



Activity 2: From web data to insights

Learner Guide





Contents

How to use this workbook.....	2
Introduction	3
KSBs	3
Scenario	3
Activity.....	4

How to use this workbook



Activity

Alongside this icon you'll find details of the group/individual activity or a point for everyone to discuss.



Useful tool

This icon indicates a technique that will help you put what you learn into practice.



Important idea or concept

Generally, this icon is used to draw your attention to ideas that you need to understand by this point in the course. Let your trainer know if you do not understand or see the relevance of this idea or concept.



Helpful hint

This icon guides you to tips or hints that will help you avoid the common pitfalls or to show you how to increase your effectiveness or efficiency in practising what you have learnt.



Key point

This icon is used to indicate something that practitioners in this field should know. It's likely to be one of the major things to remember from the course, so check you do understand these key points.



Reference material

When we have only touched briefly on a topic, this icon highlights where to look for additional information on the subject. It may also be used to draw your attention to International or National Standards or Web addresses that have interesting collections of information.



Definition

Where a word with a very specific definition (or one that could be described as jargon) is introduced, this will highlight that a definition is provided.



Warning

This icon is used to point out important information that may affect you and your use of the product or service in question.



Introduction

In this activity, you'll be introduced to Power BI to facilitate you in extracting unstructured data from the web. The objectives are to gather the web data, manipulate it, identify, and explain trends and patterns.

Here, we are going to start looking at Microsoft's PowerBI, a popular Business Intelligence product. As we start this example and open PowerBI, you should recognise the Microsoft Office style layout, which is very similar to Excel. Then, as we work through, you should recognise some of the processes and techniques we have discussed in the discover (online) learning pathway.

KSBs

This activity will cover the following apprenticeship skills elements:

- **S3:** Summarise and explain gathered data
- **S6:** Use tools and techniques to identify trends and patterns in data.

Scenario

In a raffle at work, a friend has won a two night's stay in a London hotel of their choice. They would like to go to the theatre both nights that they are there and has sent you a link to a list of shows they would like to see.

However, they are on a budget, so would like for you to advise them whereabouts in London they should stay in order to get the most out of their trip and to minimise travel costs while there. They would like to keep the cost down as much as possible but have set a fixed limit of £70.

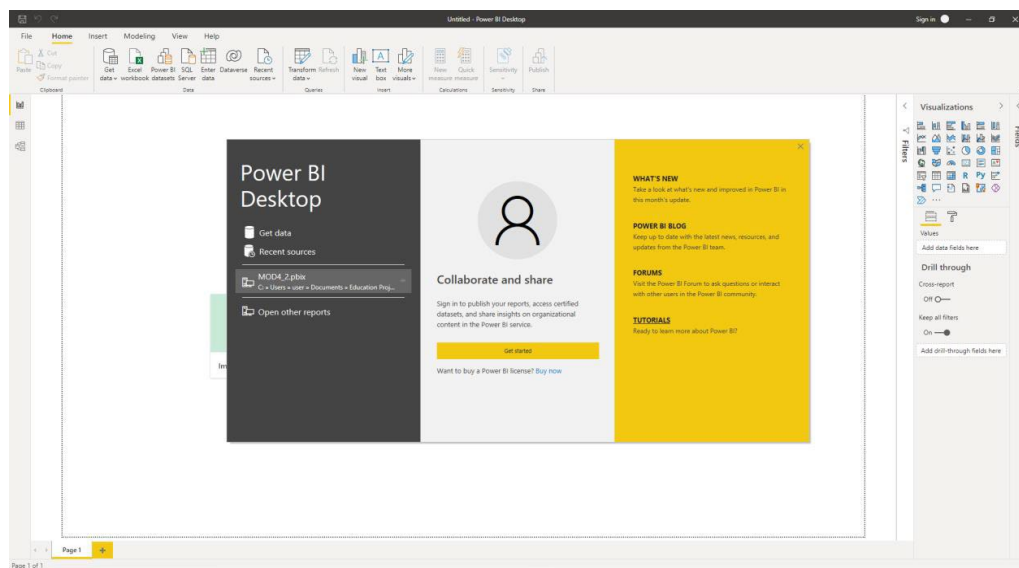
Activity



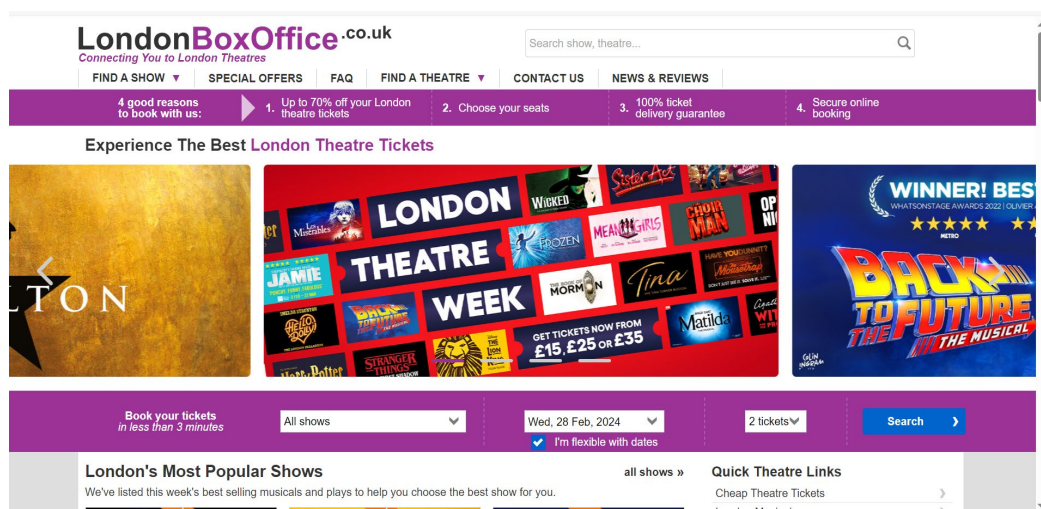
Independent activity:

Extract web data

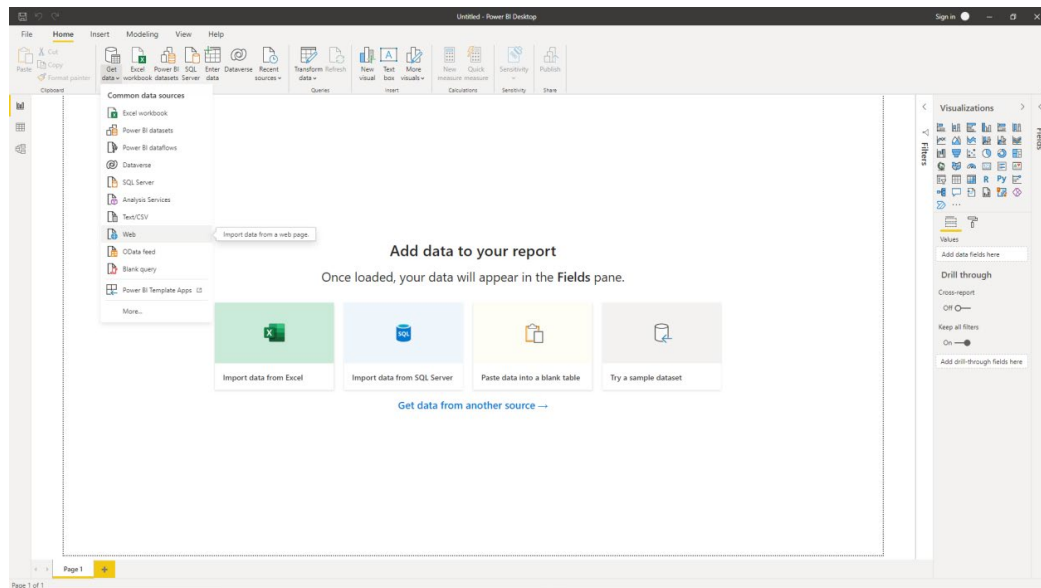
1. Open Microsoft PowerBI. We are going to close the dialog box that appears, but if you were to click Tutorials, you will find a series of courses giving you an in-depth exploration of PowerBI's functionality.



2. First of all, we are going to extract the unstructured data from the link that your friend has sent: <https://www.londonboxoffice.co.uk/>

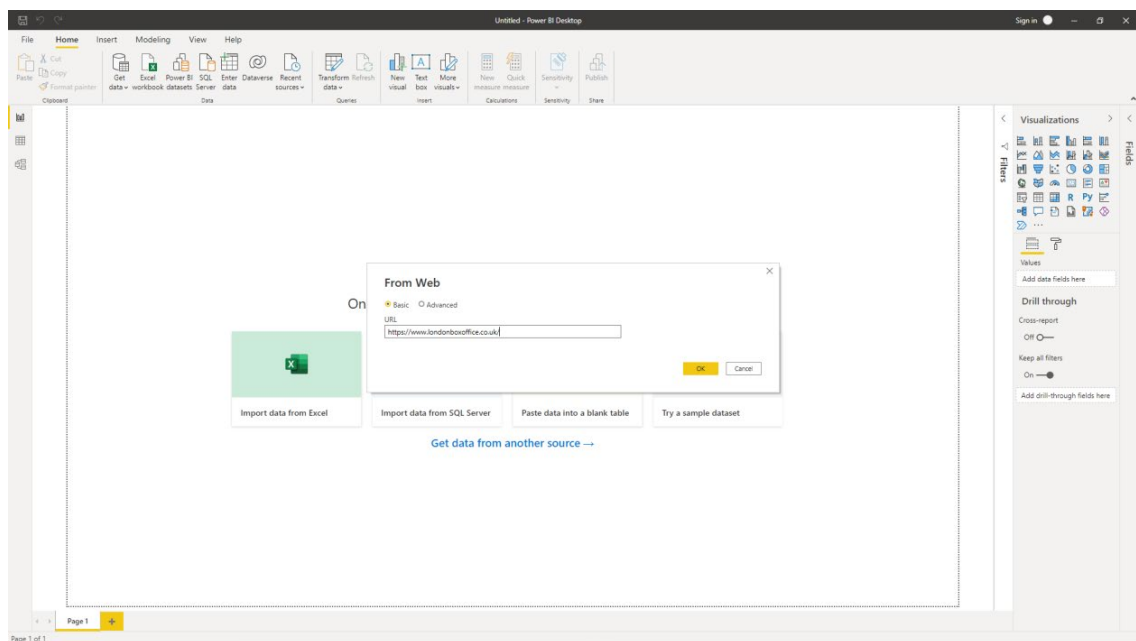


3. Click the drop-down arrow below Home > Get Data. Select Web.

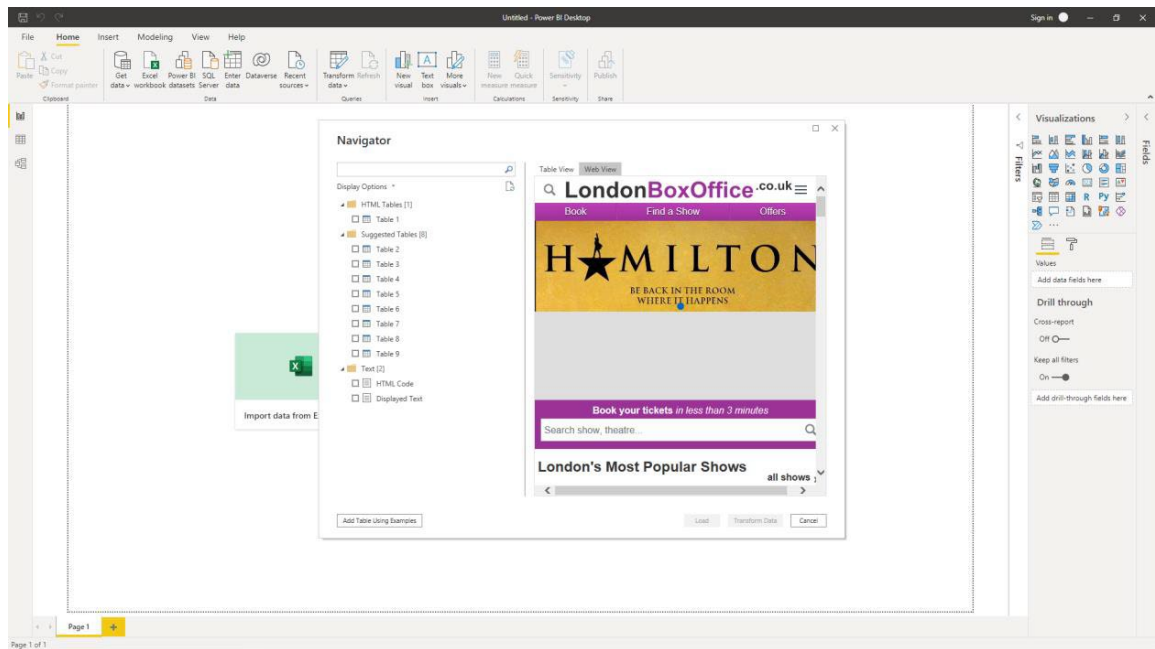


4. Copy and paste the following address into the pop-up window and click OK.

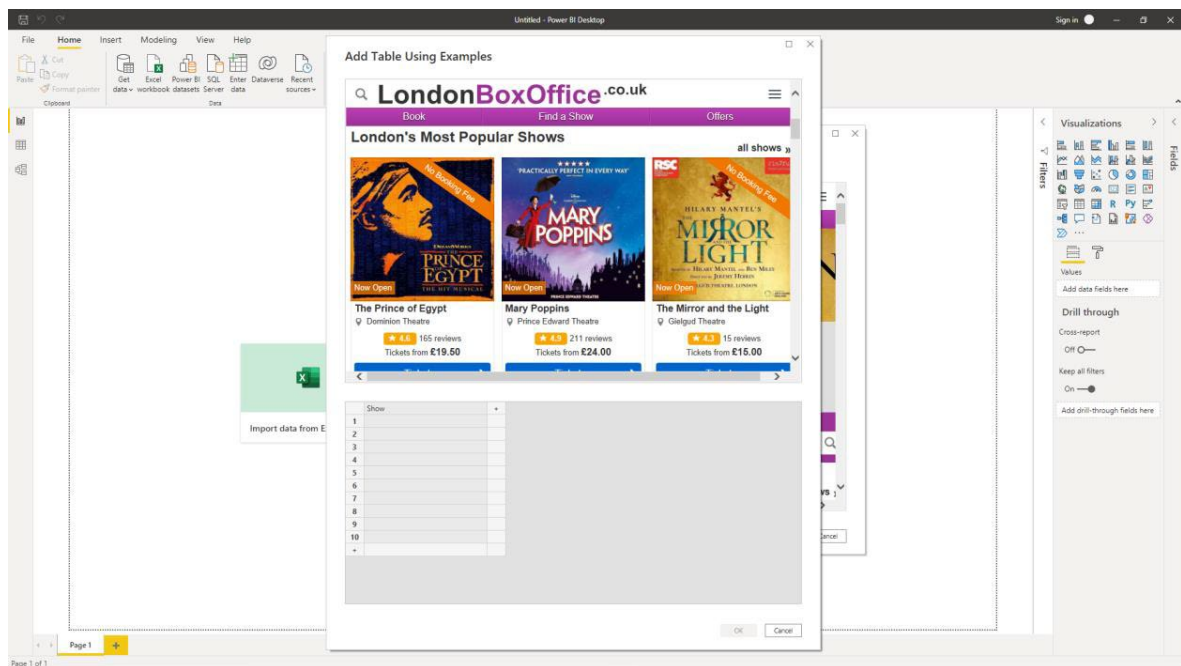
<https://www.londonboxoffice.co.uk/>



5. You can examine the webpage in the Web View tab of the Navigator. Then click **Add Table using Examples**.

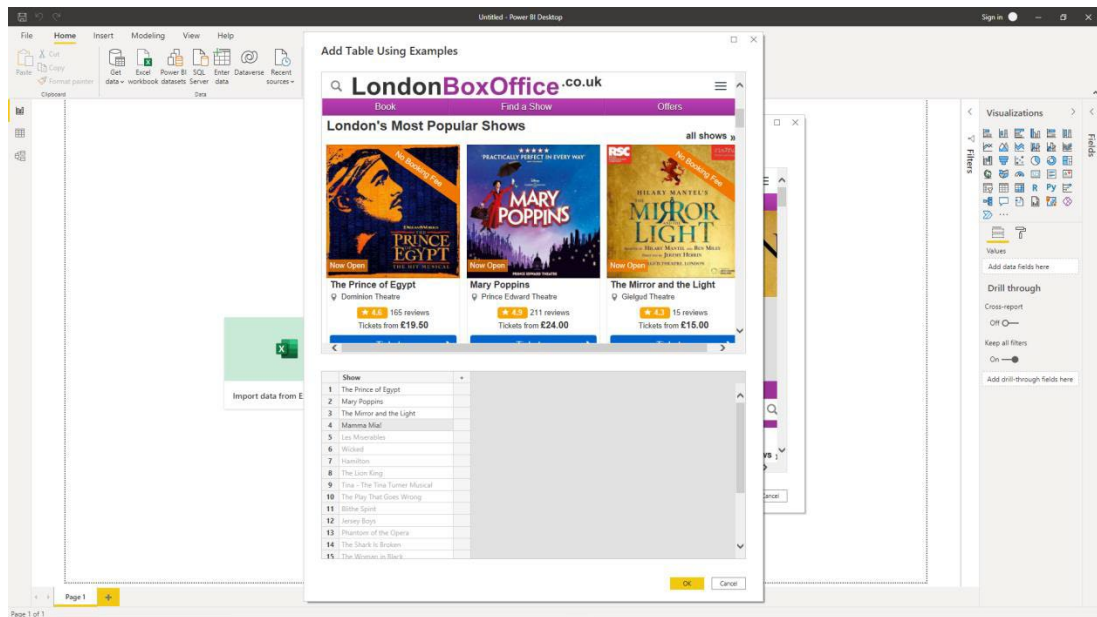


6. You can also see the Web View on the next screen, so can scroll to the data that we are interested in. We can also rename Column1 'Show' by double-clicking in the header.

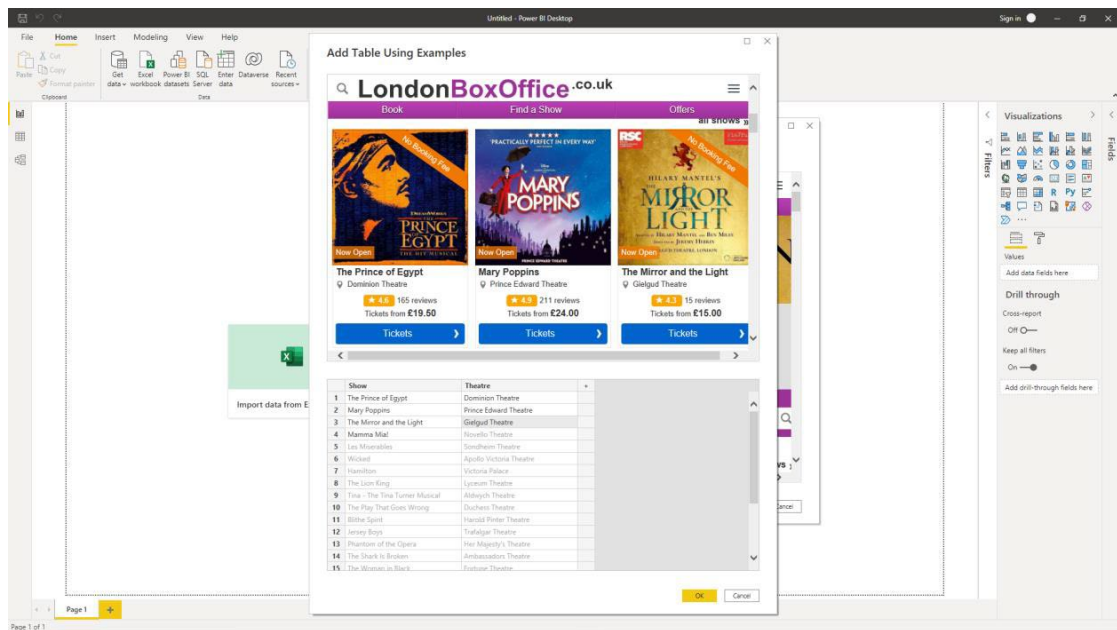


7. We can now give PowerBI examples of the data that we want to populate this column, in this case the production title. As you type, various autofill options will appear. Choose the title, then do the same for row 2. Tab away and the click a blank area in the form.

You can see that the column should be automatically filled with the production titles. However, good practice dictates at the very least a cursory glance to check this is performing as expected.



8. We can click '+' to insert a new column. Rename it 'Theatre', then similarly insert the first 2 rows of data for this column, double checking that the performances are tied to the appropriate theatre.



9. Repeat this process for Price. You can deal with any missing values by clicking in the cell and entering the correct value as you did to populate the first 2 rows. Once you are happy with the data, click OK.

Power BI Desktop - Add Table Using Examples

LondonBoxOffice.co.uk

Book Find a Show Offers

London's Most Popular Shows

all shows

The Prince of Egypt Mary Poppins The Mirror and the Light

Dominion Theatre Prince Edward Theatre Gielgud Theatre

4.6 165 reviews 4.9 211 reviews 4.3 15 reviews

Show	Theatre	Price
1 The Prince of Egypt	Dominion Theatre	£18.50
2 Mary Poppins	Prince Edward Theatre	£24.00
3 The Mirror and the Light	Gielgud Theatre	£15.00
4 Mamma Mia!	Noël Coward Theatre	£18.00
5 Les Misérables	Sondheim Theatre	£24.00
6 Wicked	Apollo Victoria Theatre	£25.50
7 Hamilton	Victoria Palace	£45.00
8 The Lion King	Lyceum Theatre	£25.00
9 Tina - The Tina Turner Musical	Adelphi Theatre	£12.00
10 The Play That Goes Wrong	Duchess Theatre	£24.00
11 Bitchie Spirit	Harold Pinter Theatre	£18.50
12 Jersey Boys	Trafalgar Theatre	£30.00
13 Phantom of the Opera	New Majesty's Theatre	£27.00
14 The Shark is Broken	Ambassadors Theatre	£24.00
15 The Women on Black	Fortune Theatre	£76.00

OK Cancel

10. You should now be able to see a new table under Custom Tables, with a check box ticked. Now click Transform Data.

Power BI Desktop - Navigator

Display Options

- HTML Tables [1]
- Suggested Tables [8]
 - Table 1
 - Table 2
 - Table 3
 - Table 4
 - Table 5
 - Table 6
 - Table 7
 - Table 8
 - Table 9
- Text [2]
 - HTML Code
 - Displayed Text
- Custom Tables [1]
 - ☒ Table 11

Add Table Using Examples

Table View Web View

LondonBoxOffice.co.uk

Book Find a Show Offers

HAMILTON

BE BACK IN THE ROOM WHERE IT HAPPENS

Book your tickets in less than 3 minutes

Search show, theatre

London's Most Popular Shows all shows

Load Transform Data Cancel



Independent activity:

Data transformation

11. This will open Power Query that we have seen briefly before through Excel. Notice that it has recognised our Price column as a currency data type.

Table 11

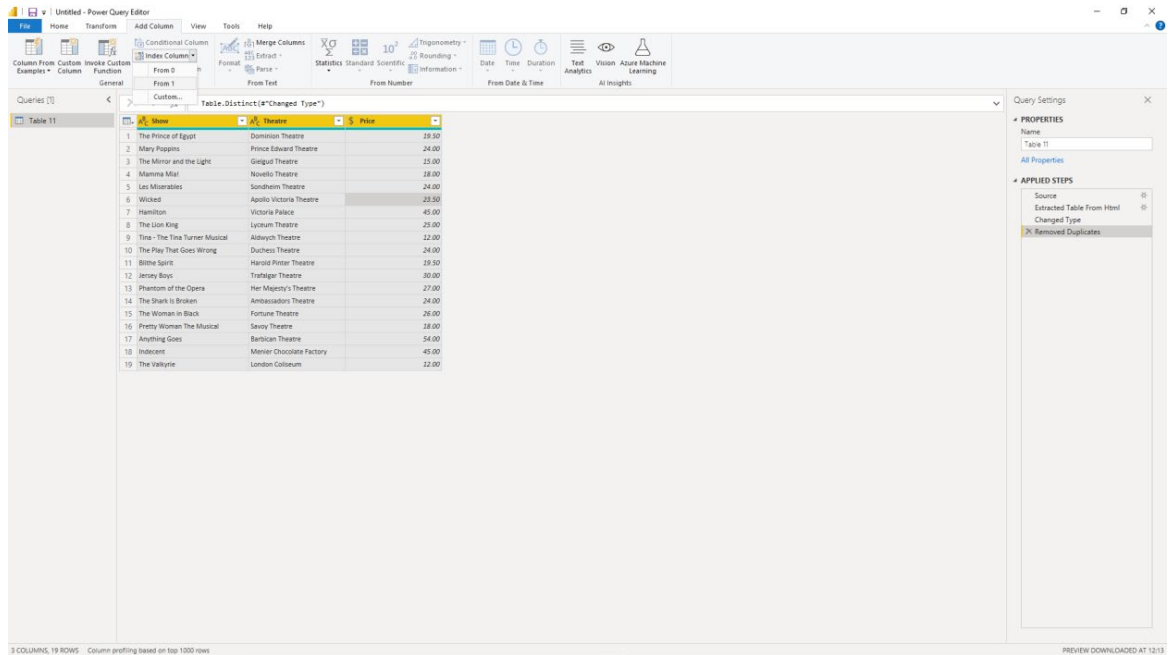
	Show	Theatre	Price
1	The Prince of Egypt	Domino Theatre	29.50
2	Mary Poppins	Prince Edward Theatre	24.00
3	The Mirror and the Light	Gielgud Theatre	25.00
4	Mamma Mia!	Novello Theatre	28.00
5	Les Misérables	Sondheim Theatre	24.00
6	Wicked	Apollo Victoria Theatre	23.50
7	Hamilton	Victoria Palace	45.00
8	The Lion King	Lyceum Theatre	25.00
9	Tina - The Tina Turner Musical	Aldwych Theatre	22.00
10	The Play That Goes Wrong	Duchess Theatre	24.00
11	Blithe Spirit	Harold Pinter Theatre	29.50
12	Jersey Boys	Trafalgar Theatre	30.00
13	Phantom of the Opera	Her Majesty's Theatre	27.00
14	The Shark is Broken	Ambassadors Theatre	24.00
15	The Woman in Black	Fortune Theatre	26.00
16	Pretty Woman The Musical	Savoy Theatre	28.00
17	Blithe Spirit	Harold Pinter Theatre	29.50
18	Anything Goes	Barbican Theatre	34.00
19	Indecent	Menier Chocolate Factory	40.00
20	The Mirror and the Light	Gielgud Theatre	25.00
21	The Valkyrie	London Coliseum	22.00

12. The data we have seems reasonably clean. However, there are a few duplicated records in the list. Press Ctrl-A to select all the data, then in a column header, right-click and select remove duplicates.

Table 11

	Show	Theatre	Price
1	The Prince of Egypt	Domino Theatre	29.50
2	Mary Poppins	Prince Edward Theatre	24.00
3	The Mirror and the Light	Gielgud Theatre	25.00
4	Mamma Mia!	Novello Theatre	28.00
5	Les Misérables	Sondheim Theatre	24.00
6	Wicked	Apollo Victoria Theatre	23.50
7	Hamilton	Victoria Palace	45.00
8	The Lion King	Lyceum Theatre	25.00
9	Tina - The Tina Turner Musical	Aldwych Theatre	22.00
10	The Play That Goes Wrong	Duchess Theatre	24.00
11	Blithe Spirit	Harold Pinter Theatre	29.50
12	Jersey Boys	Trafalgar Theatre	30.00
13	Phantom of the Opera	Her Majesty's Theatre	27.00
14	The Shark is Broken	Ambassadors Theatre	24.00
15	The Woman in Black	Fortune Theatre	26.00
16	Pretty Woman The Musical	Savoy Theatre	28.00
17	Blithe Spirit	Harold Pinter Theatre	29.50
18	Anything Goes	Barbican Theatre	34.00
19	Indecent	Menier Chocolate Factory	40.00
20	The Mirror and the Light	Gielgud Theatre	25.00
21	The Valkyrie	London Coliseum	22.00

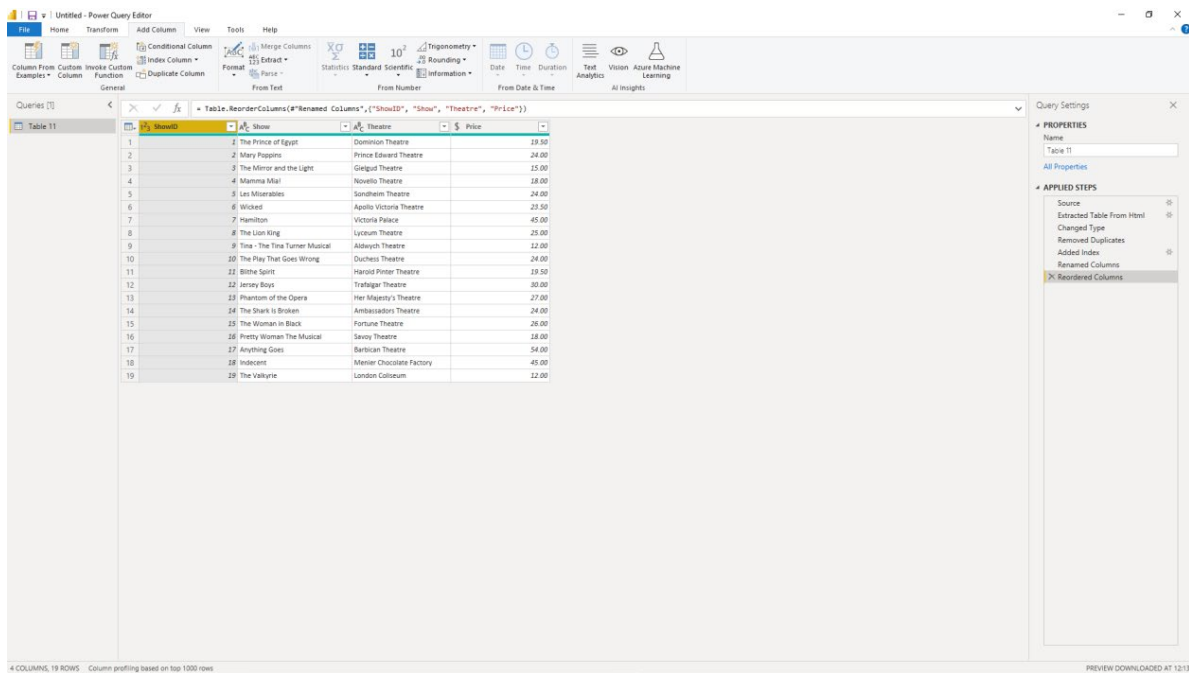
13. Finally, for this table, we want to add a Primary Key by navigating to Add Column, clicking the drop-down arrow next to Index Column, and selecting 'from 1'.



The screenshot shows the Power Query Editor interface. The 'Add Column' tab is selected, and the 'Index Column' dropdown is set to 'From 1'. The table has 3 columns: Show, Theatre, and Price. The data is as follows:

1	2	3
1	The Prince of Egypt	Dominion Theatre
2	Mary Poppins	Prince Edward Theatre
3	The Mirror and the Light	Gielgud Theatre
4	Mamma Mia!	Noëlville Theatre
5	Les Misérables	Sondheim Theatre
6	Wicked	Apollo Victoria Theatre
7	Hamilton	Victoria Palace
8	The Lion King	Licium Theatre
9	Tina - The Tina Turner Musical	Aldwych Theatre
10	The Play That Goes Wrong	Duchess Theatre
11	Blithe Spirit	Harold Pinter Theatre
12	Jersey Boys	Trafalgar Theatre
13	Phantom of the Opera	Her Majesty's Theatre
14	The Shark Is Broken	Ambassadors Theatre
15	The Woman in Black	Fortune Theatre
16	Pretty Woman The Musical	Savoy Theatre
17	Anything Goes	Barbican Theatre
18	Indecent	Menier Chocolate Factory
19	The Vallyrie	London Coliseum

14. You can then Double-click the header and rename the column ShowID. Then click and drag the header across to the left of the table to move the column.



The screenshot shows the Power Query Editor interface. The 'Table.ReorderColumns' function has been applied to the table. The columns are now: ShowID, Show, Theatre, and Price. The data is as follows:

1	2	3	4
1	1	The Prince of Egypt	Dominion Theatre
2	2	Mary Poppins	Prince Edward Theatre
3	3	The Mirror and the Light	Gielgud Theatre
4	4	Mamma Mia!	Noëlville Theatre
5	5	Les Misérables	Sondheim Theatre
6	6	Wicked	Apollo Victoria Theatre
7	7	Hamilton	Victoria Palace
8	8	The Lion King	Licium Theatre
9	9	Tina - The Tina Turner Musical	Aldwych Theatre
10	10	The Play That Goes Wrong	Duchess Theatre
11	11	Blithe Spirit	Harold Pinter Theatre
12	12	Jersey Boys	Trafalgar Theatre
13	13	Phantom of the Opera	Her Majesty's Theatre
14	14	The Shark Is Broken	Ambassadors Theatre
15	15	The Woman in Black	Fortune Theatre
16	16	Pretty Woman The Musical	Savoy Theatre
17	17	Anything Goes	Barbican Theatre
18	18	Indecent	Menier Chocolate Factory
19	19	The Vallyrie	London Coliseum

15. Double-click the table name in the queries panel at the far left of the screen and rename it 'Shows'.

Table.ReorderColumns(*Renamed Columns*,{"ShowID", "Show", "Theatre", "Price"})

ShowID	Show	Theatre	Price
1	The Prince of Egypt	Dominion Theatre	19.50
2	Mary Poppins	Prince Edward Theatre	24.00
3	The Mirror and the Light	Gielgud Theatre	15.00
4	Matilda	Novello Theatre	18.00
5	Les Misérables	Sondheim Theatre	24.00
6	Wicked	Apollo Victoria Theatre	23.50
7	Hamilton	Victoria Palace	45.00
8	The Lion King	Lichfield Theatre	25.00
9	Toy - The First Musical	Albany Theatre	12.00
10	The Play That Goes Wrong	Duchess Theatre	24.00
11	Brother Spirit	Harold Prince Theatre	19.50
12	Jersey Boys	Trafalgar Theatre	30.00
13	Phantom of the Opera	Her Majesty's Theatre	27.00
14	The Shark is Broken	Ambassadors Theatre	24.00
15	The Woman in Black	Fortune Theatre	26.00
16	Pretty Woman The Musical	Savoy Theatre	18.00
17	Anything Goes	Barbican Theatre	54.00
18	Indecent	Menier Chocolate Factory	45.00
19	The Valkyrie	London Coliseum	12.00

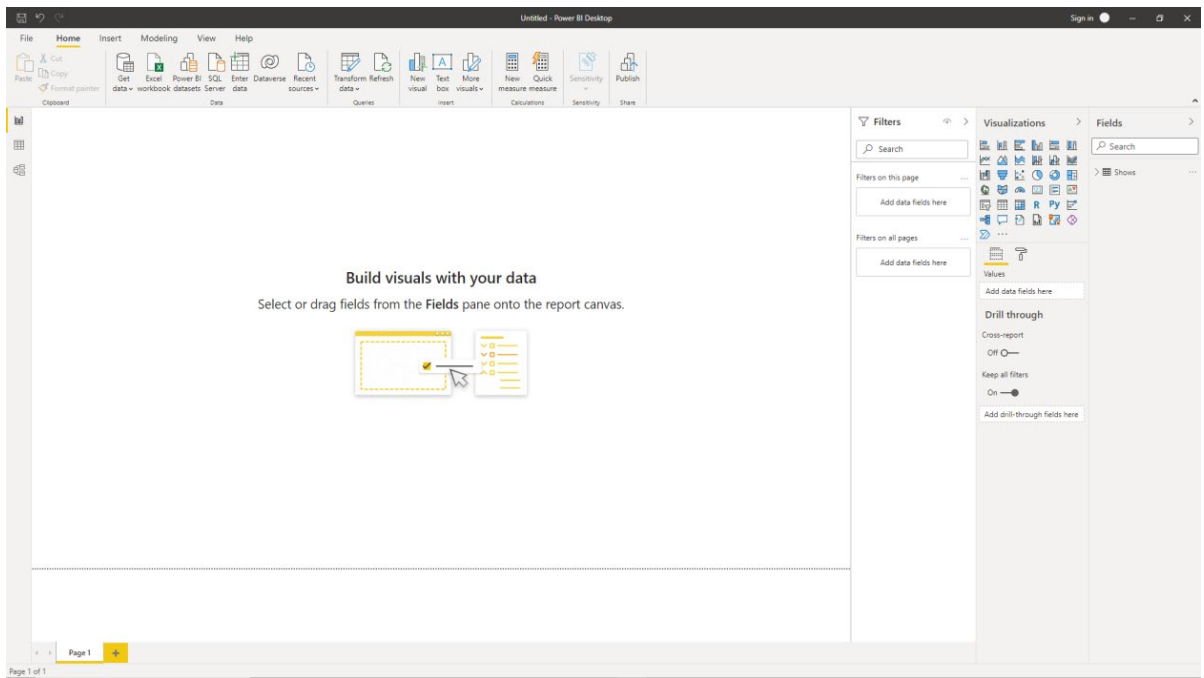
16. Navigate to Home and click Close and Apply.

Close & Apply

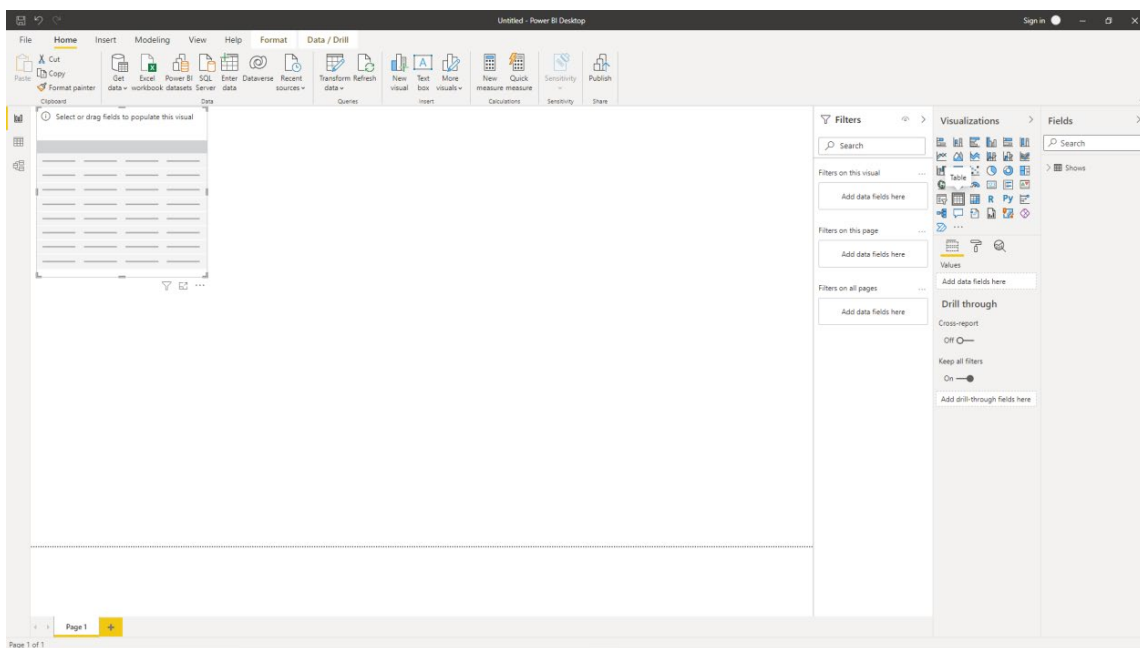
Table.ReorderColumns(*Renamed Columns*,{"ShowID", "Show", "Theatre", "Price"})

ShowID	Show	Theatre	Price
1	The Prince of Egypt	Dominion Theatre	19.50
2	Mary Poppins	Prince Edward Theatre	24.00
3	The Mirror and the Light	Gielgud Theatre	15.00
4	Matilda	Novello Theatre	18.00
5	Les Misérables	Sondheim Theatre	24.00
6	Wicked	Apollo Victoria Theatre	23.50
7	Hamilton	Victoria Palace	45.00
8	The Lion King	Lichfield Theatre	25.00
9	Toy - The First Musical	Albany Theatre	12.00
10	The Play That Goes Wrong	Duchess Theatre	24.00
11	Brother Spirit	Harold Prince Theatre	19.50
12	Jersey Boys	Trafalgar Theatre	30.00
13	Phantom of the Opera	Her Majesty's Theatre	27.00
14	The Shark is Broken	Ambassadors Theatre	24.00
15	The Woman in Black	Fortune Theatre	26.00
16	Pretty Woman The Musical	Savoy Theatre	18.00
17	Anything Goes	Barbican Theatre	54.00
18	Indecent	Menier Chocolate Factory	45.00
19	The Valkyrie	London Coliseum	12.00

17. Now we can start to build a simple dashboard to display all the data we need for decision-making.



18. Let's start by applying some statistical techniques as we did previously in module 4. Click the Table icon in the Visualisations Pane to Insert one into our canvas.



19. Expand Shows in the Fields Pane (on the far right) to display our column headings. Then click the select boxes for Price, Show, and Theatre, or drag them into the visual.

The screenshot shows the Power BI Desktop interface with a table visualization. The table lists various theatre shows and their prices. The 'Price' column is currently set to 'Sum' in the Visualisations pane.

Show	Price	Theatre
Anything Goes	£54	Barbican Theatre
Blithe Spirit	£19.5	Harold Pinter Theatre
Hamilton	£45	Victoria Palace
Indecent	£45	Menier Chocolate Factory
Jersey Boys	£30	Trafalgar Theatre
Les Miserables	£24	Sondheim Theatre
Mamma Mia!	£18	Novello Theatre
Mary Poppins	£24	Prince Edward Theatre
Phantom of the Opera	£27	Her Majesty's Theatre
Pretty Woman The Musical	£18	Savoy Theatre
The Lion King	£25	Lycum Theatre
The Mirror and the Light	£15	Gielgud Theatre
The Play That Goes Wrong	£24	Duchess Theatre
The Prince of Egypt	£19.5	Dominion Theatre
The Shark is Broken	£24	Ambassadors Theatre
The Valkyrie	£12	London Coliseum
The Woman in Black	£26	Fortune Theatre
Tina - The Tina Turner Musical	£12	Aldwych Theatre
Wicked	£23.5	Apollo Victoria Theatre
Total	£485.5	

20. You can resize the table box by dragging the edges, and re-order the columns by dragging the values in the Visualisations Pane. We can see that PowerBI has automatically summed our price column, however, that isn't very useful for our needs. What may be more useful is to find the mean of the prices.

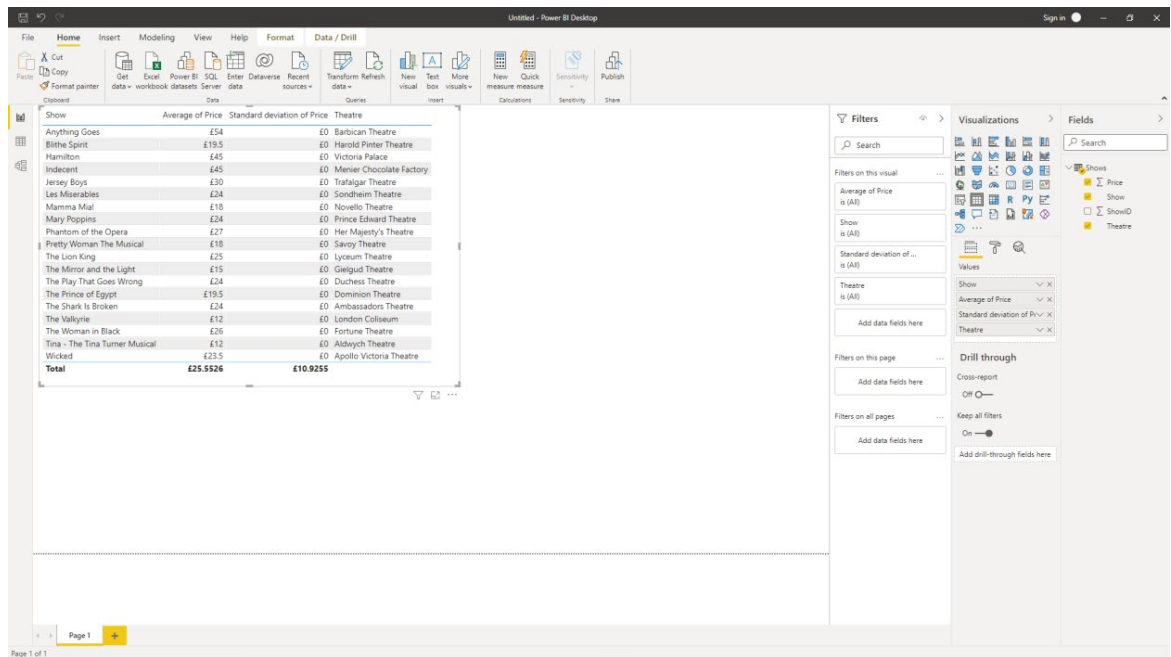
Click the drop-down arrow next to Price in Values section of the Visualisation Pane and select Average.

The screenshot shows the Power BI Desktop interface with the same table visualization. The 'Price' column is now set to 'Average' in the Visualisations pane. A context menu is open over the 'Price' field, showing the 'Average' option selected.

Show	Price	Theatre
Anything Goes	£54	Barbican Theatre
Blithe Spirit	£19.5	Harold Pinter Theatre
Hamilton	£45	Victoria Palace
Indecent	£45	Menier Chocolate Factory
Jersey Boys	£30	Trafalgar Theatre
Les Miserables	£24	Sondheim Theatre
Mamma Mia!	£18	Novello Theatre
Mary Poppins	£24	Prince Edward Theatre
Phantom of the Opera	£27	Her Majesty's Theatre
Pretty Woman The Musical	£18	Savoy Theatre
The Lion King	£25	Lycum Theatre
The Mirror and the Light	£15	Gielgud Theatre
The Play That Goes Wrong	£24	Duchess Theatre
The Prince of Egypt	£19.5	Dominion Theatre
The Shark is Broken	£24	Ambassadors Theatre
The Valkyrie	£12	London Coliseum
The Woman in Black	£26	Fortune Theatre
Tina - The Tina Turner Musical	£12	Aldwych Theatre
Wicked	£23.5	Apollo Victoria Theatre
Total	£485.5	

21. Notice that while that row is still entitled Total, it now displays the Mean. Another important statistical technique we have used before is Standard Deviation.

Drag another example of Price from the Fields Pane to underneath Average of Price in the Values section of the Visualisations Pane, and again click the drop-down arrow, this time selecting Standard Deviation.



22. Your friend wants to know where these shows will be in order to book the most convenient hotel. You search around on the website your friend sent and find the following page which you should paste into the Home > Get Data > From web dialog box.

<https://www.londonboxoffice.co.uk/london-theatres>

Select suggested table3 as below to transform in Power Query.

The screenshot shows the Power BI Desktop interface. The main view displays a table with the following data:

Theatre	Average of Price	Standard deviation of Price
Anything Goes	£54	£
Hamilton	£45	£
Indecent	£45	£
Jersey Boys	£30	£
Phantom of the Opera	£27	£
The Woman in Black	£26	£
The Lion King	£25	£
Les Miserables	£24	£
Mary Poppins	£24	£
The Play That Goes Wrong	£24	£
The Shark is Broken	£24	£
Wicked	£23.5	£
Blithe Spirit	£19.5	£
The Prince of Egypt	£19.5	£
Mamma Mia!	£18	£
Pretty Woman The Musical	£18	£
The Mirror and the Light	£15	£
The Vikings	£12	£
Tina – The Tina Turner Musical	£12	£
Total	£25,5526	£10,925

The Navigator pane on the right shows a list of tables, including 'Table 3' which is selected. The Visualizations pane on the far right shows a bar chart visualization of the data.

23. In Power Query, rename the table Theatres, remove columns 2, 3, 5, and 7 by holding down Ctrl on your keyboard to select all four columns, and right click a header and select Remove columns. Add an Index column as before and drag this column to be the first column. Rename the remaining columns TheatreID, Theatre, Address, and PostCode.

24. Right-click the column heading for PostCode and duplicate the column.

The screenshot shows the Power Query Editor interface. The main view displays a table with the following data:

TheatreID	Theatre	Address	PostCode	PostCode - Copy
1	Adelphi Theatre	409-412 Strand, London, WC2R 0NS GB	WC2R 0NS	WC2R 0NS
2	Adelphi Theatre	49 Adelphi, London, WC2R 0NF GB	WC2R 0NF	WC2R 0NF
3	Ambassadors Theatre	West Street, London, WC2H 9ND GB	WC2H 9ND	WC2H 9ND
4	Apollo Victoria Theatre	17 Milton Road, London, SW1V 1LG GB	SW1V 1LG	SW1V 1LG
5	Cambridge Theatre	12-14 Earlham Street, London, WC2H 9RU GB	WC2H 9RU	WC2H 9RU
6	Donmar Warehouse	268-269 Tottenham Court Road, London, W1T 7TA GB	W1T 7TA	W1T 7TA
7	Duchess Theatre	3-5 Catherine Street, London, WC2B 5LA GB	WC2B 5LA	WC2B 5LA
8	Gaiety Theatre	35-37 Shaftesbury Avenue, London, W1D 6AR GB	W1D 6AR	W1D 6AR
9	Harold Prince Theatre	8 Haymarket, London, SW1Y 4HT GB	SW1Y 4HT	SW1Y 4HT
10	Her Majesty's Theatre	57 Haymarket, London, SW1Y 4QL GB	SW1Y 4QL	SW1Y 4QL
11	London Coliseum	St Martin's Lane, London, WC2N 4ES GB	WC2N 4ES	WC2N 4ES
12	Lyncum Theatre	21 Watlington Street, London, WC2E 7RQ GB	WC2E 7RQ	WC2E 7RQ
13	Novello Theatre	5 Adelphi, London, WC2R 0LD GB	WC2R 0LD	WC2R 0LD
14	Phoenix Theatre	Charing Cross Road, London, WC2H 0GP GB	WC2H 0GP	WC2H 0GP
15	Prince Edward Theatre	28 Old Compton Street, London, W1D 4HS GB	W1D 4HS	W1D 4HS
16	Savoy Theatre	Strand, London, WC2R 0ET GB	WC2R 0ET	WC2R 0ET
17	Sondheim Theatre	51 Shaftesbury Avenue, London, W1D 6SA GB	W1D 6SA	W1D 6SA
18	Theatre Royal Haymarket	8 Haymarket, London, SW1Y 4HT GB	SW1Y 4HT	SW1Y 4HT
19	Trafalgar Theatre	14 Whitehall, London, SW1A 2DZ GB	SW1A 2DZ	SW1A 2DZ
20	Victoria Palace	Victoria Street, London, SW1E 5EA GB	SW1E 5EA	SW1E 5EA
21	Wyndham Theatre	31 Shaftesbury Avenue, London, W1D 7ES GB	W1D 7ES	W1D 7ES
22	Arts Theatre	6-7 Great Newport Street, London, WC2H 7JB GB	WC2H 7JB	WC2H 7JB
23	Barbican Theatre	66 Barbican, London, EC2Y 8DS GB	EC2Y 8DS	EC2Y 8DS
24	Charing Cross Theatre	The Arches, Villiers Street, London, WC2H 9PL GB	WC2H 9PL	WC2H 9PL
25	Chichester Theatre	Chichester Square, London, WC2H 9AP GB	WC2H 9AP	WC2H 9AP
26	Criterion Theatre	Piccadilly Circus, London, SW1Y 4XA GB	SW1Y 4XA	SW1Y 4XA
27	Drury Lane Theatre Royal	Catherine Street, London, WC2B 5LP GB	WC2B 5LP	WC2B 5LP
28	State of York Theatre	104 St Martin's Lane, London, WC2H 4BS GB	WC2H 4BS	WC2H 4BS
29	Fortune Theatre	Russell Street, London, WC2H 9JH GB	WC2H 9JH	WC2H 9JH
30	Garrick Theatre	2 Charing Cross Road, London, WC2H 0DH GB	WC2H 0DH	WC2H 0DH
31	Gaiety Theatre	35-37 Shaftesbury Avenue, London, W1D 6AR GB	W1D 6AR	W1D 6AR
32	Old Vic Theatre	103 St Martin's Lane, London, WC2H 9JH GB	WC2H 9JH	WC2H 9JH
33	Hammerheads Apollo (Evening)	1 Queen Caroline Street, London, W6 9QH GB	W6 9QH	W6 9QH
34	Kit Kat Club at the Playhouse	Northumberland Avenue, London, WC2N 5DE GB	WC2N 5DE	WC2N 5DE
35	Lancaster Square Theatre	6 Lancaster Place, London, WC2H 7EX GB	WC2H 7EX	WC2H 7EX
36	Lancaster Square Hall	Belvedere Road, London, SE1 7YR GB	SE1 7YR	SE1 7YR
37	London Hippodrome	Lancaster Square, London, WC2H 7JH GB	WC2H 7JH	WC2H 7JH
38	London Palladium	8 Argyll Street, London, W1F 7TF GB	W1F 7TF	W1F 7TF
39	London Theatre to be announced		null	null
40	Lyric Theatre	39 Shaftesbury Avenue, London, W1D 7ES GB	W1D 7ES	W1D 7ES
41	Lyric Theatre	39 Shaftesbury Avenue, London, W1D 7ES GB	W1D 7ES	W1D 7ES

The 'PostCode - Copy' column is highlighted, indicating it has been duplicated.

25. Split column PostCode – Copy by the right most space delimiter,

then split column PostCode - Copy.1 by digit to non-digit. Then, remove the two right most columns.

The screenshot shows the Power Query Editor with the 'DuplicateColumn' step applied to the 'PostCode - Copy' column. The resulting table has 5 columns: TheatreID, Theatre, PostCode, PostCode - Copy, and PostCode - Copy.1. The data is as follows:

1	2	3	4	5
TheatreID	Theatre	PostCode	PostCode - Copy	PostCode - Copy.1
1	Adelphi Theatre	WC2R 0NS	WC2R 0NS	WC2R 0NS
2	Adelphi Theatre	WC2R 4DF	WC2R 4DF	WC2R 4DF
3	Ambassadors Theatre	WC2N 9ND	WC2N 9ND	WC2N 9ND
4	Apollo Victoria Theatre	SW1V 5LG	SW1V 5LG	SW1V 5LG
5	Cambridge Theatre	WC2H 9HU	WC2H 9HU	WC2H 9HU
6	Domino Theatre	W1T 7AQ	W1T 7AQ	W1T 7AQ
7	Duchess Theatre	WC2B 5LA	WC2B 5LA	WC2B 5LA
8	Gaiety Theatre	W1D 6AR	W1D 6AR	W1D 6AR
9	Harold Pinter Theatre	SW1V 4DN	SW1V 4DN	SW1V 4DN
10	Her Majesty's Theatre	SW1Y 4QL	SW1Y 4QL	SW1Y 4QL
11	London Coliseum	WC2N 4ES	WC2N 4ES	WC2N 4ES
12	Lyceum Theatre	WC2E 7RQ	WC2E 7RQ	WC2E 7RQ
13	Novello Theatre	WC2B 4LD	WC2B 4LD	WC2B 4LD
14	Phoenix Theatre	WC2H 6DP	WC2H 6DP	WC2H 6DP
15	Prince Edward Theatre	W1D 4HS	W1D 4HS	W1D 4HS
16	Savoy Theatre	WC2R 0ET	WC2R 0ET	WC2R 0ET
17	Sondheim Theatre	W1D 6BA	W1D 6BA	W1D 6BA
18	Theatre Royal Haymarket	SW1Y 4HT	SW1Y 4HT	SW1Y 4HT
19	Trafalgar Theatre	SW1A 2DV	SW1A 2DV	SW1A 2DV
20	Victoria Palace	SW1E 5EA	SW1E 5EA	SW1E 5EA
21	Apollo Theatre	W1D 7ES	W1D 7ES	W1D 7ES
22	Arts Theatre	WC2H 7JB	WC2H 7JB	WC2H 7JB
23	Barbican Theatre	EC2Y 8DS	EC2Y 8DS	EC2Y 8DS
24	Charing Cross Theatre	WC2N 6NL	WC2N 6NL	WC2N 6NL
25	Christmas in Leicester Square	WC2H 6AP	WC2H 6AP	WC2H 6AP
26	Criterion Theatre	SW1Y 4XA	SW1Y 4XA	SW1Y 4XA
27	Drury Lane Theatre Royal	WC2B 5JF	WC2B 5JF	WC2B 5JF
28	Duke of York's Theatre	WC2N 4BG	WC2N 4BG	WC2N 4BG
29	Fortune Theatre	WC2B 5HH	WC2B 5HH	WC2B 5HH
30	Garrick Theatre	WC2H 0HH	WC2H 0HH	WC2H 0HH
31	Gaiety's Mansion, Immersive London	W1X 5HB	W1X 5HB	W1X 5HB
32	Gillian Lynne Theatre	WC2B 5PW	WC2B 5PW	WC2B 5PW
33	HammerSmith Apollo (Eventim)	W8 9QH	W8 9QH	W8 9QH
34	Kat Kat Club at the Playhouse	WC2N 5DE	WC2N 5DE	WC2N 5DE
35	Leicester Square Theatre	WC2H 7BK	WC2H 7BK	WC2H 7BK
36	London County Hall	SE1 7PB	SE1 7PB	SE1 7PB
37	London Hippodrome	WC2H 7JH	WC2H 7JH	WC2H 7JH
38	London Palladium	W1F 7TF	W1F 7TF	W1F 7TF
39	London Theatre to be announced	null	null	null
40	Lyric Theatre	W1D 7ES	W1D 7ES	W1D 7ES
41	Majestic Theatre, Leicester Square	EC1 4HL	EC1 4HL	EC1 4HL

26.Finally, rename the newest column 'Area', then Close and Apply.

The screenshot shows the Power Query Editor with the 'RenameColumn' step applied to the 'PostCode - Copy.1' column, renaming it to 'Area'. The resulting table has 5 columns: TheatreID, Theatre, PostCode, PostCode - Copy, and Area. The data is as follows:

1	2	3	4	5
TheatreID	Theatre	PostCode	PostCode - Copy	Area
1	Adelphi Theatre	409-412 Strand	WC2R 0NS	WC2
2	Adelphi Theatre	49 Abchurch	WC2R 4DF	WC2
3	Ambassadors Theatre	West Street	WC2N 9ND	WC2
4	Apollo Victoria Theatre	17 Wilton Road	SW1V 5LG	SW1
5	Cambridge Theatre	32-34 Earham Street	WC2H 9HU	WC2
6	Domino Theatre	268-269 Tottenham Court Road	W1T 7AQ	W1
7	Duchess Theatre	5-5 Catherine Street	WC2B 5LA	WC2
8	Gaiety Theatre	95-97 Shaftesbury Avenue	W1D 6AR	W1
9	Harold Pinter Theatre	6 Fanny Street	SW1V 4DN	SW1
10	Her Majesty's Theatre	57 Haymarket	SW1Y 4QL	SW1
11	London Coliseum	56 Martin's Lane	WC2N 4ES	WC2
12	Lyceum Theatre	21 Wellington Street	WC2E 7RQ	WC2
13	Novello Theatre	5 Aldwych	WC2B 4LD	WC2
14	Phoenix Theatre	Charing Cross Road	WC2H 6DP	WC2
15	Prince Edward Theatre	28 Old Compton Street	W1D 4HS	W1
16	Savoy Theatre	Strand	WC2R 0ET	WC2
17	Sondheim Theatre	51 Shaftesbury Avenue	W1D 6BA	W1
18	Theatre Royal Haymarket	8 Haymarket	SW1Y 4HT	SW1
19	Trafalgar Theatre	14 Whitehall	SW1A 2DV	SW1
20	Victoria Palace	Victoria Street	SW1E 5EA	SW1
21	Apollo Theatre	31 Shaftesbury Avenue	W1D 7ES	W1
22	Arts Theatre	6-7 Great Newport Street	WC2H 7JB	WC2
23	Barbican Theatre	58a Street	EC2Y 8DS	EC2
24	Charing Cross Theatre	The Arches, Villiers Street	WC2N 6NL	WC2
25	Christmas in Leicester Square	Leicester Square	WC2H 6AP	WC2
26	Criterion Theatre	Piccadilly Circus	SW1Y 4XA	SW1
27	Drury Lane Theatre Royal	Catherine Street	WC2B 5JF	WC2
28	Duke of York's Theatre	104 St Martin's Lane	WC2N 4BG	WC2
29	Fortune Theatre	Russell Street	WC2B 5HH	WC2
30	Garrick Theatre	2 Charing Cross Road	WC2H 0HH	WC2
31	Gaiety's Mansion, Immersive London	56 Davies Street	W1X 5HB	W1
32	Gillian Lynne Theatre	166 Drury Lane	WC2B 5PW	WC2
33	HammerSmith Apollo (Eventim)	2 Queen Caroline Street	W8 9QH	W8
34	Kat Kat Club at the Playhouse	Northumberland Avenue	WC2N 5DE	WC2
35	Leicester Square Theatre	6 Leicester Place	WC2H 7BK	WC2
36	London County Hall	Belvedere Road	SE1 7PB	SE1
37	London Hippodrome	Leicester Square	WC2H 7JH	WC2
38	London Palladium	8 Argill Street	W1F 7TF	W1
39	London Theatre to be announced	null	null	null
40	Lyric Theatre	29 Shaftesbury Avenue	W1D 7ES	W1
41	Majestic Theatre, Leicester Square	EC1 4HL	EC1 4HL	EC1



Independent activity:

Data modelling

27. Now we have two tables, we can start creating a data model.
Navigate to the Modelling ribbon > Manage relationships.

Show	Average of Price	Standard deviation of Price	Theatre
Anything Goes	£54	£0	Barbican Theatre
Blithe Spirit	£19.5	£0	Harold Pinter Theatre
Hamilton	£45	£0	Victoria Palace
Indecent	£45	£0	Menier Chocolate Factory
Jersey Boys	£30	£0	Trafalgar Theatre
Les Misérables	£24	£0	Sondheim Theatre
Mamma Mia!	£10	£0	Novello Theatre
Mary Poppins	£24	£0	Prince Edward Theatre
Phantom of the Opera	£27	£0	Her Majesty's Theatre
Pretty Woman The Musical	£18	£0	Savoy Theatre
The Lion King	£25	£0	Lycium Theatre
The Mirror and the Light	£15	£0	Gielgud Theatre
The Play That Goes Wrong	£24	£0	Duchess Theatre
The Prince of Egypt	£19.5	£0	Dominion Theatre
The Shark Is Broken	£24	£0	Ambassadors Theatre
The Valleyrie	£12	£0	London Coliseum
The Woman in Black	£26	£0	Fortune Theatre
Tina - The Tina Turner Musical	£12	£0	Aldwych Theatre
Wicked	£23.5	£0	Apollo Victoria Theatre
Total	£25.5526	£10.9255	

28. Here you can see that it has autodetected the relationship between Theatre in Shows and Theatre in Theatres.

Active	From Table (Columns)	To Table (Columns)
<input checked="" type="checkbox"/>	Shows (Theatre)	Theatres (Theatre)

29. If that relationship hadn't been autodetected, you can add relationships manually by using the new button and specifying relationships. You can then OK and close back to the dashboard.

The screenshot shows the Microsoft Power BI Desktop interface. On the left, a data table is displayed with columns: Show, Average of Price, Standard deviation of Price, and Theatre. The table lists various musicals and their associated theatres and prices. A 'Create relationship' dialog box is open in the center, prompting the user to select tables and columns that are related. The dialog shows two tables: 'Shows' and 'Theatres'. The 'Shows' table has columns: ShowID, Show, Theatre, and Price. The 'Theatres' table has columns: TheatreID, Theatre, Address, PostCode, and Area. The dialog also shows the cardinality of the relationship as 'One to one (1:1)' and the cross filter direction as 'Both'. The 'Make this relationship active' checkbox is checked. The 'OK' button is highlighted in yellow.

30. You can also view and manage your data model by clicking the bottom most icon on the far left of the screen. Navigate back to the dashboard with the topmost icon.

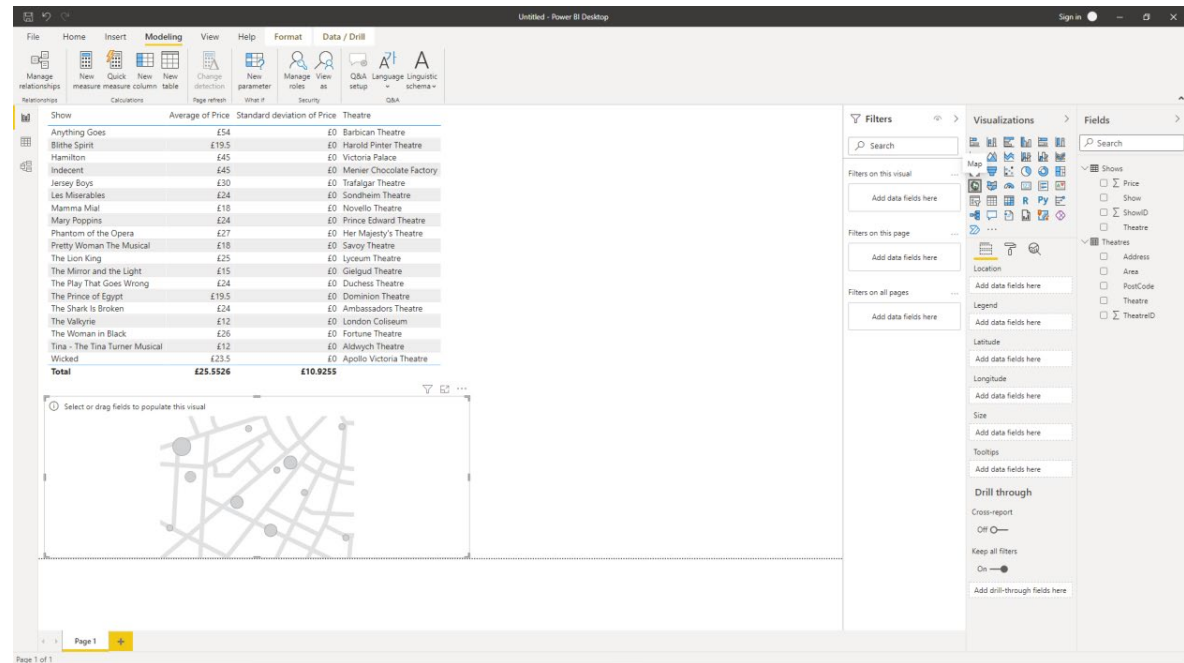
The screenshot shows the Microsoft Power BI Desktop interface in the 'Model' view. The data model is displayed, showing two tables: 'Shows' and 'Theatres'. The 'Shows' table has columns: Price, Show, ShowID, and Theatre. The 'Theatres' table has columns: Address, Area, PostCode, Theatre, and TheatreID. A relationship line connects the 'Theatre' column in the 'Shows' table to the 'TheatreID' column in the 'Theatres' table. The 'Properties' pane on the right shows the details of the selected table, including its name, description, synonyms, row label, key column, and whether it is hidden or featured. The 'Fields' pane on the right shows the available fields for the selected table.



Independent activity:

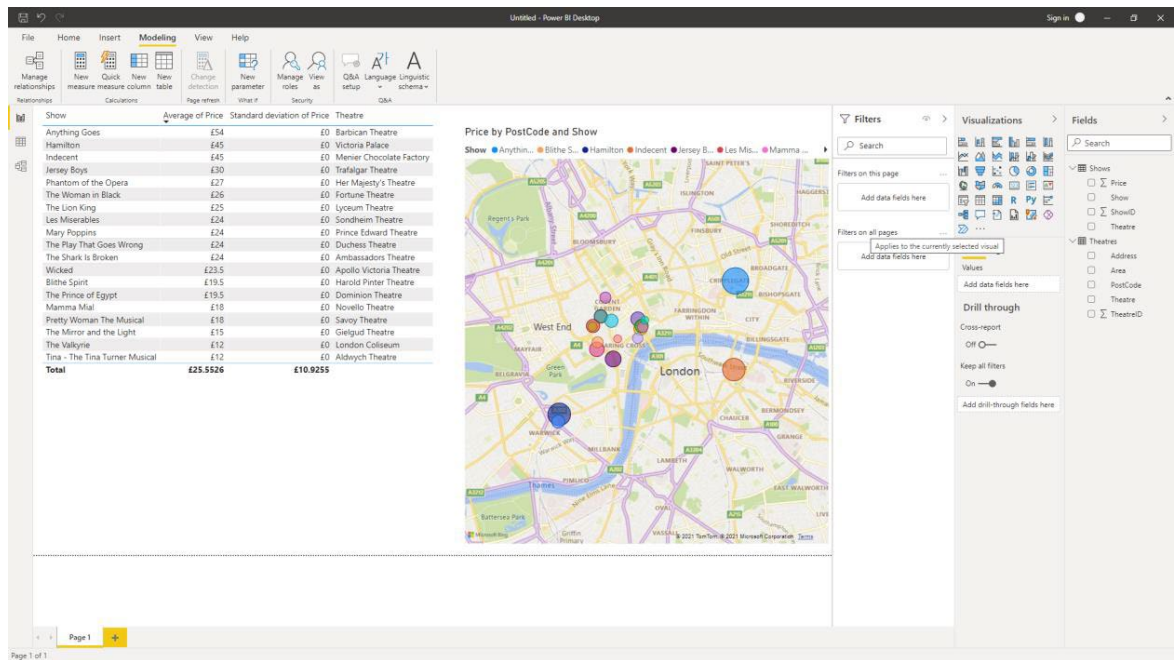
Map visualisation

31. Click away from your Table visualisation and insert a map visualisation.

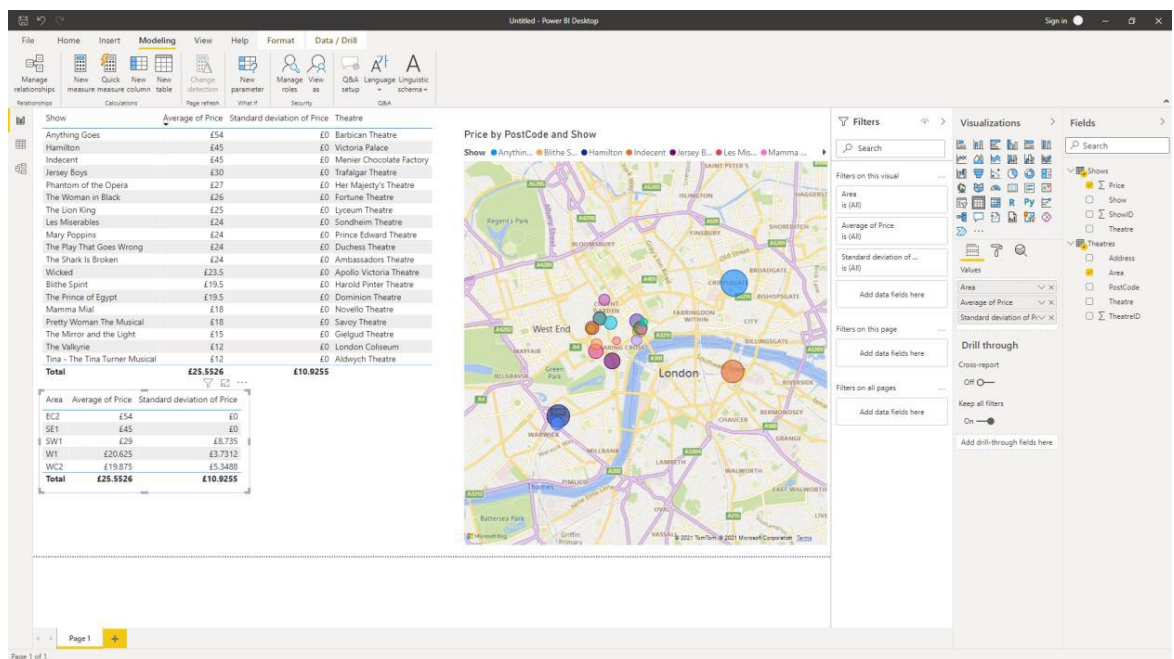


32. Drag into the map Postcode from Theatres and Price from Shows. You will see the map update with the locations of the theatres with PowerBI automatically sizing by Price. Drag the Show field into the Legend section of the Visualisations Pane, to show on the map which performance is where. Resize and reposition the map over to the right of the dashboard.

What trends, patterns, or insights present themselves in your results?

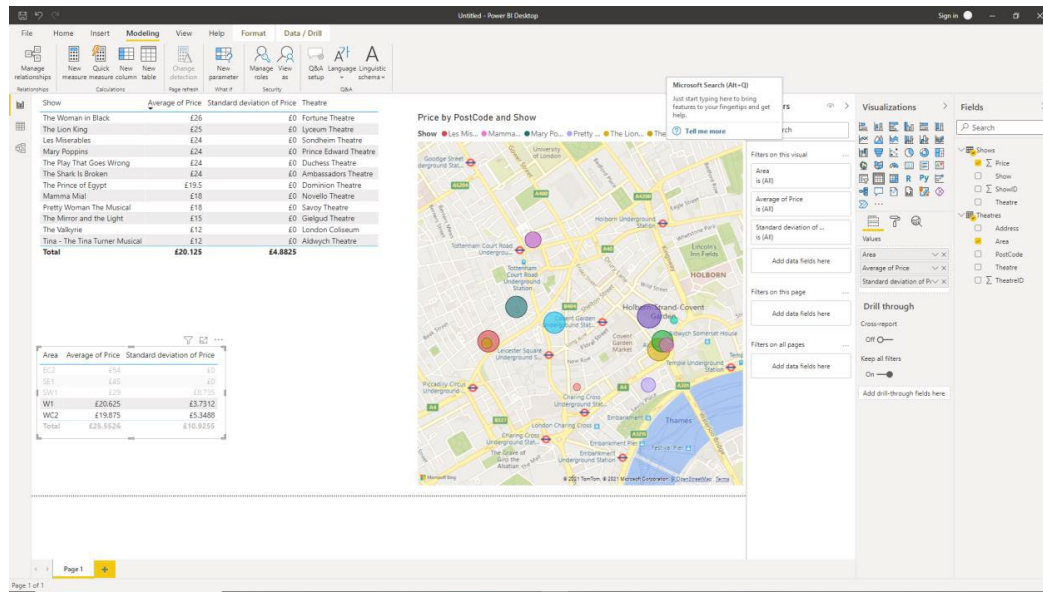


33. In your dashboard, insert a new table visualisation and populate it with fields, Area and two instances of Price. Then in the Values section of the Visualisation Pane set one Price to Average and one to Standard Deviation as before.



34. By selecting the cheapest area by average, or ctrl-selecting multiple, we can quickly focus on just the information useful to us.

Think of the ways in which this could be improved, for instance, showing ratings or accessibility. Can you add hotels to the map to help your friend in their search?



35. Save your work as evidence and submit to your DLC via your Bud account.

