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Loading Data in Power BI

Loading data into Power BI

In this train you will learn how to:

- Load data that consists of different data types into Power BI Desktop;
- Set up an ERD data model;
- Link data in Power BI

Power BI

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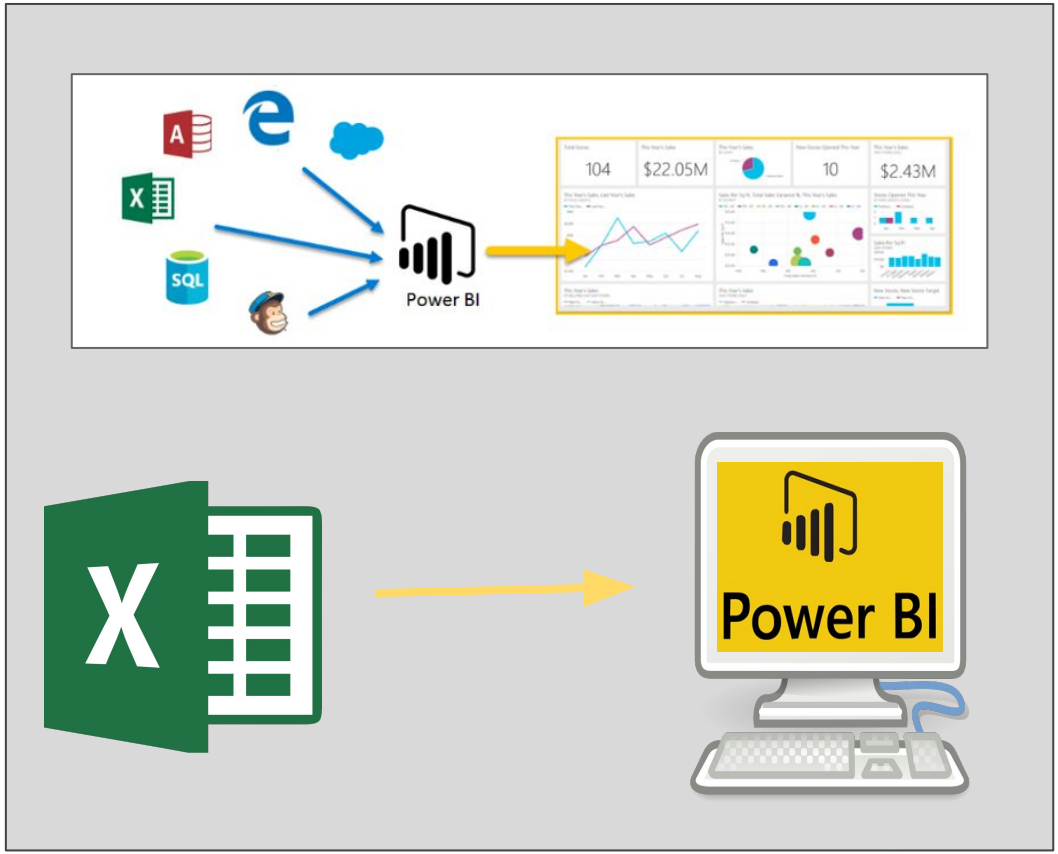
Outline

- The first step to visualising your data is knowing how to load your data into Power BI.
- Power BI is both dynamic and versatile in the number of data source types that it allows connection to.
- In this train, we will focus on loading data into Power BI that consists of different data types.
- We will also gain an understanding of the importance of linking data and how to set up an ERD data model.



Source

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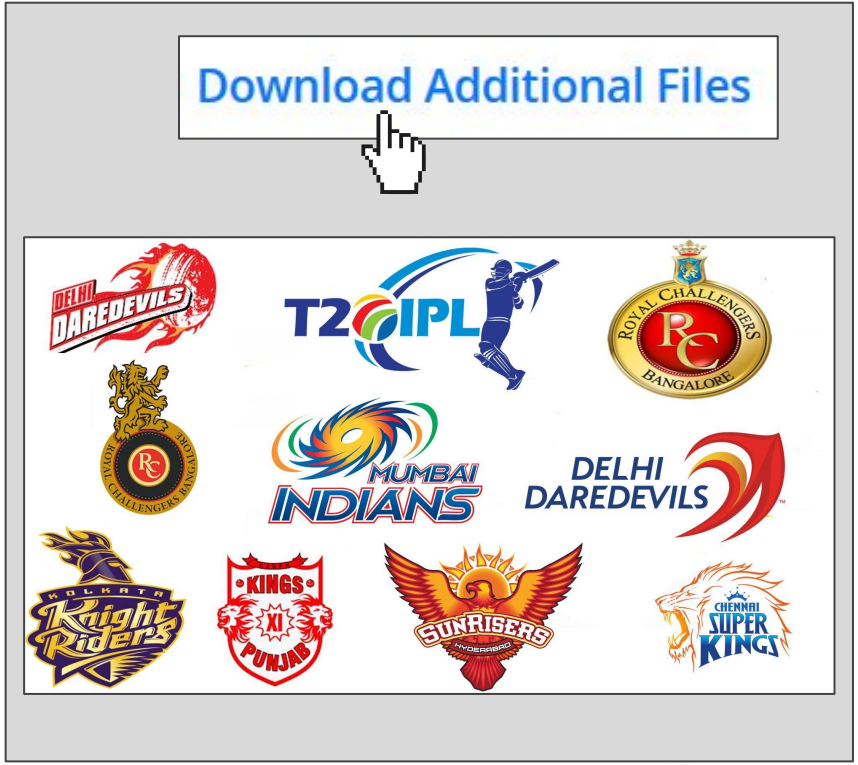
Load IPL Excel datasets into Power BI

Before we get started, let's go ahead and download the files we will be working with.

- For this train we will be working with data extracted from the IPL (Indian Premier League).
- Download the zip file with the datasets by clicking "**DOWNLOAD ADDITIONAL FILES**" on Athena. Extract the files. There should be a file called "**deliveries.xlsx**" and one called "**matches.xlsx**".



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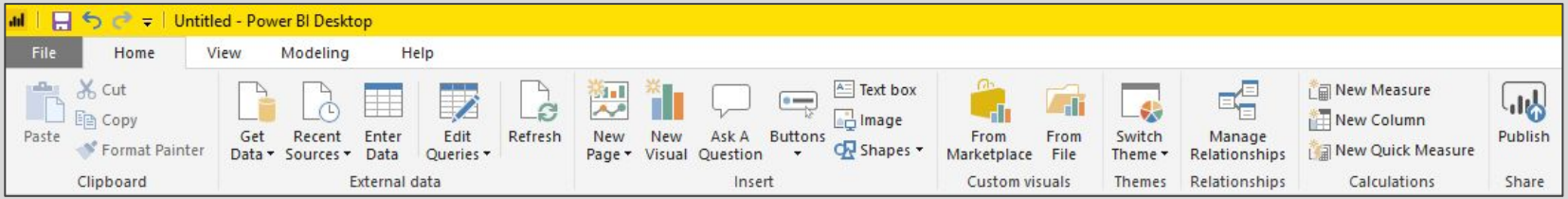
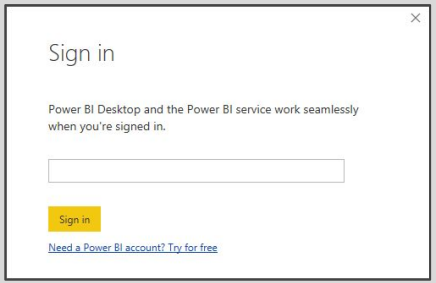
Load IPL EXCEL datasets into Power BI

Step 1:

- Open Power BI desktop. Alternatively, you can download it here.



Page Selector – Navigate between your pages



Sign In – By selecting 'Sign In' from the top right of the window this dialogue box pops up. We will not sign in as of yet instead we will work offline.

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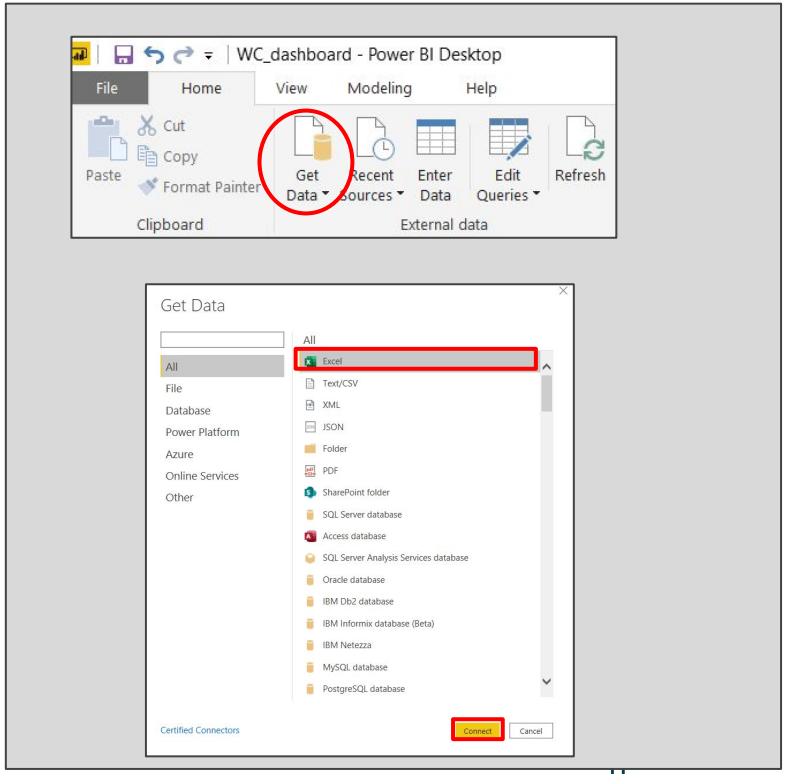
Load IPL EXCEL datasets into Power BI

Step 2:

- Click the “Get Data” button then select “**Excel**”.
- In the file browser, navigate to your “**matches.xlsx**” and hit the “**connect**” button.



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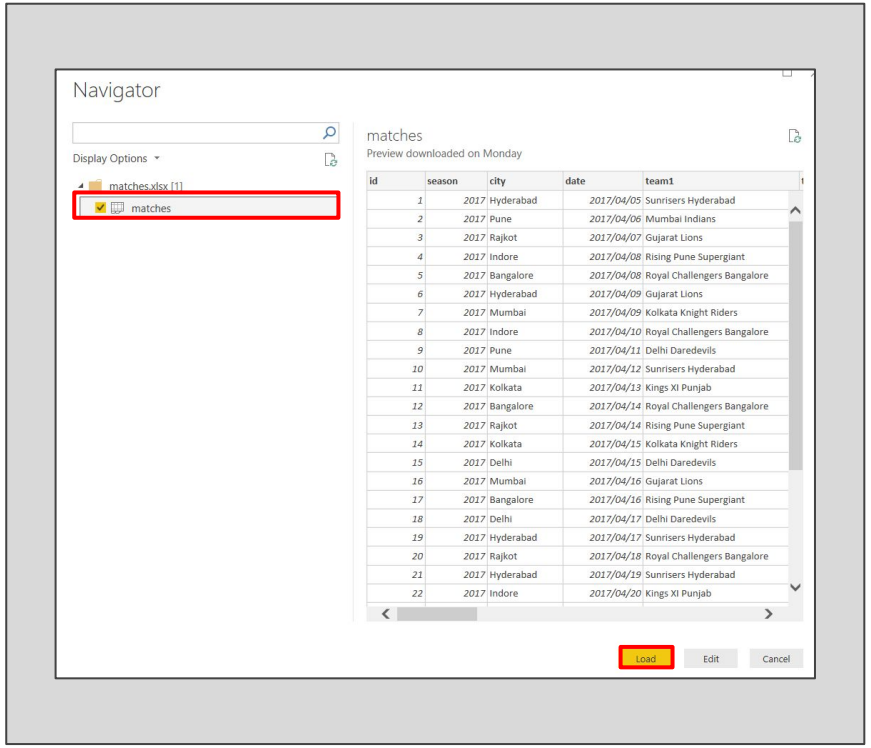
Load IPL EXCEL datasets in Power BI

Step 3:

- Tick the "**matches**" box on the Navigator pop-up and then click "**load**" (picture on the right).
- Repeat the same steps for the **deliveries** table.
- When you are loading your data, Power BI will attempt to convert the data type of the source column into a data type that better supports more efficient storage, calculations, and data visualization.
- Let's go ahead and see how we can determine and specify a column's data type.



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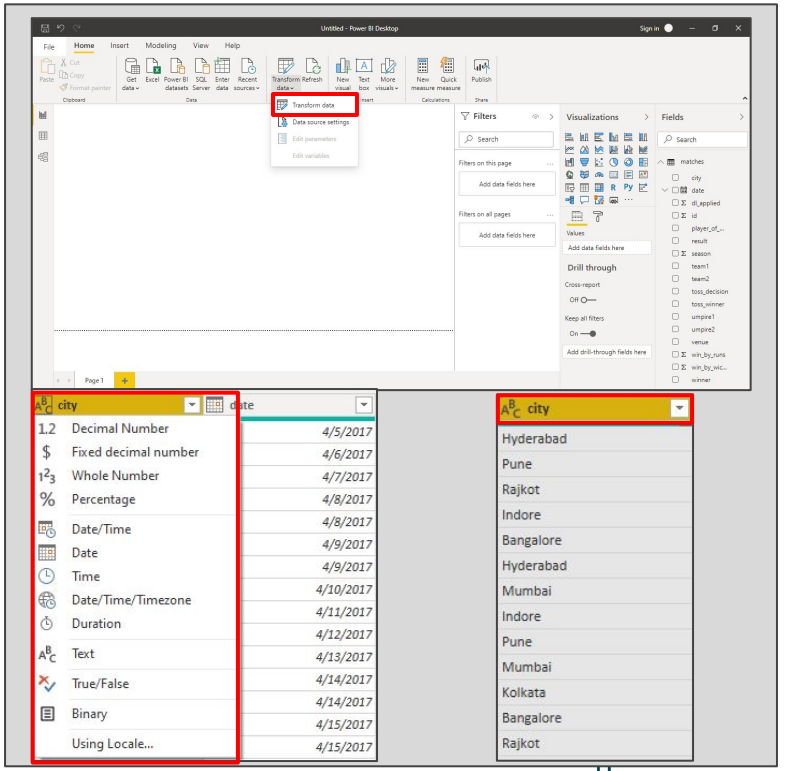
Specifying a data type

In Power BI Desktop, you can determine and specify a columns data type in the Query Editor, Data View or Report View.

Step 4:

- Next we will learn how to specify a column's data type using the Query Editor in Power BI. We can start by selecting **Transform data** on the **Home tab.** This will open **Query Editor** in a new window in Power BI.
- In the Query Editor, we can specify each column's data type by clicking on each column and choosing from the list of data types that are supported in Power BI.
- We can see from the image on the right the data type for **City** is text data, which can also be referred to as "string data" and symbolized by 
- Many data types that are supported by Power BI. We will take a look at each of these data types in the next slide.

Take note: DAX functions require special data types for the function to work correctly.



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Data types in Power BI

Power BI supports the following Data Types:

Text types

A Unicode character data string.
Can be strings, numbers, or dates represented in a text format.

Date/Time types

Date/time - Represents both a date and time value.
Date - Represents just a date.
Time - Represents just time.
Date/Time/Timezone - Represents a UTC date/time with a timezone offset.
Duration - Represents a length of time. It's converted into a decimal number.

True/False type

True/False - A Boolean value of either a True or False.

Number types

Decimal- Represents a 64 bit (eight-byte) floating-point number. i.e how Excel stores its numbers.
Fixed- Has a fixed location for the decimal separator.
Whole- Represents a 64 bit (eight-byte) integer value. Can be useful in cases where you need to control rounding.

Binary type

Used to represent any other data with a binary format.

Blank type

A data type that contains a blank value. This is the value that is assigned to a column when the data contains a NULL value.
Used in DAX to replace SQL null values.

Linking data in Power BI

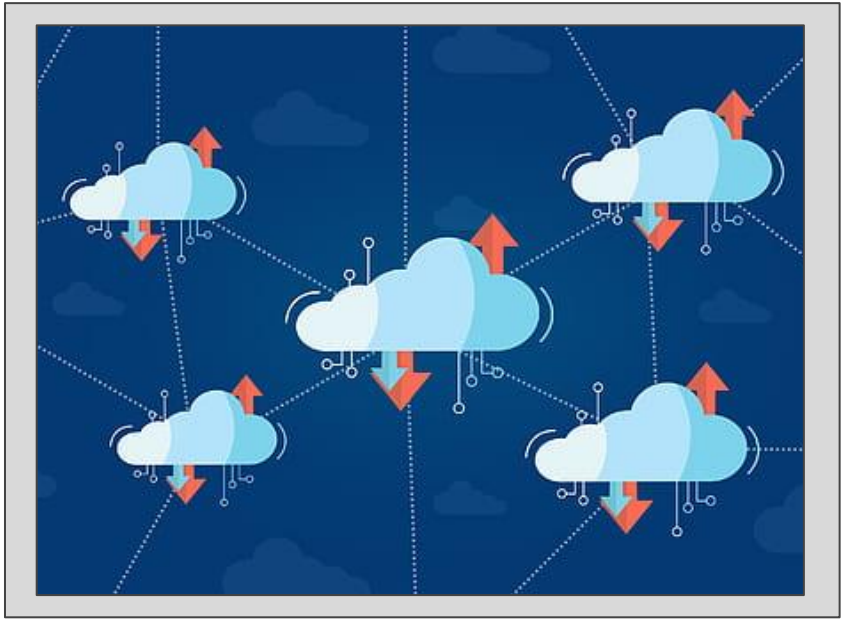
Now that we have loaded our data and specified the data type of each column in our datasets, we can now move on to linking our datasets together.

Power BI Relationships

When we import multiple tables, chances are we will do some analysis using data from these tables. **Relationships between tables** allow the accurate calculation of results and display the correct information in reports. Power BI allows us to define relationships between tables, which enabling us to define visuals which span across multiple tables and create linked visuals. .

The resulting linked tables are referred to as a **data model** in Power BI.

Note: Relationships in Power BI are similar to relationships in SQL.

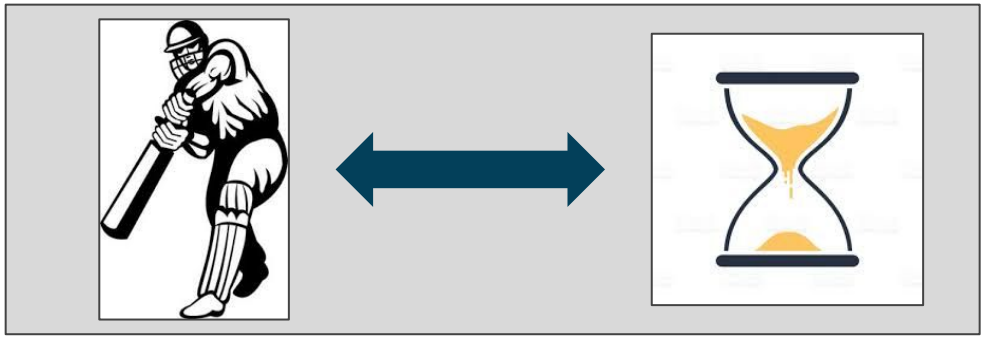


Linking data in Power BI

When we import data into Power BI we obtain tables whose columns can be used to create different types of visuals, measures, and filters. These are useful for extracting insights from data. Power BI Desktop contains an auto detect feature which “automatically” creating relationships between tables for you. However, sometimes you might have to create relationships yourself, or make changes to a relationship. Let’s see how we can do this in Power BI.

Example:
The **deliveries** table has player stats and no date column, while the **matches** table has dates, but no player stats.

Therefore, if we want to analyse player stats over time, these tables need to be joined.



Linking data in Power BI

As in the relationships between SQL tables, Power BI relationships also have **cardinality**. Each model relationship must be defined with a cardinality type, the possible relationship cardinality options are:

Cardinality	Notation	Description
one-to-one	1-1	One row in table A relates to one row in table B.
one-to-many	1-*	One row in table A relates to multiple rows in table B.
many-to-one	*-1	Multiple rows in table A relate to one row in table B.
many-to-many	*-*	Multiple rows in table A relate to multiple rows in table B.

Note: the “1” implies unique entries for a given column and the “*” implies multiple values in the same column.

Setting up a data model

Now we can move onto linking the **deliveries** and **matches** tables.

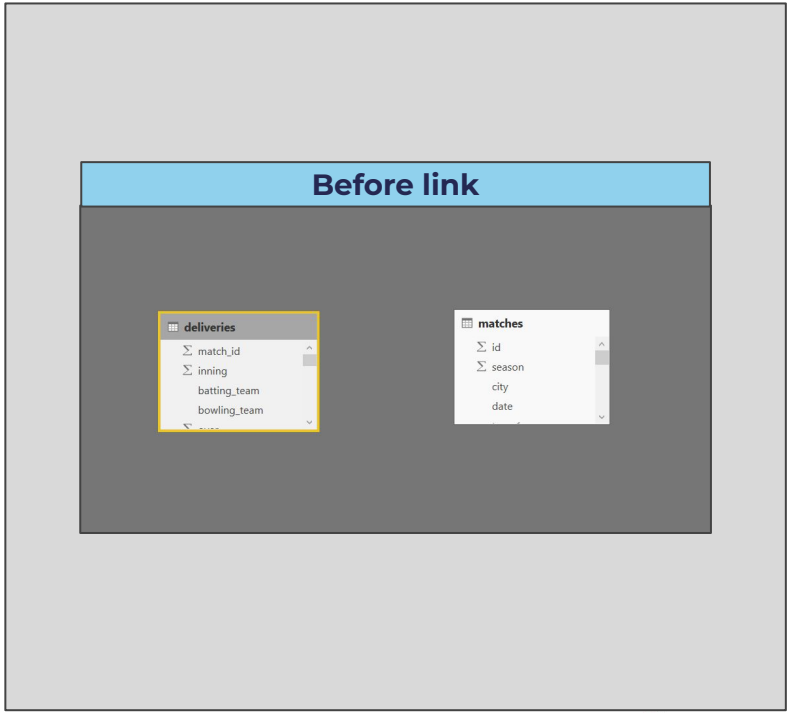
Entity Relationship Diagrams (ERD) are used to visualise the relationship of shared data between multiple tables. Next we look at how we can create an ERD in Power BI.

Currently, your ERD should look like the "**Before link**" picture on the right. As you can see there is no link between the two tables.

We need to link the tables **using a unique key from one table**. We can see that both tables have a column related to the match:

- deliveries: *match_id*
- matches: *id*

The id's in **matches** are unique. We can create a relationship between the deliveries: match_id and matches: id.



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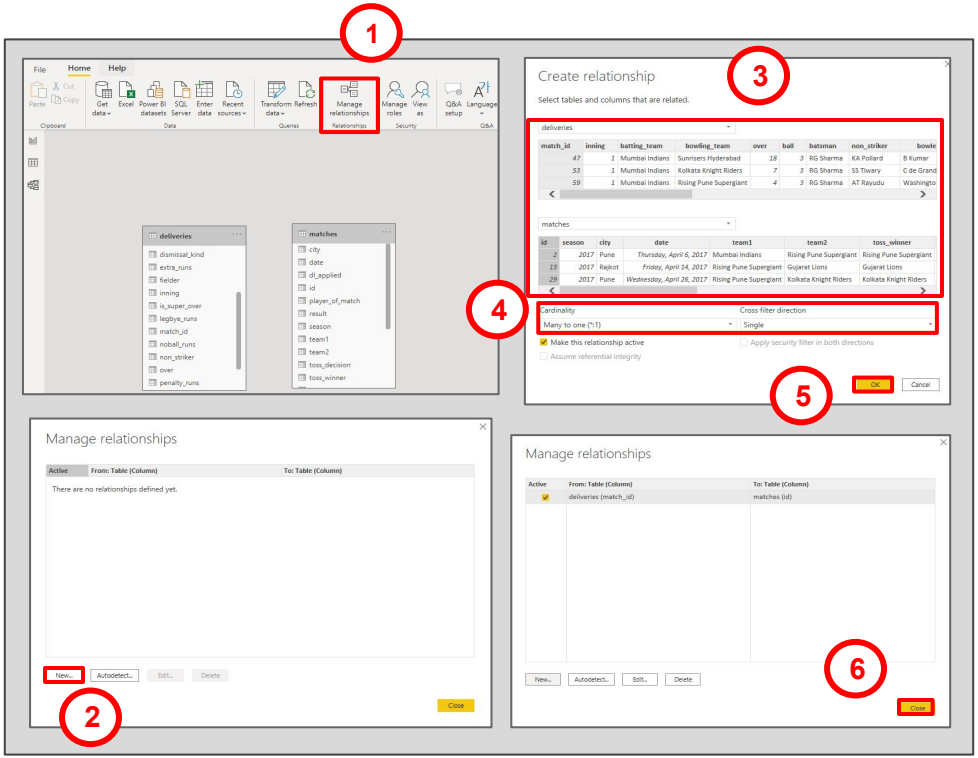
Setting up a data model

Now we can move onto linking the **deliveries** and **matches** tables.

Creating a relationship in Power BI

1. Navigate and select “Manage Relationships” on the Home tab.
2. Select “New”.
3. In the “create relationship” dialog box, in the first table drop-down list, select the column you want to use in the relationship and do the same for the second table.
4. By default Power BI desktop configures the options: **Cardinality** (direction), **Cross filter** direction. You can change these settings if necessary.
5. Select “OK”.
6. Your relationship is now active. Complete the process by selecting “Close.”



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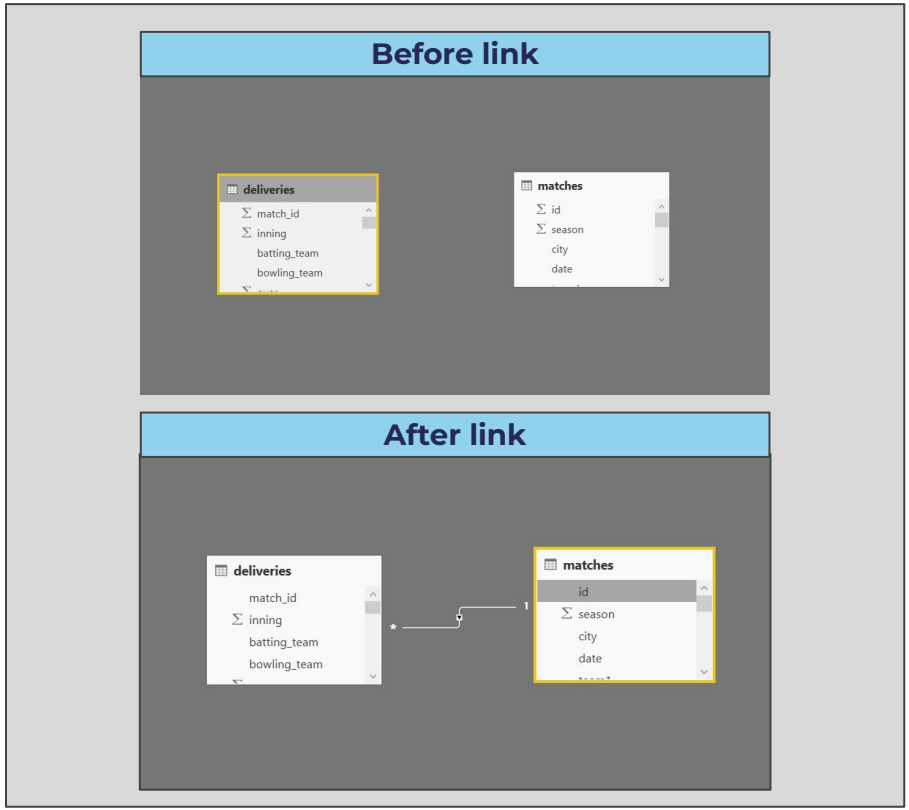
Setting up a data model

Now we can move onto linking the **deliveries** and **matches** tables.

After linking the tables your ERD should look like the "**After link**" picture on the right.

To **edit a relationship** you can do the following:

1. Select Manage Relationship on the Home tab.
2. In the Manage relationships dialog box, select the relationship, then select "Edit."



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Conclusion

In this train we learnt how to load data into a Power BI project in preparation for downstream tasks such as dynamic visual creation. An important component of such loading surrounds the linking of multiple tables to form an ERD, allowing analysis to be performed across multiple tables. Lastly, we observed the various data types supported in PBI, and how these types can be configured when loading data.

We encourage you to import data with disparate data types in Power BI and create your very own ERD.

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Appendix

Links to additional resources to help with the understanding of concepts presented in the train

- Data types in Power BI
- Query overview in Power BI
- Import Excel workbooks in Power BI

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