analytical capabilities of Microsoft Power Bi. Students will define and create an analytical data model based on a provided data set. This model will then be used to explore the data to answer a number of queries. The model will also form the basis for a series of visualisations and dashboards.

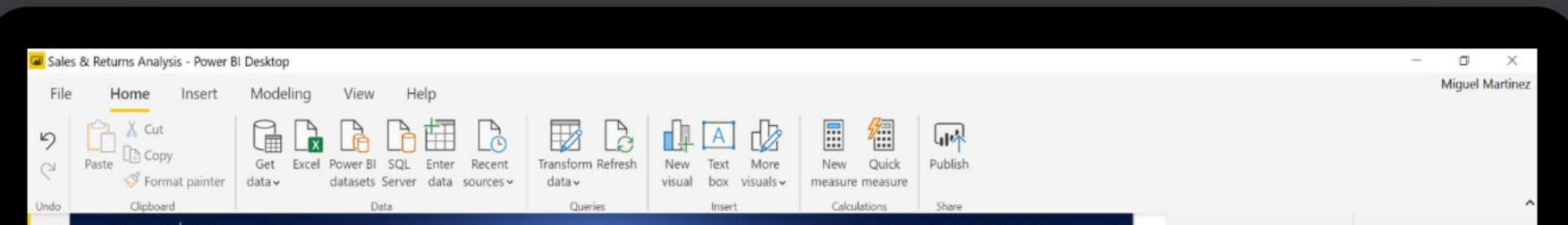
<https://powerbi.microsoft.com/en-us/desktop/>

Go from data to insight to action with Power BI Desktop

Create rich, interactive reports with visual analytics at your
fingertips—for free.

[Download free >](#)

[See download or language options >](#)



2. Tutorial Week 3: Installation

Microsoft Store

Search apps, games, movies, and more

Screenshots

Power BI Desktop

Microsoft Corporation

4.7 ★ 504

Average Ratings

Business

IARC 3+ 3+

Description

Power BI Desktop puts visual analytics at your fingertips. With this powerful authoring tool, you can create interactive data visualizations and reports.

Connect, mash up and model, and visualize your data. Place visuals exactly where you want them, analyze and explore your data, and share content with your team by publishing to the Power BI web service.

Power BI Desktop is part of the Power BI product suite. Use Power BI Desktop to create and

Home

Apps

Gaming

Arcade

Entertainment

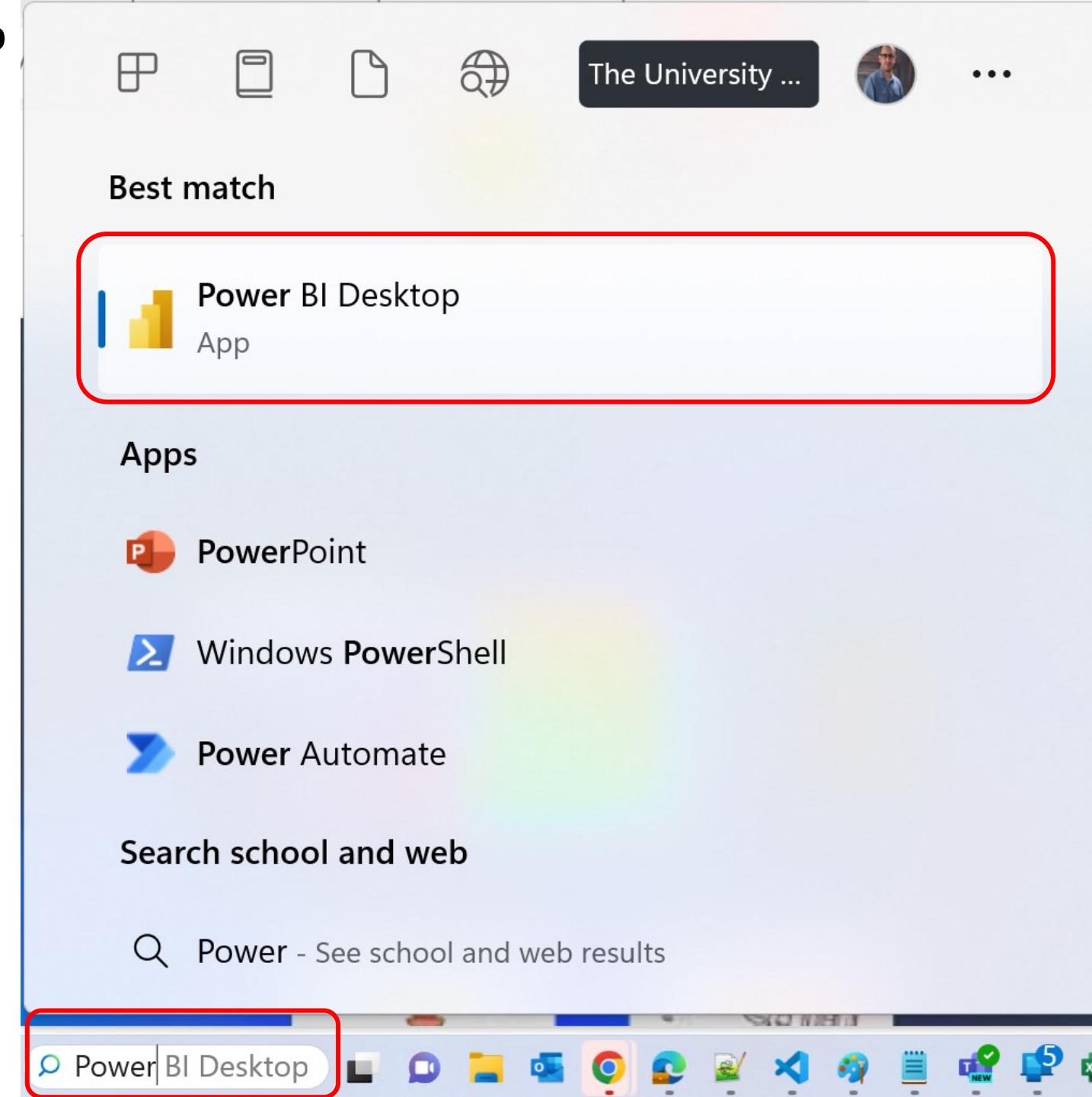
AI Hub

What's New

Library

Help

2. Tutorial Week 3: Running Power BI Desktop



2. Tutorial Week 3: Get Data



Untitled - Power BI Desktop



Search

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Home



Open

Save

Save as

Share

Get data

Import

Export

Open

Recent

OneDrive

Browse this device



Find recently opened reports here

Once you've opened some Power BI content, come back to Recents to find it again easily.

Publish

2. Tutorial Week 3: Get Data

The screenshot shows the Power BI Desktop interface with the title bar "Untitled - Power BI Desktop". The "Home" tab is selected in the ribbon. A red box highlights the "Get data" button in the "Data" section of the ribbon. Another red box highlights the "Get data" option in the expanded "Actions" menu. A third red box highlights the "Excel workbook" option under the "Common data sources" section. The right side of the screen displays a "Sensitivity" and "Data" pane.

Get Data

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File Home Insert Modeling Actions

Get data >

Common data sources

Get data Examples Refresh Transform data Refresh visuals Help

Get help with "Get Data"

Clipboard Data

Get data

Excel workbook OneLake data hub SQL Server

Power BI semantic models Dataflows Dataverse

SQL Server Analysis Services Text/CSV Web

Import data from Excel

Page 1 +

32%

2. Tutorial Week 3: Get Excel Document



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Sessions X Content X Bb 2658

https://holmes.blac...

2024-T1-HI6037: Business Analytics Fundamentals Tutorial Materials Week 3

Week 3

Build Content Assessments Tools Partner Content

W3 Power BI tutorial-Importing Data

W3 Uluru Goods.xlsx

Location.xlsx

Need help with Study Skills?
Workshops are occurring on each campus.
Online: [Click here to access the online Study Skills resource](#)

Browser: Mon Apr 15 2024 21:27:24 GMT+1000 (Australian Eastern Standard Time)

utor > W3 Search W3

Name	Date modified	Type
Location	15/04/2024 04:38	Microsoft Excel
W3 Uluru Goods	15/04/2024 04:38	Microsoft Excel

W3 Uluru Goods

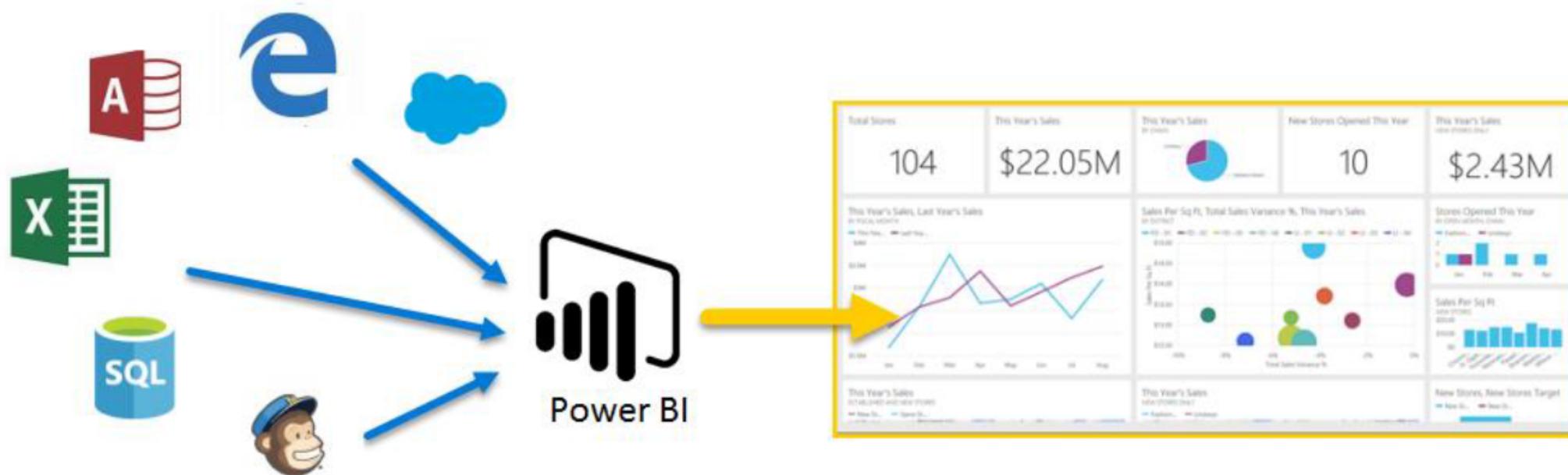
Excel Files (*.xl;*.xlsx;*.xlsm;*.xlst

Open Cancel



Getting Data

As mentioned previously Power BI can be connected to multiple data sources including Microsoft Excel and Access files, text files, and online services such as Salesforce, Microsoft Dynamics, and Azure Storage. For the purpose of this exercise you will acquire data from Microsoft Excel.



2. Tutorial Week 3: Open Query Editor by Selecting Load (Or Edit older versions)



Navigator

Display Options ▾

W3 Uluru Goods.xlsx [1]

- Transactions

Suggested Tables [1]

- Table 1 (Transactions)

Table 1 (Transactions)

Version	Order_ID	Date	Store_ID	Store_desc
Actuals	1	42579	ST278	Wanget (WAN4)
Actuals	2	42579	ST246	Yummy Foods (YF6)
Actuals	3	42579	ST350	Texi-mart (TEXI8)
Actuals	4	42579	ST1047	Alfredsons (Alf4)
Actuals	5	42578	ST223	Yummy Foods (YF3)
Actuals	6	42640	ST522	Wakefields (WA9)
Actuals	7	42609	ST281	Good Foods (GF6)
Actuals	8	42577	ST456	Asadi Emporium (AE4)
Actuals	9	42577	ST380	Eiffel Expo (EE5)
Actuals	10	42607	ST1021	Miller Center (MC1)
Actuals	11	42576	ST358	CommNet International (Com
Actuals	12	42576	ST200	Eiland Foods (EFL4)

Load

Transform Data

Cancel

2. Tutorial Week 3: Select Load in New Version or Edit in Older Version – for Query Editor in Next

The screenshot shows the Power BI Desktop interface with the following details:

- Top Bar:** Untitled - Power BI Desktop, Search, Farshid Keivanian.
- Home Tab:** Selected. Contains icons for Paste, Get data (with dropdown for Excel workbook, OneLake data hub, and SQL Server), Enter data, Transform, Refresh, New visual, Text box, More, New measure, Quick measure, Sensitivity, and Calculations.
- Clipboard:** Shows a warning message: "⚠ There are pending changes. Save now?"
- Load Dialog Box:** A modal window titled "Load" is open, showing the status: "Transactions Loading data to model...". It has a "Cancel" button.
- Bottom Bar:** Page 1, a green plus sign icon, and various visualization icons for Py, R, and other languages.

2. Tutorial Week 3: Use Power Query Editor



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Untitled - Power BI Desktop Search Farshid Keivani

File Home Help Table tools Share ▾

Paste Get data ▾ SQL Server Enter data OneLake data hub ▾ Dataverse Recent sources ▾ Transform data ▾ Refresh Manage relationships New measure Quick measure New column New table Manage roles Calculations Security ▾

Clipboard Data

⚠ There are pending changes in your report. Use the Power Query editor to connect, prepare, and transform data.

ULURU GOODS SALES Column2 Column3 Column4 Column5

	Column2	Column3	Column4	Column5
Actuals	211	42560	ST33	Creative Images LLC (CI23)
Actuals	407	42545	ST343	Texi-mart (TEXI5)
Actuals	549	42623	ST338	Texi-mart (TEXI2)
Actuals	567	42529	ST342	Texi-mart (TEXI4)
Actuals	726	42635	ST333	Laura J's (LJ6)
Actuals	732	42512	ST215	Killam Mart (KM8)
Actuals	991	42486	ST332	Laura J's (LJ5)
Actuals	1056	42479	ST86	ETK Mart (ETK17)

Data Transactions

Data Preparation

- Query Editor

Query Editor

The Query Editor enables a user to prepare the data. You can make changes to the data, such as changing a data type, removing columns, or combining data from multiple sources. However, these changes do not affect the original source files.

The Query Editor screen has a number of components that you should become familiar with.

2. Tutorial Week 3: Use Power Query Editor



Often when data is loaded it is not suitable for analysis due to its structure and format. You can transform the data to prepare it for analysis. You do this before it is loaded it into a Data Model for analysis.

	A ^B _C ULURU GOODS SALES	ABC 123 Column2	ABC 123 Column3
1	Version	Order_ID	Date
2	Actuals		1
3	Actuals		2
4	Actuals		3
5	Actuals		4
6	Actuals		5
7	Actuals		6
8	Actuals		7
9	Actuals		8
10	Actuals		9
11	Actuals		10
12	Actuals		11

2. Tutorial Week 3: Use the First Row as the Headers



Left Click on Table Symbol >> Use First Row as Headers

As the first row (line #1) contains more appropriate column headings, we need to use this first row (line #1) as headers.

Queries [2]

Transactions ULURU GOODS SALES ABC 123 Column2

A^BC Query1

= Table.TransformColumnTypes(#"Promoted")

Order_ID Date

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	

Copy Entire Table

Use First Row as Headers (highlighted with a red box)

Add Custom Column...

Add Column From Examples...

Invoke Custom Function...

Add Conditional Column...

Add Index Column

Choose Columns...

Keep Top Rows...

Keep Bottom Rows...

Keep Range of Rows...

Keep Duplicates

Keep Errors

Remove Top Rows...

Remove Bottom Rows...

Remove Alternate Rows...

Remove Errors

Merge Queries...

Append Queries...

2. Tutorial Week 3: Use the First Row as the Headers

See Applied Steps

The screenshot shows the Power BI Query Editor interface. On the left, there's a sidebar with 'Queries [2]' containing 'Transactions' and 'Query1'. The main area displays a table with three columns: 'Version', 'Order_ID', and 'Date'. The 'Version' column contains 13 rows labeled 'Actuals'. The 'Order_ID' and 'Date' columns each have one row with the value '1'. Below the table, it says '0 COLUMNS, 999+ ROWS' and 'Column profiling based on top 1000 rows'. To the right of the table is a 'Query Settings' pane. Under the 'APPLIED STEPS' section, a red box highlights several steps: 'Source', 'Navigation', 'Promoted Headers', 'Changed Type', 'Promoted Headers1', and 'Changed Type1'. At the bottom right of the editor, it says 'PREVIEW DOWNLOADED AT 21:33'.

Each of the steps we perform in transforming data is recorded by Query Editor, and each time this query connects to the data source those steps are carried out so that the data is always shaped the way we specified.

2. Tutorial Week 3: Make Column Headings More Meaningful

Rename Some Columns

Prod_desc → Product

= Table.TransformColumnTypes(#"Promoted"

	Product_ID	Prod_desc
1	DS75	Nails
2	DS72	Bucket
3	DS64	Water
4	DS89	Tarp
5	DS72	Bucket
6	DS54	Gloves
7	DS54	Gloves
8	DS56	Boots
9	DS51	Rain Jacket
10	DS56	Boots
11	DS77	Nails
12	DS75	Nails
13	DS54	Gloves

A B C Product L.2 Price

Nails	
Bucket	
Water	
Tarp	
Bucket	
Gloves	
Gloves	
Boots	
Rain Jacket	
Boots	
Nails	
Nails	
Gloves	

All Properties

APPLIED STEPS

- Source
- Navigation
- Promoted Headers
- Changed Type
- Promoted Headers1
- Changed Type1
- Renamed Columns**

APPLIED STEPS

Source

Navigation

Promoted Headers

Changed Type

Promoted Headers1

Changed Type1

2. Tutorial Week 3: Make Column Headings More Meaningful

Rename Some Columns

- Store_desc --> Store
- City_Desc --> City
- Quantity_Sold --> Quantity Sold
- Original_Sales_Price --> Sales Revenue
- Discount_Percent --> Discount %
- Discount --> Discount \$
- Sales_Revenue --> Discounted Sales Revenue
- Gross_Margin --> Profit

	1.2 Discount %	1.2 Discounted Sales Revenue
4	0.11	0.3498
5	0.28	261.072
6	0.08	14.72
7	0.07	0.3885
8	0.06	14.184
9	0.23	1.426
10	0.14	0.413
11	<	>

2. Tutorial Week 3: Make Column Headings More Meaningful

Remove Columns

- Store_ID
- City_ID
- Cat_ID

Choose Remove Keep Remove Split Group 1 2 Replace Values
Columns Columns Rows Rows Column By Transform
Manage Columns Reduce Rows Sort
Combine Files Combine

table.RenameColumns(#"Changed Type1", { })

Store_ID	Category
42579	ST1047
42578	ST223
42640	ST522
42609	ST281
42577	ST456
42577	ST380
42607	ST1021
42576	ST358
42576	ST399
42638	ST340
42575	ST898
42575	ST937
42575	ST172

The screenshot shows a Power BI desktop interface. A context menu is open over the 'Store_ID' column header. The 'Remove' option in the menu is highlighted with a red box. The menu also includes other options like 'Copy', 'Remove Other Columns', 'Duplicate Column', 'Add Column From Examples...', 'Remove Duplicates', 'Remove Errors', 'Change Type', 'Transform', 'Replace Values...', 'Replace Errors...', 'Split Column', 'Group By...', 'Fill', 'Unpivot Columns', 'Unpivot Other Columns', 'Unpivot Only Selected Columns', 'Rename...', 'Move', 'Drill Down', and 'Add as New Query'. The background shows a table with columns 'Store_ID' and 'Category'.

2. Tutorial Week 3: Change Data Type

- When you load data into Power BI it will attempt to convert the data type of the source column into a data type that better supports more efficient storage, calculations, and data analysis. The data types in Power BI are:
 - If you review your data set you will realise that incorrect data types have been applied. For example, Date column. The

Text:

Decimal Number:

Whole Number:

= Table.RemoveColumns(#"Renamed Columns", {"Store_ID", "Category", "Sub-Category", "Unit Price", "Quantity Sold", "Total Cost", "Profit Margin", "Last Purchase Date", "Last Sale Date", "Days Since Last Purchase", "Days Since Last Sale", "Days Since Last Purchase & Sale", "Days Since Last Purchase or Sale", "Days Since Last Purchase & Sale (Days)", "Days Since Last Purchase or Sale (Days)"})

ABC	Product	Number	Quantity Sold
	Nails	3.69	
	Bucket	3.59	
	Water	3.33	
	Tarp	3.18	
	Bucket	3.33	
	Gloves	2.3	
	Gloves	5.55	
	Boots	3.94	
	Rain Jacket	3.1	
	Boots	2.95	
	Nails	4.1	
	Nails	2.65	

2. Tutorial Week 3: Change Data Type

- **Left Click on Current Data Type**

For example) Find 'Date' Column, then left click on its current data type, and choose 'Date'

The screenshot shows the Power Query Editor interface. At the top, there are buttons for 'Query', 'Manage Columns', 'Reduce Rows', and 'Sort'. Below the buttons, a formula bar displays the code: `= Table.RemoveColumns(#"`. To the right of the formula bar is a column header labeled 'Date' with a dropdown arrow. A red box highlights this header. A context menu is open over the 'Date' header, listing various data types: Decimal Number, Fixed decimal number, Whole Number, Percentage, Date/Time, Date, Time, Date/Time/Timezone, Duration, Text, True/False, Binary, and Using Locale... The 'Date' option is highlighted with a red box and has a green arrow pointing to it from the right side of the screen. The main table area shows several rows of data, with the 'Date' column containing dates like '28/07/2016' and '27/07/2016'. The entire screenshot is enclosed in a large red border.

	Date	Customer
1	123	Warren
2	42579	Yum
3	42579	Texi
4	42579	Alfre
5	42578	Yum
6	42640	Wak
7	42609	Goo
8	42577	Asad
9	42577	Eiffe
10	42607	Mille
11	42576	Com
12	42576	Ekel
42	42638	Texi

2. Tutorial Week 3: Change Data Type

- **Left Click on Current Data Type**

For example) Find ‘Price’ Column, then left click on its current data type, and choose ‘Fixed decimal number’

The screenshot shows a spreadsheet interface with a context menu open over the 'Price' column header. The menu lists various data types, with '\$ Fixed decimal number' highlighted by a red box. A large green arrow points from the bottom right towards the menu, indicating the direction of the action. The data in the 'Price' column is shown as follows:

Price
3.69
3.59
3.33
3.18
3.33
2.3
5.55
3.94
3.1
2.95
4.1
2.65
2.81

2. Tutorial Week 3: Change Data Type

- **Left Click on Current Data Type**

For example) Find ‘Sales Revenue’

Column, then

left click on its current data type, and
choose ‘Fixed decimal number’

The screenshot shows a data editor interface with two columns. The left column displays the 'Sales Revenue' data, and the right column shows the same data after applying a new data type. A context menu is open over the first row of the left column, with the option '\$ Fixed decimal number' highlighted. A large green arrow points from the right side of the menu towards the right column.

Sales Revenue	\$ Sales Revenue
1.2 Decimal Number	7.38
\$ Fixed decimal number	753.90
123 Whole Number	9.99
% Percentage	3.18
Date/Time	932.40
Date	184.00
Time	5.55
Date/Time/Timezone	236.40
Duration	6.20
Text	2.95
True/False	20.50
Binary	254.40
Using Locale...	

2. Tutorial Week 3: Change Data Type

- **Left Click on Current Data Type**

For example) Find ‘Discount %’ Column,

then

left click on its current data type, and
choose ‘Percent’

The screenshot shows a data editor interface. On the left, a dropdown menu is open over a column header labeled '1.2 Discount %'. The menu is titled '1.2' and lists various data types: Decimal Number, Fixed decimal number, Whole Number, Percentage, Date/Time, Date, Time, Date/Time/Timezone, Duration, Text, True/False, Binary, and Using Locale...'. The 'Percentage' option is highlighted with a red box. To the right of the menu, the data table has a header '% Discount %'. The first row contains the value '1.741' under the original column and '174.17%' under the new column. A large green arrow points from the 'Percentage' option in the dropdown to the new '% Discount %' column header.

%	Discount %
1.741	174.17%
158.3	15831.90%
2.89	289.71%
0.34	34.98%
261.0	26107.20%
14.	1472.00%
0.38	38.85%
14.1	1418.40%
1.4	142.60%
0.4	41.30%

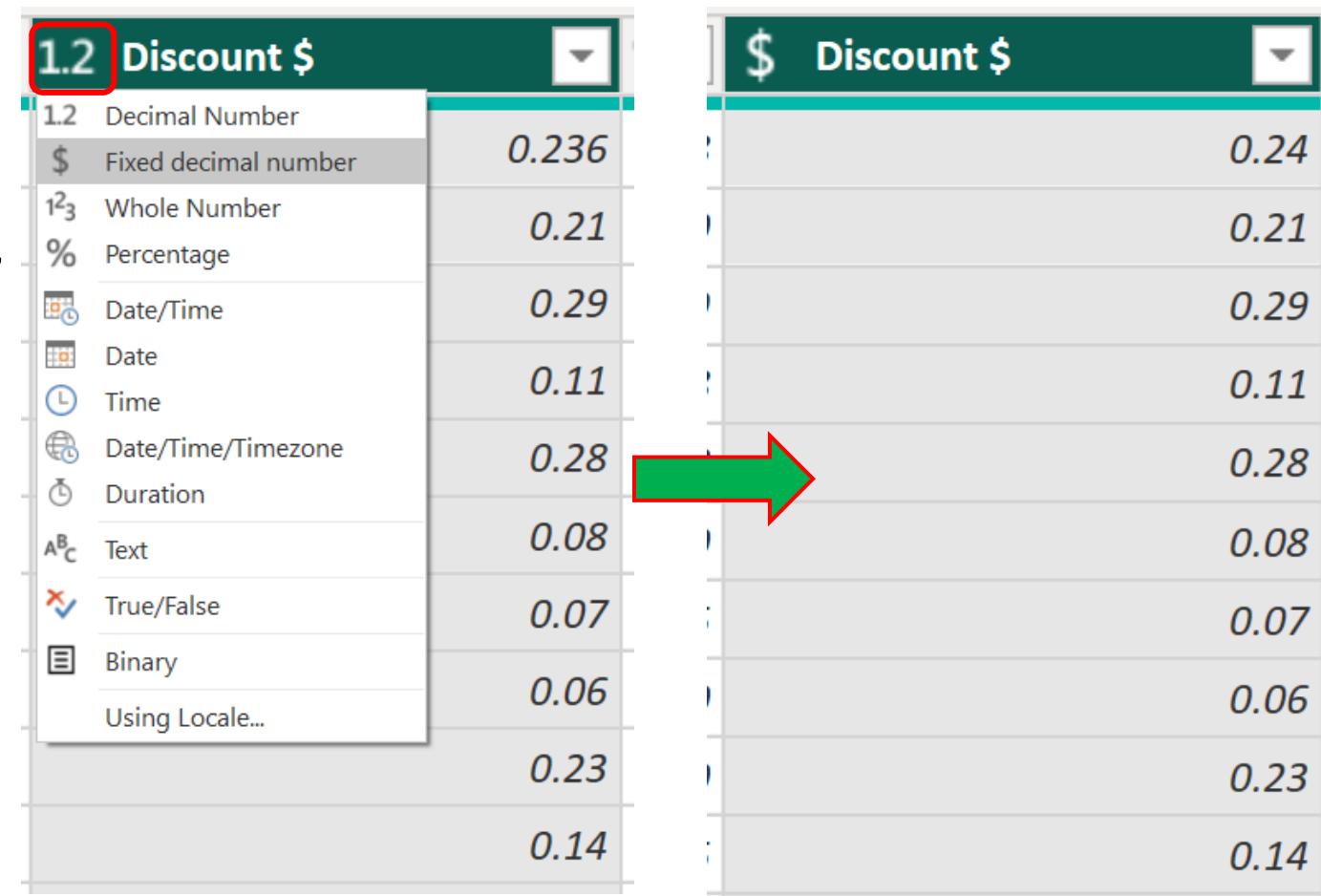
2. Tutorial Week 3: Change Data Type

- **Left Click on Current Data Type**

For example) Find ‘Discount \$’ Column,

then

left click on its current data type, and
choose ‘Fixed Decimal’



2. Tutorial Week 3: Change Data Type

- **Left Click on Current Data Type**

For example) Find ‘Discounted Sales Revenue’ Column, then left click on its current data type, and choose ‘Fixed Decimal’

The screenshot illustrates the process of changing the data type for the 'Discounted Sales Revenue' column. On the left, a context menu is open over the column header, with the option 'Fixed decimal number' highlighted. A red box highlights the column header '1.2 Discounted Sales Revenue'. A green arrow points from the 'Fixed decimal number' option in the menu to the same option in the adjacent table on the right, which shows the results after the change.

\$	Discounted Sales Revenue
	5.64
	595.58
	7.09
	2.83
	671.33
	169.28
	5.16
	222.22
	4.77
	2.54
	19.57
	229.98

2. Tutorial Week 3: Change Data Type

- **Left Click on Current Data Type**

For example) Find ‘Profit’ Column, then left click on its current data type, and choose ‘Fixed Decimal Number’

The screenshot shows a data editor interface. On the left, a dropdown menu is open over the 'Profit' column header, which is currently set to '1.2'. The dropdown menu lists various data types: Decimal Number, Fixed decimal number, Whole Number, Percentage, Date/Time, Date, Time, Date/Time/Timezone, Duration, Text, True/False, Binary, and Using Locale... The 'Fixed decimal number' option is highlighted with a red box. To the right of the dropdown, the 'Profit' column contains numerical values. A green arrow points from the dropdown menu towards the right side of the screen, indicating the transformation of the data type. The right side of the image shows the resulting data where the values are now displayed with a dollar sign (\$) and two decimal places.

Profit	1.2
98948495	1.2
7.1152822	1.2
69794268	1.2
77827683	1.2
3.6347175	1.2
73984569	1.2
29235909	1.2
02746571	1.2
1.819505909	1.2
0.865001248	1.2

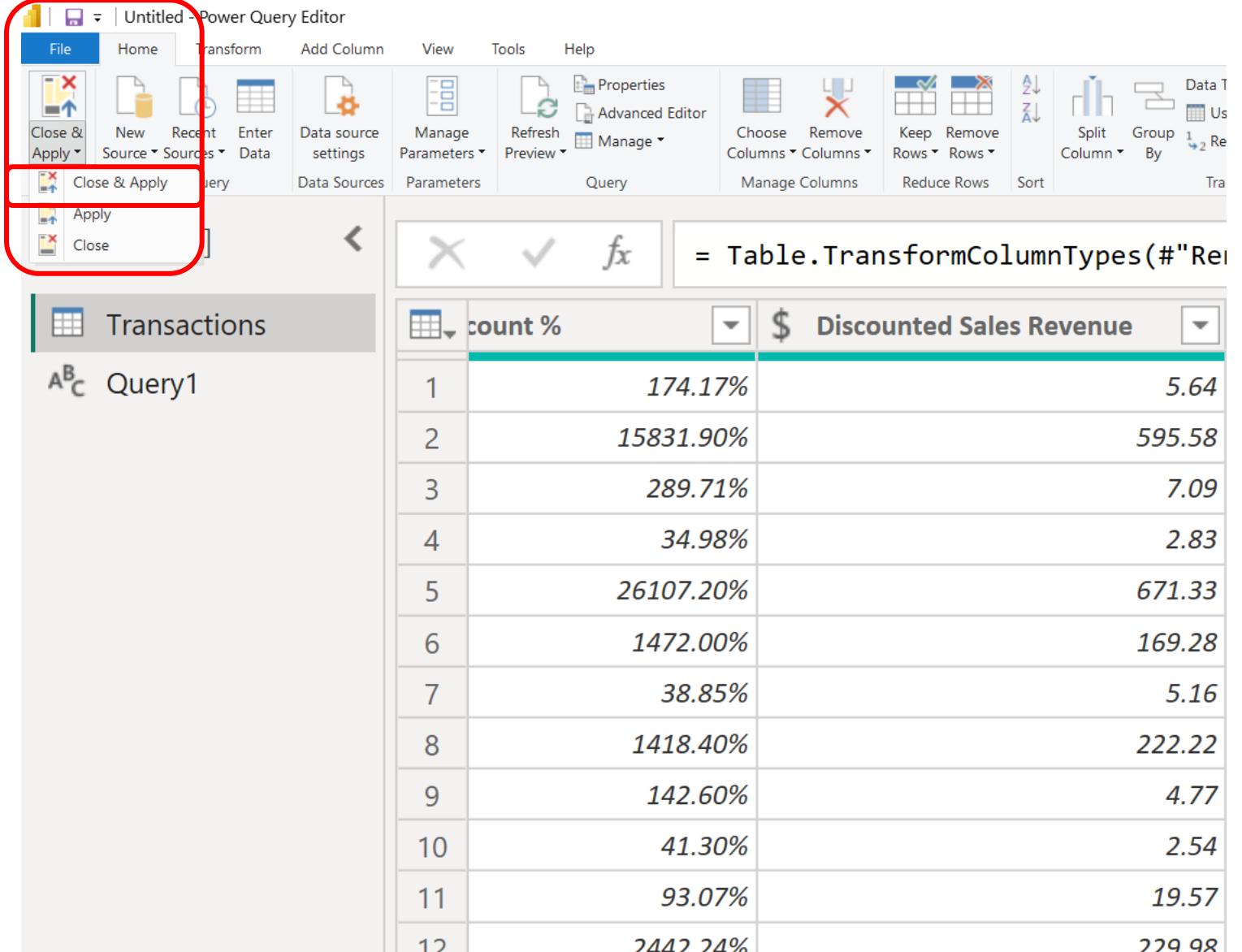
Profit	\$
1.30	
137.12	
2.70	
1.08	
248.63	
62.74	
2.43	
69.03	
1.82	
0.87	
4.51	
94.54	
1.17	

2. Tutorial Week 3: Saving

- **Close & Apply**

The saving process will close the Query

Editor and applies the changes to the
data model into Power BI Desktop

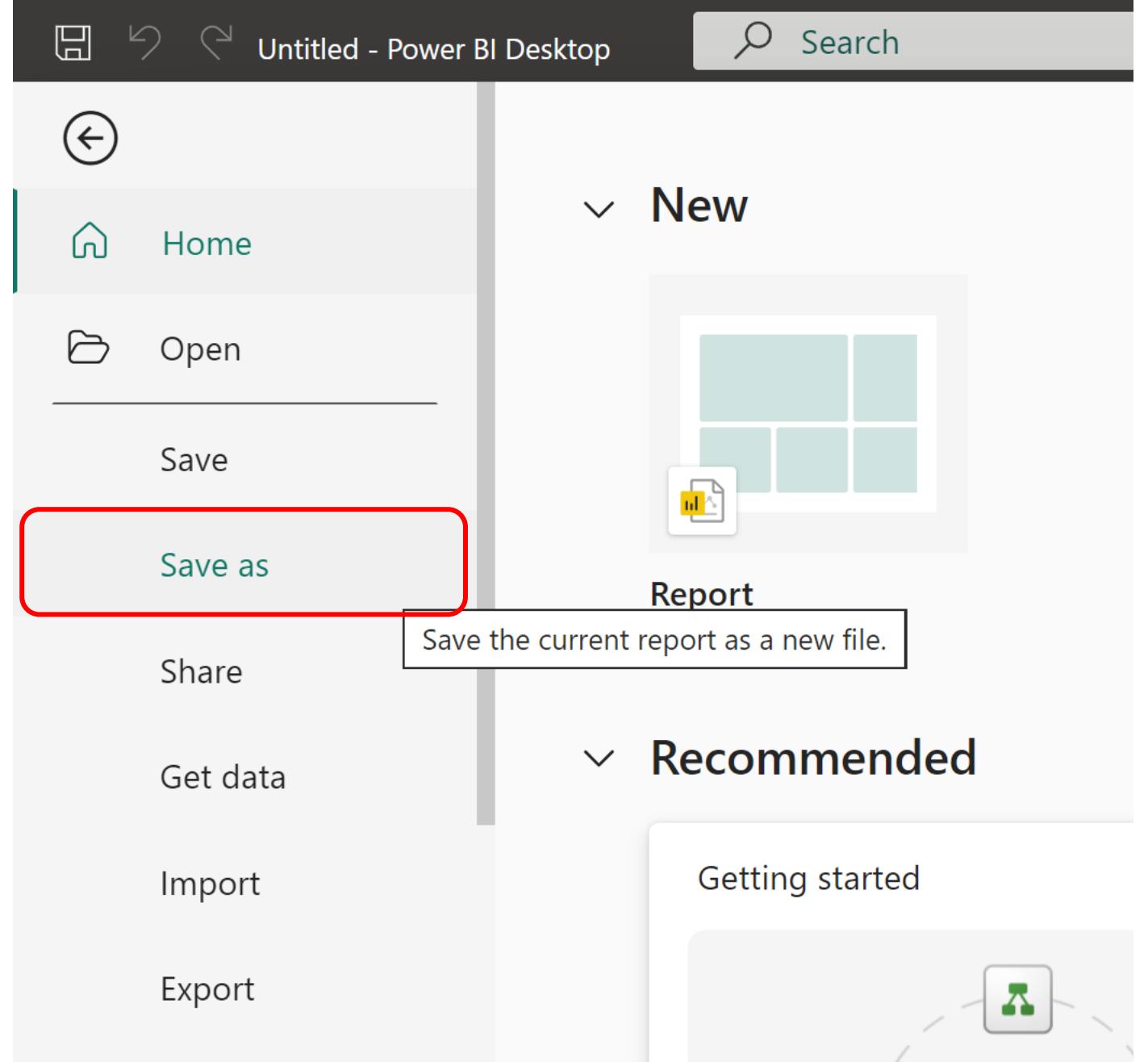


The screenshot shows the Power Query Editor interface. The top ribbon has tabs for File, Home, Transform, Add Column, View, Tools, and Help. The 'File' tab is selected. A red box highlights the 'Close & Apply' button in the 'File' tab's ribbon. Below the ribbon, there are two rows of buttons: 'Close & Apply' (highlighted), 'Apply', and 'Close'. The main area shows a table titled 'Transactions' with a query named 'Query1'. The formula bar at the top right shows '= Table.TransformColumnTypes(#"Re...". The table has three columns: 'count %' (values 174.17%, 15831.90%, etc.), '\$ Discounted Sales Revenue' (values 5.64, 595.58, etc.), and a third column with values 7.09, 2.83, etc. The bottom right corner of the table shows '12' and '229.98'.

	count %	\$ Discounted Sales Revenue
1	174.17%	5.64
2	15831.90%	595.58
3	289.71%	7.09
4	34.98%	2.83
5	26107.20%	671.33
6	1472.00%	169.28
7	38.85%	5.16
8	1418.40%	222.22
9	142.60%	4.77
10	41.30%	2.54
11	93.07%	19.57
12	2442.24%	229.98

2. Tutorial Week 3: Saving

- **Save As**
 - Choose the name 'Tutor Week 3.pbix'
 - Remember the location you save the file



2. Tutorial Week 3: Saving

- **Save As**

- Choose the name 'Tutor

- Week 3.pbix'

- Remember the location

- you save the file

The screenshot shows the Microsoft Power BI desktop interface. The ribbon menu at the top includes tabs for File, Home, Help, and Table tools. The Home tab is selected. The Data section of the ribbon contains options like Excel workbook, Enter data, Get data, OneLake data hub, Dataverse, SQL Server, Recent sources, Transform, Refresh data, Manage relationships, New measure, New column, New table, and Calculations. The main area displays a data grid with columns: Version, Order_ID, Date, Store, and Longitude. A tooltip is visible over the 'Longitude' column header, showing the formula: Name 'Transactions'[Category]. The data grid contains several rows of transaction data. To the right of the grid, the Data pane is open, showing the structure of the 'Transactions' table with columns for Category, City, Date, Discount %, Discount \$, and Discounted Sales Revenue.

Version	Order_ID	Date	Store	Longitude
Actuals	310	Sunday, 30 October 2016	iChannel (iCH10)	-71.1036819
Actuals	372	Tuesday, 28 June 2016	Alfredsons (Alf32)	40.70941658
Actuals	573	Tuesday, 7 June 2016	Finnys (Finn16)	40.71474749
Actuals	776	Monday, 16 May 2016	Forage (FORA6)	40.71474749
Actuals	1041	Thursday, 21 April 2016	Texi-mart	40.71474749
Actuals	1110	Tuesday, 13 September 2016	German Imports (GI3)	43.04173217
Actuals	1131	Monday, 11 April 2016	Vancity (VAN4)	-72.1139672
Actuals	1229	Thursday, 31 March 2016	Texi-mart (TEXI6)	40.71398196
Actuals	1418	Sunday, 20 March 2016	AMAF Supply Inc (AMAF8)	-104.6173481

2. Tutorial Week 3: See Report View

- **See Visualisation Tools**
- For further analysis, we need to get geographical information useful for linking sales data with specific locations (City, State, and Region)

The screenshot shows the Microsoft Power BI desktop application interface. The top navigation bar includes 'File', 'Home' (selected), 'Insert', 'Modeling', 'View', 'Optimize', and 'Help'. The 'Home' tab has options like 'Clipboard' (Paste, Get data from), 'Data' (Excel workbook, OneLake data hub, SQL Server, Recent sources), 'Queries' (Transform, Refresh data), 'Insert' (New visual, Text box, More visuals), and 'Calculations' (New measure, Quick measure, Sensitivity). The main area is titled 'Report view' and contains a 'Build visual' section with a 'Search' bar and a 'DAX' button. To the right are sections for 'Filters' (Search, Add data fields here) and 'Visualizations' (a grid of visualization icons including bar charts, line graphs, and maps). A 'Data' pane on the far right lists 'Query1' and 'Transactions'. The bottom of the screen shows a page navigation bar with 'Page 1' highlighted.

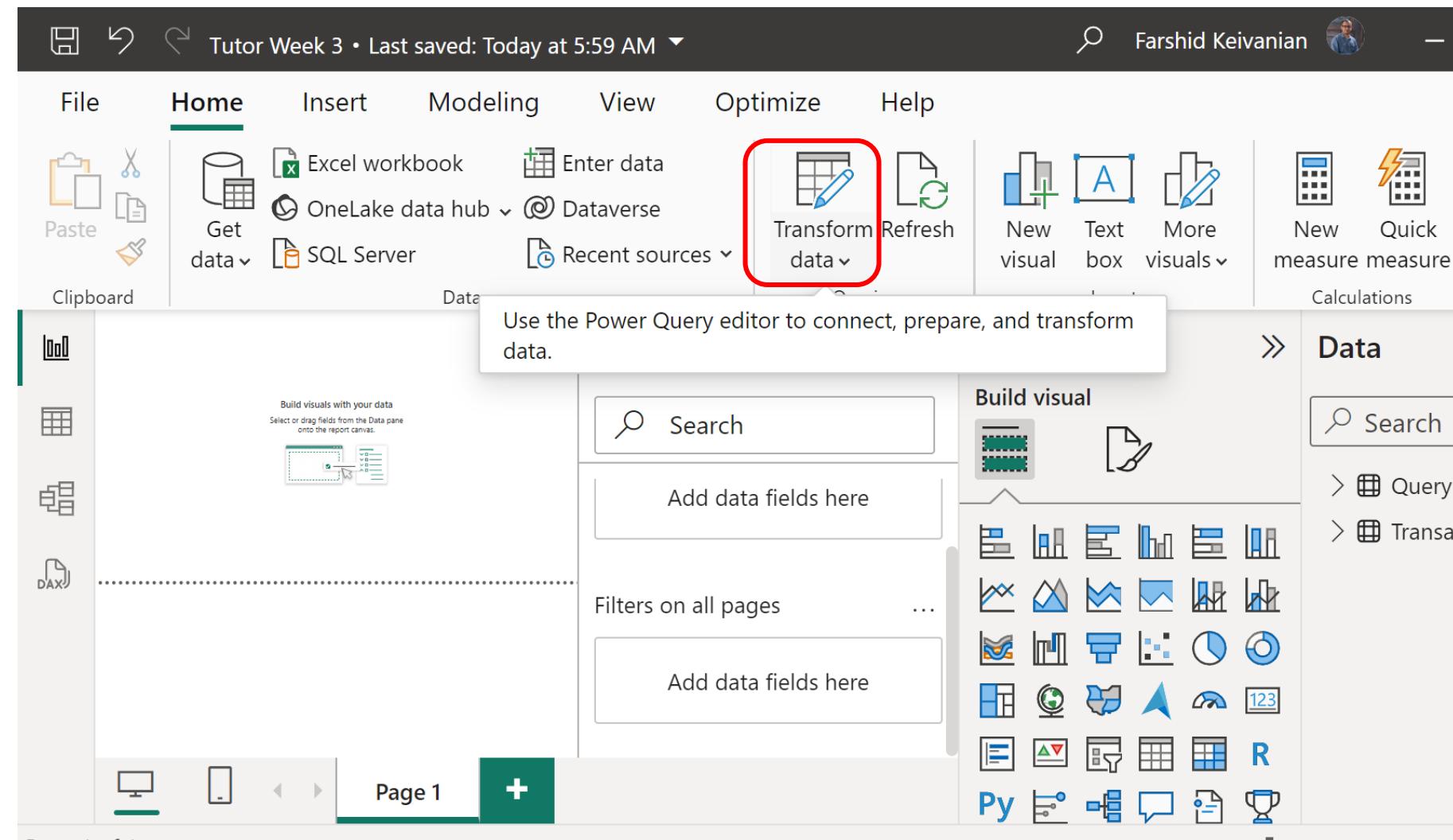
2. Tutorial Week 3: See Report View

- **See Visualisation Tools**
- For further analysis, we need to get geographical information useful for linking sales data with specific locations (City, State, and Region)

The screenshot shows the Microsoft Power BI desktop application interface. The top navigation bar includes 'File', 'Home' (selected), 'Insert', 'Modeling', 'View', 'Optimize', and 'Help'. The 'Home' tab has options like 'Clipboard' (Paste, Get data from), 'Data' (Excel workbook, OneLake data hub, SQL Server, Recent sources), 'Queries' (Transform, Refresh data), 'Insert' (New visual, Text box, More visuals), and 'Calculations' (New measure, Quick measure, Sensitivity). The main area is titled 'Report view' and contains a 'Build visual' section with a grid icon and a 'Search' bar. To the right are sections for 'Filters' (Search, Add data fields here) and 'Visualizations' (Build visual, a large grid of visualization icons including charts, maps, and tables). At the bottom, there are page navigation controls ('Page 1 of 1', 'Page 1', '+') and a zoom slider set at 20%.

2. Tutorial Week 3: Acquire Additional Data

- Select **Transform data**
- We need to use **Power Query Editor** to acquire additional data



2. Tutorial Week 3: Acquire Additional Data

- Select Transform data
- We need to use Power Query Editor to acquire additional data

The screenshot shows the Microsoft Power BI Query Editor interface. The title bar says "TUTOR WEEK 3". The ribbon menu includes File, Home, Transform, Add Column, View, Tools, and Help. The Home tab is selected. The toolbar contains icons for Close & Apply, New Source, Recent Sources, Enter Data, Data source settings, Manage Parameters, Refresh Preview, Properties, Advanced Editor, and Manage. The main area displays a table with two columns: "Version" and "Order_ID". The "Version" column contains the value "Actuals" for all rows. The "Order_ID" column contains values 1 through 13. The formula bar at the top right shows the formula: = Table.TransformColumnTypes(#"Renamed"). The "Transactions" query is selected in the Queries list on the left. The "Query Settings" pane on the right shows the query name is "Transactions" and lists applied steps including "Changed Type", "Promoted Headers1", "Changed Type1", "Renamed Columns", "Removed Columns", "Changed Type2", "Renamed Columns1", and "Changed Type3".

Version	Order_ID
Actuals	1
Actuals	2
Actuals	3
Actuals	4
Actuals	5
Actuals	6
Actuals	7
Actuals	8
Actuals	9
Actuals	10
Actuals	11
Actuals	12
Actuals	42

Properties

Name: Transactions

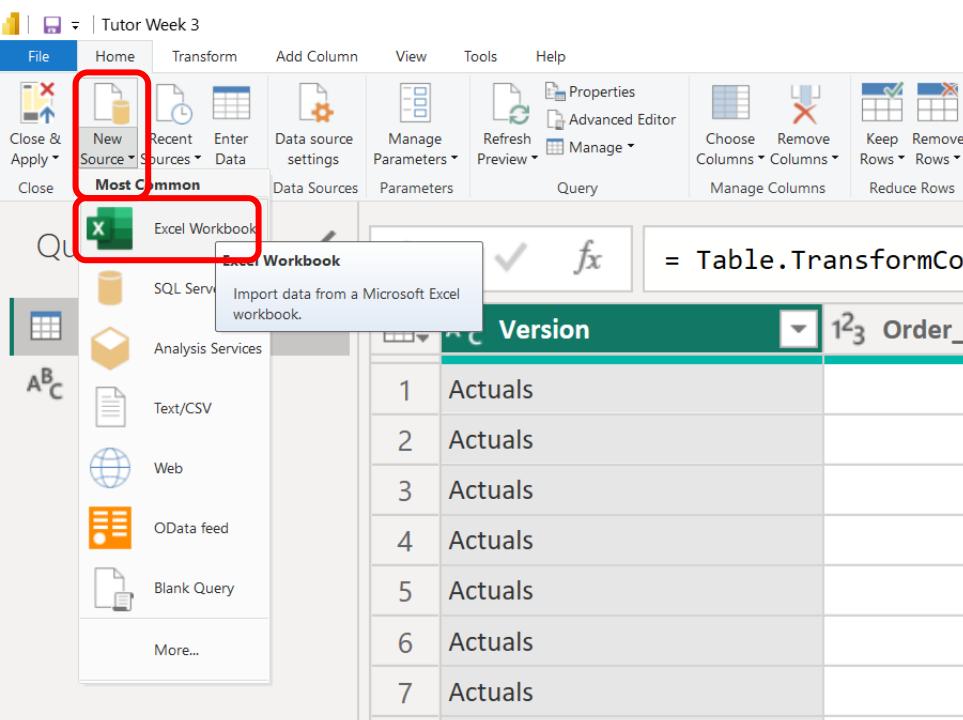
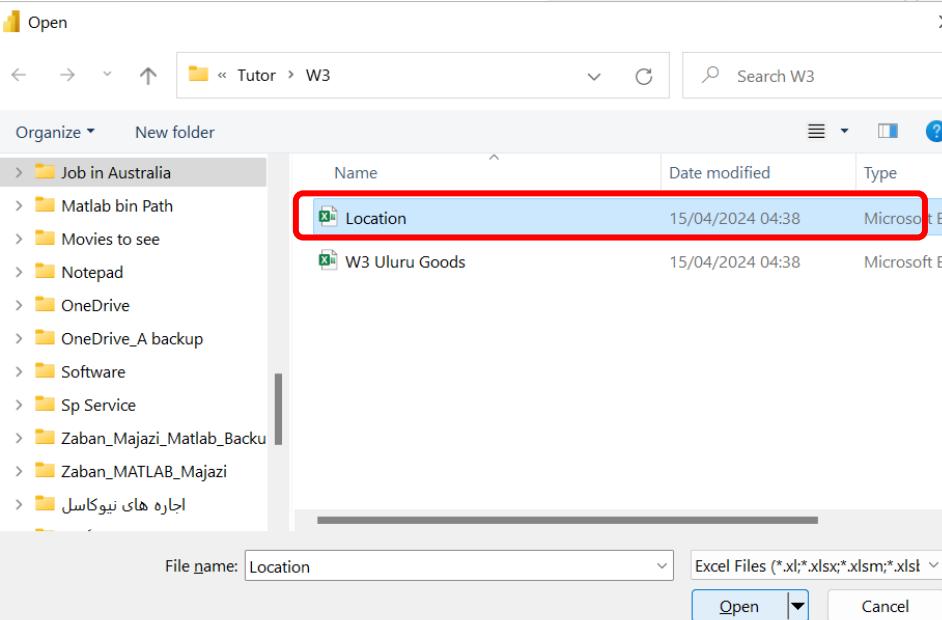
All Properties

Applied Steps

- Changed Type
- Promoted Headers1
- Changed Type1
- Renamed Columns
- Removed Columns
- Changed Type2
- Renamed Columns1
- Changed Type3

2. Tutorial Week 3: Acquire Additional Data

- Select New Source
- We need to navigate to the Location document



A screenshot of a learning management system interface. On the left, a sidebar shows course navigation for '2024-T1-HI6037: Business Analytics Fundamentals'. The main content area displays a card titled 'W3 Power BI tutorial-Importing Data'. On the right, a file list shows 'W3 Uluru Goods.xlsx' and 'Location.xlsx', with 'Location.xlsx' highlighted with a red box.

2. Tutorial Week 3: Acquire Additional Data

Navigator

Display Options ▾

- Location.xlsx [3]
 - Region
 - State
 - State & Region

Suggested Tables [3]

- City (State)
- Table 2 (State & Region)

State & Region

State #	Region #	State
8050456	80502	Wyoming
8050453	80502	Washington
8050449	80502	Utah
8050448	80506	Texas
8050441	80502	Oregon
8050440	80506	Oklahoma
8050435	80506	New Mexico
8050432	80502	Nevada
8050430	80502	Montana
8050416	80502	Idaho
8050408	80502	Colorado
8050406	80502	California

OK

Cancel

2. Tutorial Week 3: Acquire Additional Data

The worksheets have been added to the Query Editor.

The screenshot shows the Microsoft Power Query Editor interface. The ribbon menu at the top includes File, Home, Transform, Add Column, View, Tools, and Help. The Home tab is selected. The toolbar below the ribbon contains various icons for file operations, data sources, parameters, and query transformations. The main area displays a list of 'Queries [5]' on the left, with a red box highlighting the 'Transactions' and 'State & Region' entries. The central workspace shows a table with three columns: 'State #' (containing values 1 through 13), 'Region #' (containing values 8050456 through 8050404), and 'State' (containing state names: Wyoming, Washington, Utah, Texas, Oregon, Oklahoma, New Mexico, Nevada, Montana, Idaho, Colorado, California, Arizona). The table has a green header row. The 'Query Settings' pane on the right shows the 'Properties' section with the name 'State & Region' and the 'Applied Steps' section, which includes 'Source', 'Navigation', 'Promoted Headers', and 'Changed Type' (the last step is highlighted).

Queries [5]

- Transactions
- Query1
- Region
- State
- State & Region

= Table.TransformColumnTypes(#"Promoted"

	State #	Region #	State
1	8050456	80502	Wyoming
2	8050453	80502	Washington
3	8050449	80502	Utah
4	8050448	80506	Texas
5	8050441	80502	Oregon
6	8050440	80506	Oklahoma
7	8050435	80506	New Mexico
8	8050432	80502	Nevada
9	8050430	80502	Montana
10	8050416	80502	Idaho
11	8050408	80502	Colorado
12	8050406	80502	California
13	8050404	80506	Arizona

Query Settings

PROPERTIES

Name: State & Region

All Properties

APPLIED STEPS

- Source
- Navigation
- Promoted Headers
- Changed Type

2. Tutorial Week 3: Select Region

You will notice that many of the rows contain null values. Null values indicate that the rows contain no data. These should be removed

The screenshot shows the Microsoft Power BI Data Editor interface. The title bar says "Tutor Week 3". The ribbon menu includes File, Home, Transform, Add Column, View, Tools, Help, and various data management and transformation tools. On the left, the "Queries [5]" pane lists "Transactions", "Query1" (which is selected and highlighted with a red box), "Region", "State", and "State & Region". The main workspace displays a table with two columns: "Region #" and "Region". The table has 14 rows. Rows 7 through 14 are highlighted with a red box. The table data is as follows:

	Region #	Region
1	80501	New England
2	80502	West
3	80503	Atlantic
4	80504	South
5	80505	Midwest
6	80506	Southwest
7	null	null
8	null	null
9	null	null
10	null	null
11	null	null
12	null	null
13	null	null
14	null	null

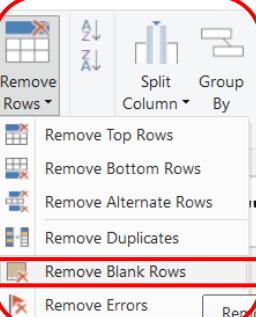
The "Query Settings" pane on the right shows the query name is "Region". The "APPLIED STEPS" section lists "Source", "Navigation", "Promoted Headers", and "Changed Type" (which is currently selected).

2. Tutorial Week 3: Select Region

Tutor Week 3

File Home Transform Add Column View Tools Help

Close & Apply New Source Sources Enter Data Data source settings Manage Parameters Refresh Preview Advanced Editor Properties Choose Columns Remove Columns Keep Rows Reduce Rows Split Column Group By Data Type: Whole Number Use First Row as Headers Replace Values Merge Queries Append Queries Combine Files Text Analytics Vision Combine Files Azure Machine Learning AI Insights

Close New Query Data Sources Parameters Query Manage Columns Transform Queries [5]  Promoted

Transactions Query1 Region State State & Region

= Table.Transform

Region #

	Region #	Region
1	80501	New England
2	80502	West
3	80503	Atlantic
4	80504	South
5	80505	Midwest
6	80506	Southwest
7	null	null
8	null	null
9	null	null
10	null	null
11	null	null
12	null	null
13	null	null
14	null	null

Remove Blank Rows Remove Errors Remove all blank rows from this table.

Query Settings

PROPERTIES

Name: Region

All Properties

APPLIED STEPS

Source, Navigation, Promoted Headers, Changed Type

2 COLUMNS. 639 ROWS Column profiling based on top 1000 rows PREVIEW DOWNLOADED AT 06:24

2. Tutorial Week 3: Remove Null Values from Region

The screenshot shows the Power Query Editor interface. On the left, there is a navigation pane with items like 'Regions' and 'Region'. The main area displays a table with two columns: 'Region #' and 'Region'. The 'Region #' column contains numerical values from 1 to 6, and the 'Region' column contains categorical names: 'New England', 'West', 'Atlantic', 'South', 'Midwest', and 'Southwest'. Above the table, the formula bar shows the query code: `= Table.SelectRows(#"Changed Type", each`. The status bar on the right indicates '1 row(s) found'.

Region #	Region
1	New England
2	West
3	Atlantic
4	South
5	Midwest
6	Southwest

2. Tutorial Week 3: Select State (City) and remove Null values

Select State & Region
(State #) and remove Null
values (blank rows)

The screenshot shows the Microsoft Power BI Data Editor interface. The top navigation bar includes Home, Transform, Add Column, View, Tools, and Help. The Transform ribbon tab is selected, showing various data manipulation tools like New, Recent, Enter, Data source settings, Manage Parameters, Refresh, Advanced Editor, Properties, Choose Columns, Remove Columns, Keep Rows, Remove Rows, Split Column, Group By, Data Type (set to Whole Number), Merge Queries, Append Queries, Combine Files, and AI Insights.

The left sidebar lists 'Queries [5]' with 'Transactions', 'Query1', 'Region', 'State', and 'State & Region' selected. The main area displays a table titled 'Table.Transform' with two columns: 'State #' and 'Region'. The data consists of 13 rows:

	State #	Region
1	8050456	
2	8050453	80502 Washington
3	8050449	80502 Utah
4	8050448	80506 Texas
5	8050441	80502 Oregon
6	8050440	80506 Oklahoma
7	8050435	80506 New Mexico
8	8050432	80502 Nevada
9	8050430	80502 Montana
10	8050416	80502 Idaho
11	8050408	80502 Colorado
12	8050406	80502 California
13	8050404	80506 Arizona

A context menu is open over the first row, specifically over the 'State #' column cell. The menu path is 'Transform' > 'Remove Rows' > 'Remove Blank Rows'. A tooltip for this option states: 'Remove all blank rows from this table.'

The 'Properties' pane on the right shows the query name 'State & Region' and other properties. The 'Applied Steps' pane at the bottom lists the steps taken: Source, Navigation, Promoted Headers, and Changed Type (the last step is highlighted).

2. Tutorial Week 3: Adding Custom Columns

Uluru Goods wants to track the costs of goods in each order where products are sold.

Currently there is no column containing this data however it can be calculated from the other data available. A new column needs to be created which contains the cost of goods for each order. This is calculated by:

$(\text{Discount Revenue} - \text{Profit}) / \text{Quantity Sold}$

The screenshot shows the Microsoft Power BI Data Editor interface. The ribbon at the top has 'Home' selected. In the 'Transform' tab, the 'Custom Column' icon is highlighted with a red box. The main area shows a table with three columns: 'Version' (containing 'Actuals'), 'Order_ID' (containing numbers 1 through 13), and 'Date' (containing a single value '42'). To the left, a sidebar lists queries: 'Transactions' (selected), 'Query1', 'Region', 'State', and 'State & Region'. On the right, the 'Query Settings' pane is open, showing the 'PROPERTIES' section with 'Name' set to 'Transactions' and the 'APPLIED STEPS' section listing several transformation steps. The 'Custom Column' dialog box is open, prompting to 'Create a new column in this table, based on a custom formula.' The formula bar shows the formula: `= Table.TransformColumnTypes(#"Renamed", {{"Order_ID", type number}})`.

2. Tutorial Week 3: Adding Formula

We will use the Custom Column. In the Query Editor you can create custom formulas that operate on multiple columns in your table, then place the result of such formulas into a new (custom) column. The formulas are created using the Power Query Formula Language (M Formula).

Add a column that is computed from the other columns.

New column name

Custom column formula [①](#)

```
= ([Discounted Sales Revenue] - [Profit])/[Quantity Sold]
```

Available columns

- Quantity Sold
- Sales Revenue
- Discount \$
- Discount %
- Discounted Sales Revenue
- Profit
- Cost of Goods

New Column will be shown here

<< Insert

Learn about Power Query formulas

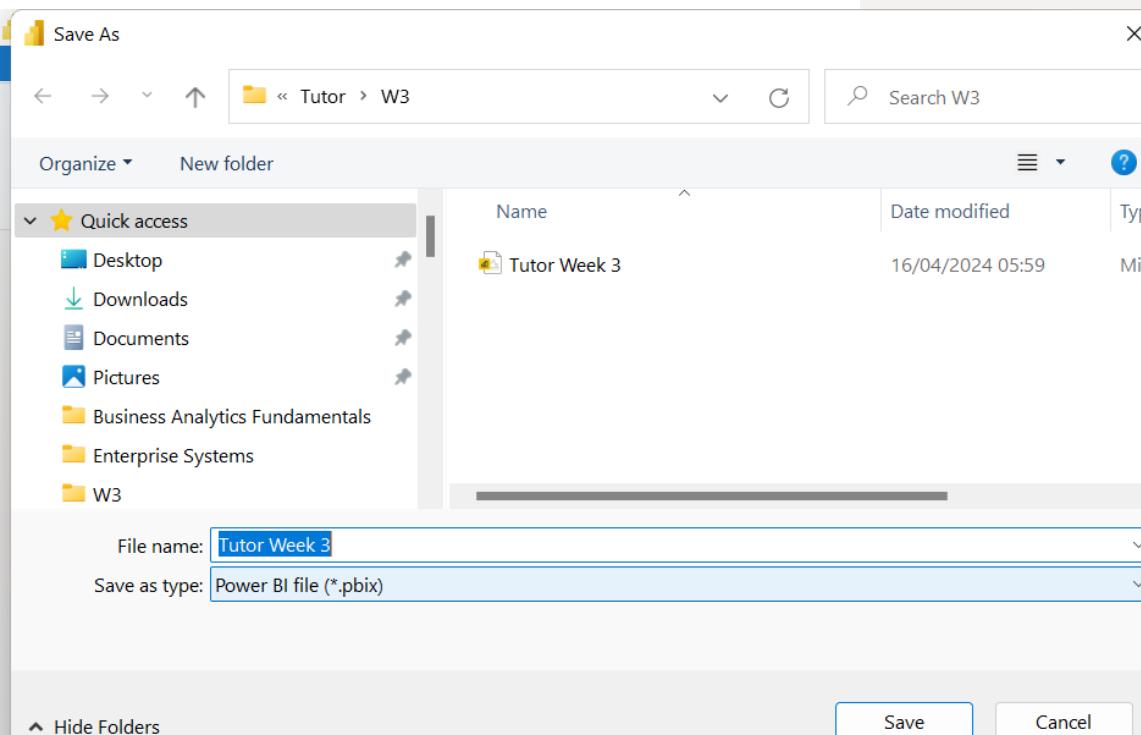
✓ No syntax errors have been detected.

OK Cancel

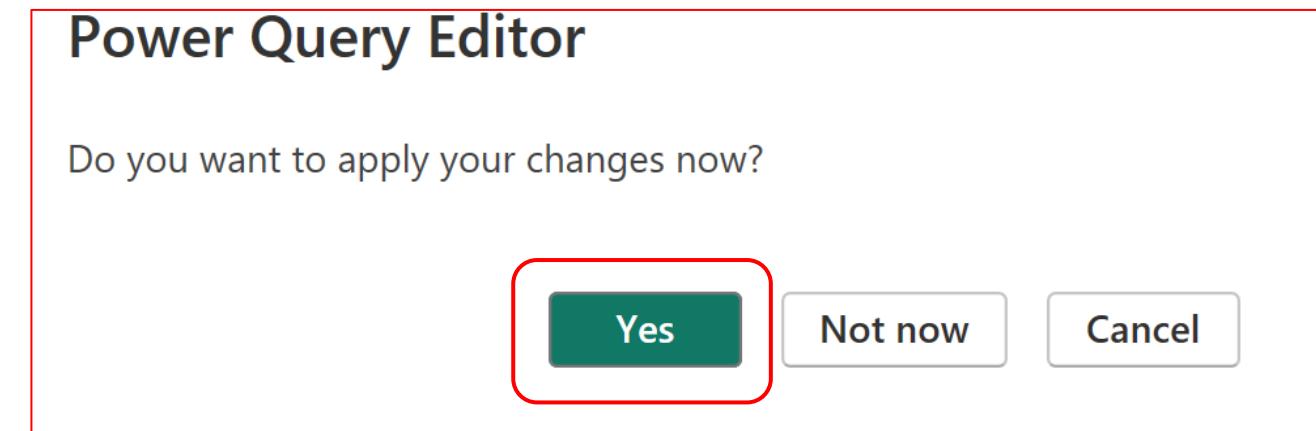
Select 'Discounted Sales Revenue' then Click on Insert, Repeat the process for other columns and form the Formula.

2. Tutorial Week 3: Change Data Type, Save, and Apply Changes

- Change Data Type to Fixed Decimal Number
- Finally, save the work as **Tutor Week 3.pbix** and Click on Apply all Changes if asked!



The screenshot shows the Power Query Editor interface. On the left, the 'Queries [5]' pane shows 'Transactions' as the current query. The main area displays a table with columns 'Revenue' and 'Profit'. The 'Cost of Goods' column has a context menu open, with the 'Fixed decimal number' option highlighted by a red box. To the right, the 'Query Settings' pane shows the 'Name' is set to 'Transactions'. The 'PROPERTIES' section lists the renamed column. The 'APPLIED STEPS' pane lists several steps: 'Changed Type2', 'Renamed Columns1', 'Changed Type3', 'Added Custom', 'Changed Type4', 'Added Custom1', 'Removed Columns1', and 'Renamed Columns2'.



2. Tutorial Week 3: Summary

We have now completed this tutorial on Power BI. In this tutorial we had:

- Load BI
- Acquired Data
- Familiarised ourselves with Query Editor
- Transformed the data
- Changed data Types
- Added custom columns
- Saved our work