

Power BI Desktop

Sample manual - first two chapters



Wise Owl
Training

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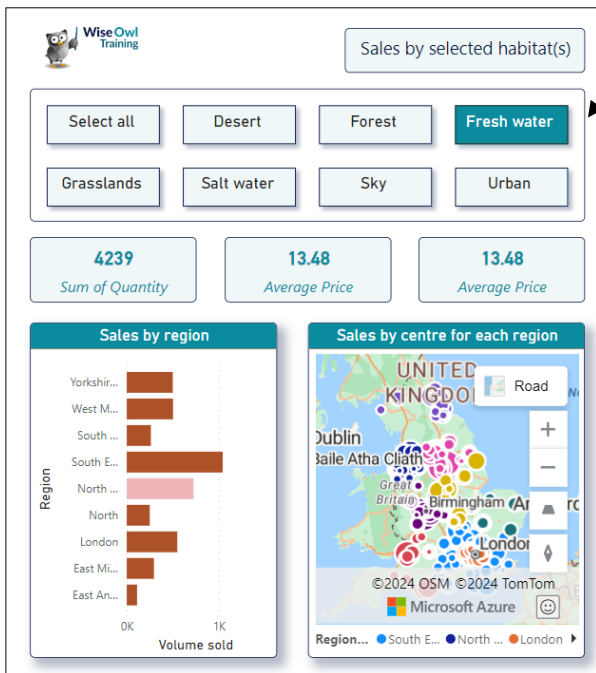
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CHAPTER 1 - POWER BI BASICS

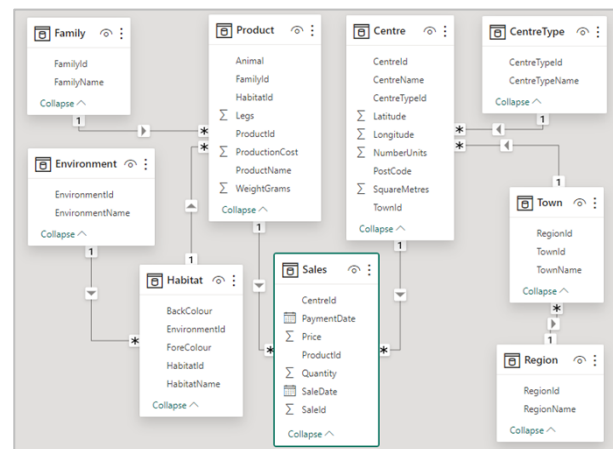
1.1 What is Power BI Desktop?

Power BI Desktop is a standalone software application from Microsoft which allows you to load data into a model, and then create pretty reports like this:



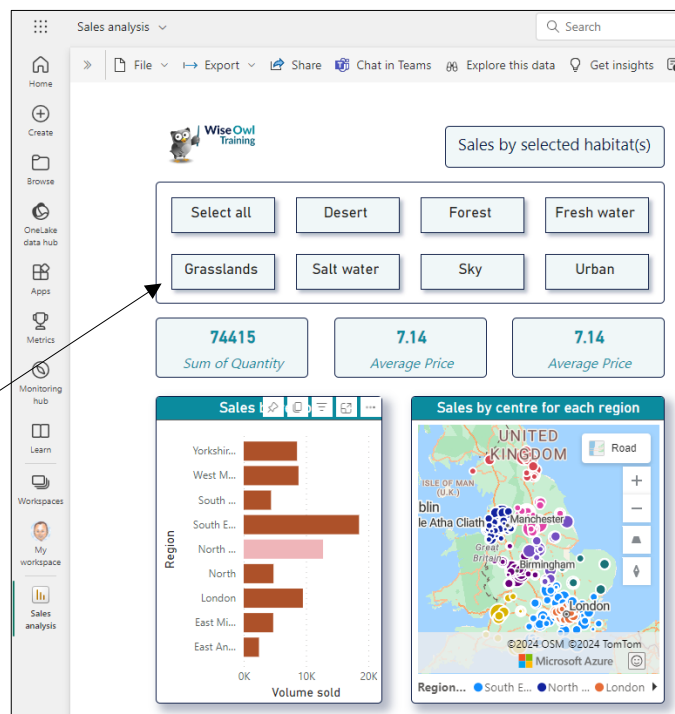
This report contains an image, a text box and 6 visuals (a slicer, 3 cards, a bar chart and a map).

The report is based on tables which we've imported into a *model*:



You can then publish these reports to the Power BI Service, allowing anyone who has a paid Power BI account to view them:

The same report as seen in Power BI Service through a browser.



1.2 Installing and Updating Power BI

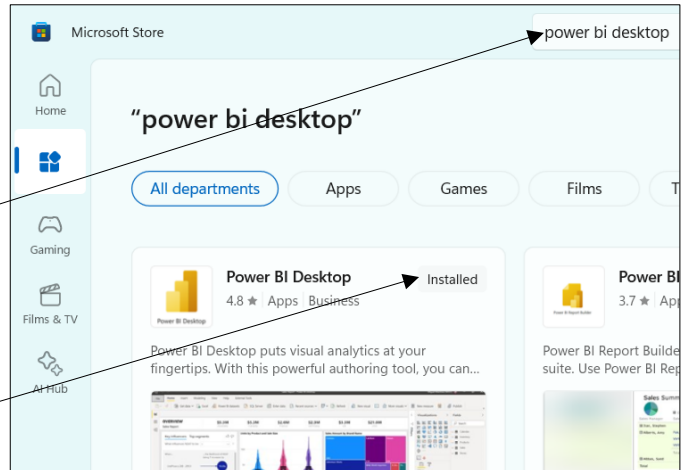
There are two ways to install Power BI, depending on whether you want to get automatic monthly updates.

From Microsoft Store

The easiest way to install Power BI is from the Microsoft Store:

- Type in **Power BI Desktop** in the *Microsoft Store* search bar.

- Choose to install the **Power BI Desktop** application (although in this case it's already installed on this user's machine).



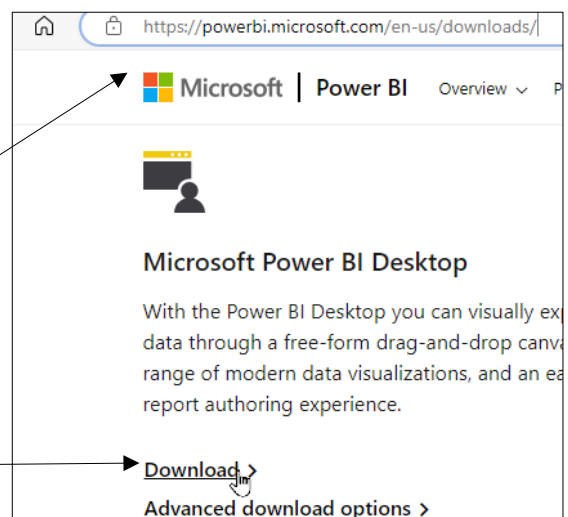
Every month Power BI will update automatically as Microsoft release new features. The best way to keep track of what these new features entail is to subscribe to the Wise Owl newsletter. This goes out at the start of each month and (among other things) summarises and explains any new updates to Power BI.

Installing without Automatic Updates

If you want to control when monthly Power BI desktop updates are installed on your computer, choose this installation option instead:

- Googling **install power bi desktop** should lead you to this page in your browser.

- Click to download the latest version of Power BI Desktop (it'll be up to you to update this manually to incorporate changes).



CHAPTER 2 - GETTING STARTED

2.1 Getting Started in Power BI Desktop

This chapter describes the basic workflow you'll use to build a report in Power BI Desktop:

Stage	Details
<i>Loading and transforming data</i>	Loading one or more tables from various data sources, cleansing the data and linking the tables together if necessary.
<i>Creating a report</i>	Using the data that you've loaded to create a report, including visuals like charts.
<i>Publishing this</i>	Publishing the results to your report server (usually Microsoft's Power BI Service) so that other people can view your reports.

You'll find much more detail on the ideas mentioned in this chapter in later parts of this courseware.

Example for this Chapter

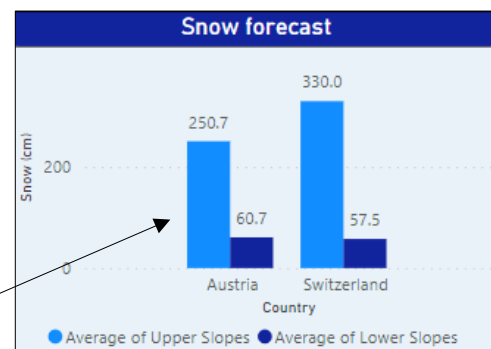
To demonstrate the basic process of building a report, we'll import a table of data from a webpage and create and publish a report based upon this:

AT A GLANCE SNOW REPORTS				
Sort By: Most Popular Resorts Uppers Slopes Lower Slopes Last Snowfall A-Z Country				
Resort	Country	Upper Slopes	Lower Slopes	Last Snowfall
St Anton snow reports	Austria	335cm	70cm	12cm
Ischgl snow reports	Austria	160cm	80cm	4cm
Obergurgl snow reports	Austria	159cm	85cm	1cm
Lech snow reports	Austria	335cm	70cm	12cm

At the time of writing these are the snow conditions at selected resorts courtesy of <https://www.igluski.com/snow-reports>. We'll *transform* the data to tidy it up (for example, we can remove columns we don't need).

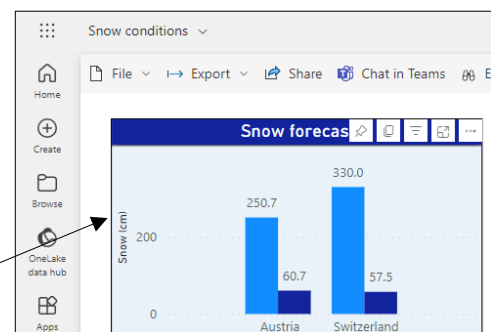
We'll then present this data using *visuals* such as this chart:

We can use the imported, cleaned data to create a variety of visuals, such as this chart.



Finally we will publish this report to the Power BI Service, so that anyone in your organisation can see it:

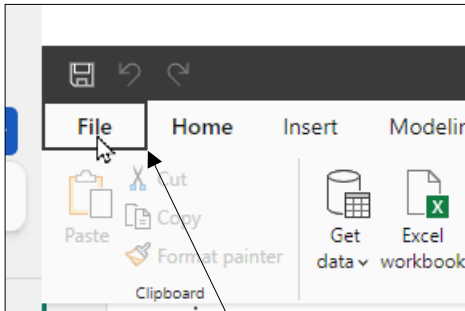
The final report published to Power BI Service, and viewed through your browser.



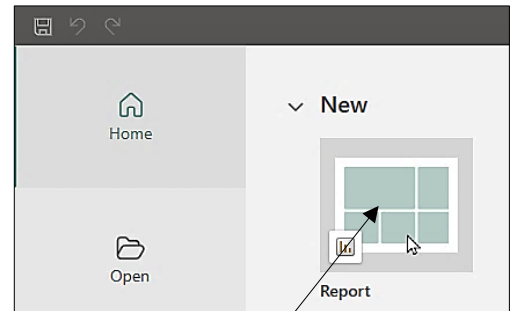
2.2 Working with Files

Creating New Files

You can create a new report in Power BI Desktop in the following ways:



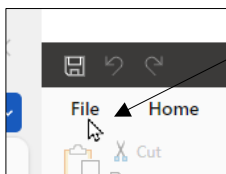
- a) If you already have Power BI Desktop open, select the **File** menu.



- b) Click on this icon to create a new report.

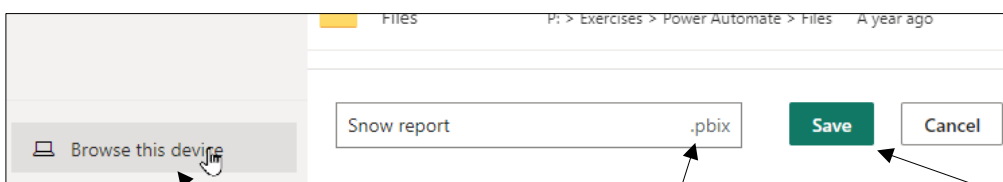
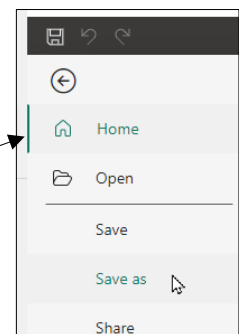
Opening and Saving Files

You can open and save files using options in the **File** menu:



- a) From the Power BI Desktop menu choose the **File** menu.

- b) Choose one of these menu items to open or save a report (the dialog box which appears is similar whichever you choose).



- c) Click on this button to find the folder which contains (or will contain) your report.

- d) Files that you save in Power BI Desktop will have a **pbix** extension.

- e) Click on this button to open the report you've chosen or to save this report



Every time you open a Power BI Desktop report a new instance of the application will launch, leaving the current report you're working on unaffected. To close a report you must close down the Power BI Desktop application containing it (there is no option to close a report but still leave Power BI Desktop running).

2.3 Views in Power BI Desktop

The most important components of the *Power BI Desktop* screen are as follows:

These tools allow you to switch between the 3 main views in Power BI Desktop: **Report** view, **Table** view and **Model** view.

This is the Power BI Desktop menu and ribbon.

You can use the *Pane Switcher* to change what to look at. The two main views are **Data** and **Format**, as explained below.

These tools allow you to switch between designing reports for viewing on desktop computers or mobile phones.

You can use the slider to zoom in and out, although you may find it easier to hold down the **Ctrl** key and use your mouse wheel instead.

Switching Panes

You can use the icons on the right-hand side of your Power BI screen to choose what to show:

Click on this icon to see the data tables in your model ...

... or this icon to see the format properties of the thing you currently have selected (in this case a chart visual).

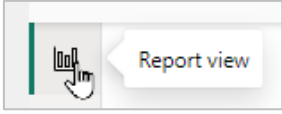
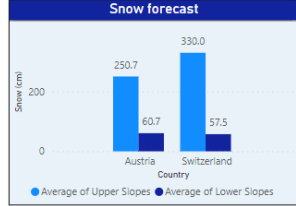

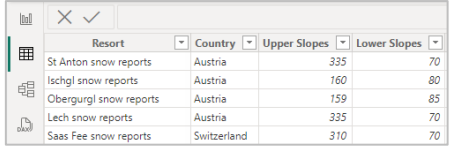
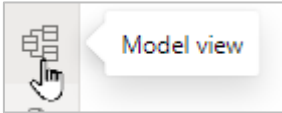
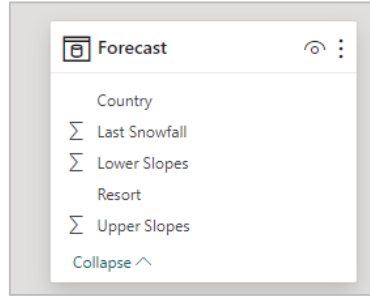
You can also use these tools on the **View** tab of the Power BI Desktop ribbon to choose what you want to view.

Click on this icon to see the data tables in your model ...

... or this icon to see the format properties of the thing you currently have selected (in this case a chart visual).

Report, Table and Model View

You can switch between the three views of a report using the tools on the left of the screen:

View	Icon	What it shows	Example view
Report		The report that you're creating, consisting of visuals and shapes.	
Table		The tables of data that you've loaded into your model (you can see one table at a time in this view).	
Model		The links between the tables in your model, called <i>relationships</i> in Power BI Desktop.	



The 4th icon – if present – allows you to create queries in DAX to interrogate the data upon which your report is based, but this is definitely not something to consider in this courseware chapter!

2.4 Getting Data

The first stage in building a report is to find some data!

a) From the ribbon, choose **Home | Get Data** then choose a type of data source. Here we're choosing a **Web** source.

b) Each type of data source requires different information to allow your report to connect to it. For a web source you need to enter the URL of the page and then click **OK**. You may also be asked to enter credentials if the website requires some.

c) Tick which table you want to import from this page (the best way to see what each looks like is to click on it).

d) Click on this button to load the data into your model.

Column1	Column2	Column3
Resort	Country	Upper Slopes
St Anton snow reports	Austria	335cm
Ischgl snow reports	Austria	160cm
Obergurgl snow reports	Austria	159cm
Lech snow reports	Austria	335cm
Saas Fee snow reports	Switzerland	310cm
Flims Laax snow reports	Switzerland	350cm
Zurs am Ariberg snow reports	Austria	335cm
Solden snow reports	Austria	283cm
Zell am See snow reports	Austria	148cm

You can optionally rename a table after importing it into your report:

a) Click on this icon to show the **Data** pane.

b) Choose **Rename** from the menu which appears.

c) Enter a new name for your table and press **Enter**.

2.5 Transforming Data

You'll often need to make changes to the data you have imported so that it can be presented easily in visuals. This process is known as *transforming* data.

Column1	Column2	Column3	Column4	Column5
Resort	Country	Upper Slopes	Lower Slopes	Last Snowfall
St Anton snow reports	Austria	335cm	70cm	12cm
Ischgl snow reports	Austria	160cm	80cm	4cm
Obergurgl snow reports	Austria	159cm	85cm	1cm
Lech snow reports	Austria	335cm	70cm	12cm
Saas Fee snow reports	Switzerland	310cm	70cm	1cm
Films Laax snow reports	Switzerland	350cm	45cm	1cm
Zurs am Arlberg snow reports	Austria	335cm	70cm	12cm
Sölden snow reports	Austria	283cm	30cm	1cm
Zell am See snow reports	Austria	148cm	20cm	1cm



We will change the column headings, turn some column into numbers and remove the final column.

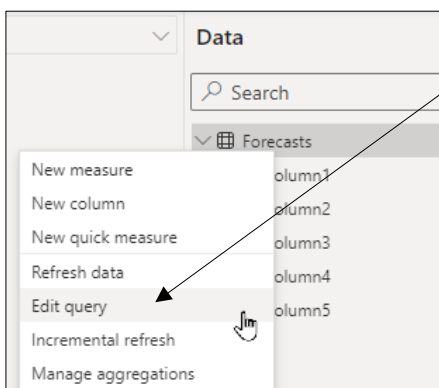
1	2	3	4
Resort	Country	Upper Slopes	Lower Slopes
1 St Anton snow reports	Austria	335	70
2 Ischgl snow reports	Austria	160	80
3 Obergurgl snow reports	Austria	159	85
4 Lech snow reports	Austria	335	70
5 Saas Fee snow reports	Switzerland	310	70
6 Films Laax snow reports	Switzerland	350	45
7 Zurs am Arlberg snow reports	Austria	335	70
8 Sölden snow reports	Austria	283	30
9 Zell am See snow reports	Austria	148	20



As with everything else in this chapter, we will go into this topic in much more detail later in this courseware.

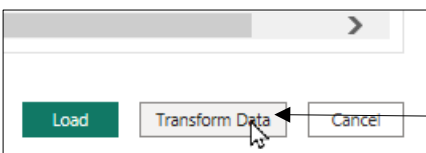
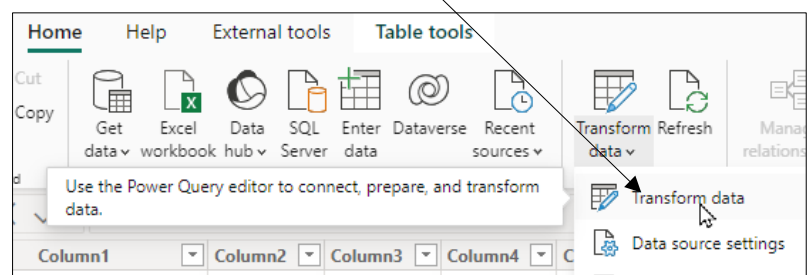
Editing Queries / Transforming Data

Each table that you import into a report generates a *query* which tells Power BI Desktop which data to get (and how to get it). You can edit these queries in (at least) 3 different ways:



You can right-click on a table in the **Fields** pane and choose **Edit query...**

...or you can choose this option from the **Home** tab of the ribbon (although it says it's doing something different, transforming data and editing a query are actually the same thing!).



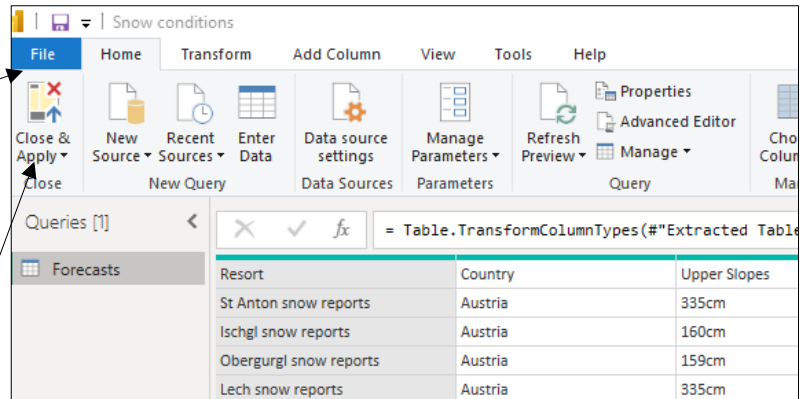
Alternatively, you could click on this button at the point at which you're first loading data to go directly into the Power BI Query Editor.

The Power BI Query Editor

Choosing to edit a query as described above opens the *Power Query Editor* tool within Power BI Desktop.

Although you're still working in the same Power BI Desktop file, the Power Query Editor has a different ribbon with options related to modifying data.

When you have finished cleaning your data click **Close & Apply** to close the Power Query Editor.



*This program to edit Power BI queries has gone by many names in the past! This courseware will call it **Query Editor**, although this name seems to have been abandoned by Microsoft. Little known fact: everything that you can do using Query Editor in Power BI Desktop you can also do when getting data in Excel.*

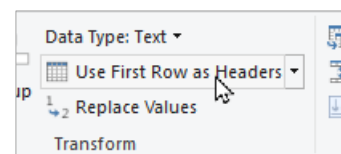
Promoting Row Headers

For our example the first thing you need to do is to make the first row your table headers:

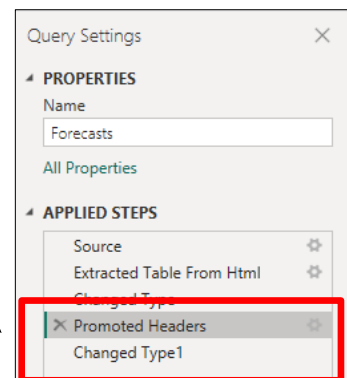
	Column1	Column2	Column3
1	Resort	Country	Upper Slopes
2	St Anton snow reports	Austria	335cm
3	Ischgl snow reports	Austria	160cm

	Resort	Country	Upper Slopes
1	St Anton snow reports	Austria	335cm
2	Ischgl snow reports	Austria	160cm

- a) To tell Power BI Desktop to use the first row of the table as column headers, click on this tool on the **Home** tab of the Query Editor ribbon:

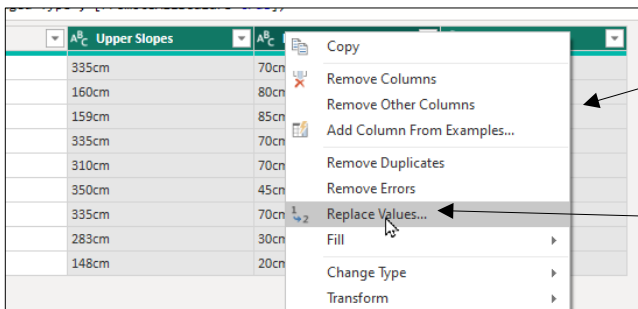


- b) Query Editor will add two steps: one to promote your row headers (as requested), and then another to change the data types of the columns following this step. Query Editor will often insert silent additional steps like this to second-guess your intentions, and (to be fair) nearly always gets these right.



Replacing Values

To allow us to average snowfalls for our data we need to remove the **cm** suffices then convert the resulting data to integer numbers:



a) Select the first column whose **cm** suffices you want to remove, then hold down the **Shift** key and select the last one (this is the easiest way to select multiple columns in Query Editor).

b) Right-click on the selected columns and choose to replace values.

Replace Values

Replace one value with another in the selected columns.

Value To Find

A^BC

cm

Replace With

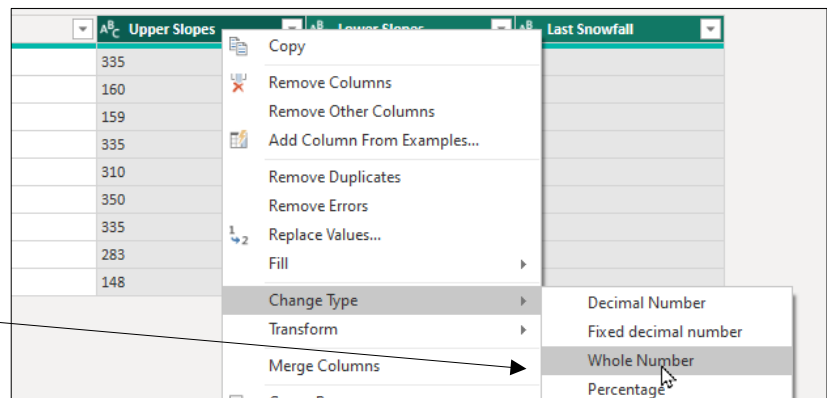
A^BC

c) Choose to replace the text **cm** with nothing, then select **OK**.

Changing Data Types

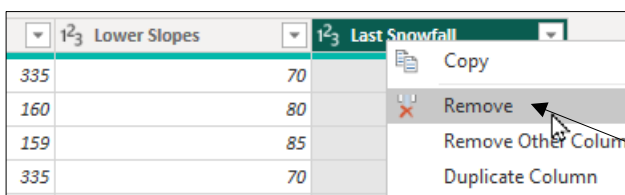
You can now change the data types of the 3 columns you have selected:

Right-click on the 3 columns and choose to change their data types to **Whole Number** (note that this would have generated errors if we had done this earlier).



Removing Columns

Finally, we're not interested in the last snowfall depth, so we'll remove this column.



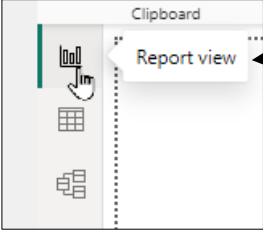
Right-click on the **Last Snowfall** column and remove it from your query.

2.6 Creating Visuals

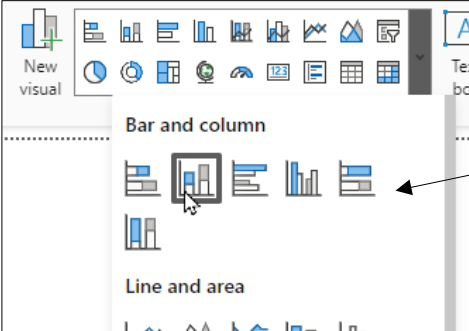
Visuals are the tables, charts or other gizmos which display the data in your report. There are many types of visual (you'll learn a lot more about them in later chapters of this courseware).

Inserting a Visual


Probably the easiest way to add a visual to a report is as follows:



a) Make sure that you're in **Report** view, otherwise you won't be able to add visuals!



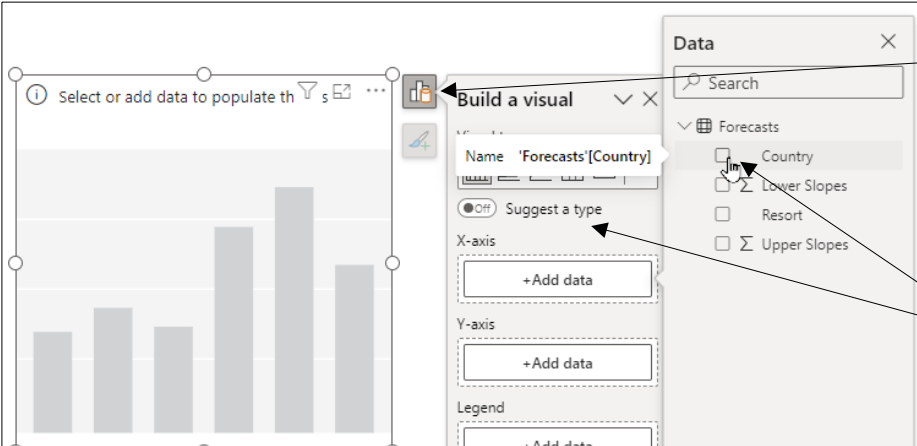
b) Click on the side bar to the right of the visuals pane (this appears on both the **Home** tab and the **Insert** tab of the ribbon).



b) Choose which visual you want to create. If you get this wrong, you can always change it after creating your visual by clicking here:

Assigning Grouping Fields to a Visual

Once you have inserted a visual you can begin assigning fields to it:

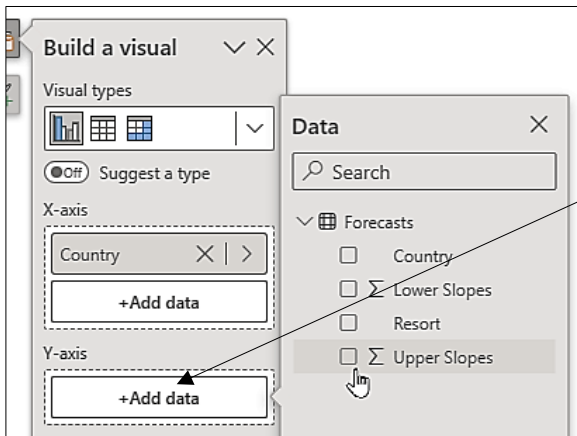


The easiest way to assign fields to a visual is to click on this tool.

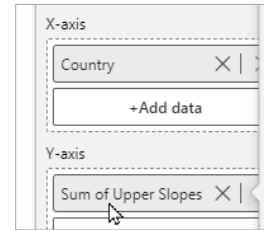
You can then click on each part of a chart (here we're saying what will appear on the horizontal axis of this column chart) then tick the field you want to include.

Assigning Numerical Fields

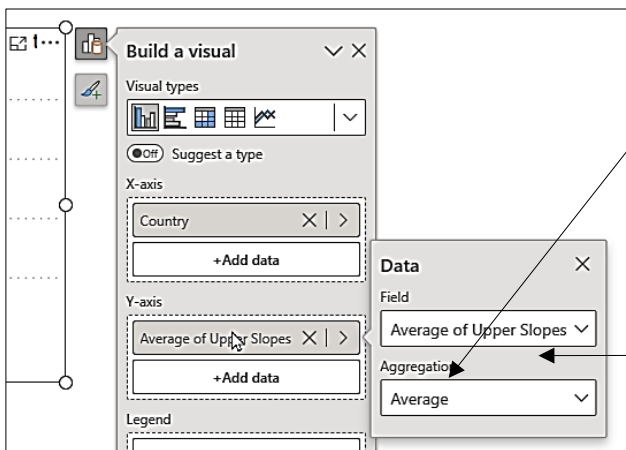
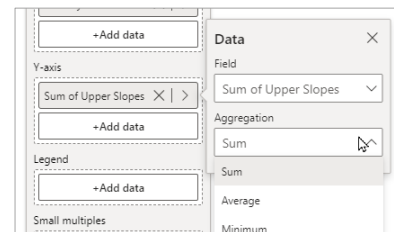
You can assign numerical fields in the same way, then change how you want to aggregate them:



- a) Click on the **Y axis** box the field well and choose to show the **Upper Slopess** snow depth to get this:



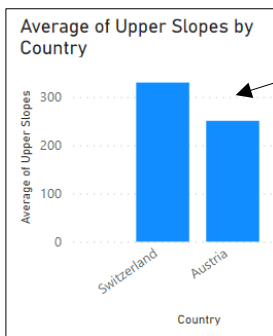
- b) Click on the field you've added and change it:



- c) Once you've assigned a numerical field to a chart you can click on it to say how you want to aggregate it (here we've changed from summing the upper slopes' snow depth for each country – which would be fairly meaningless – to averaging it).

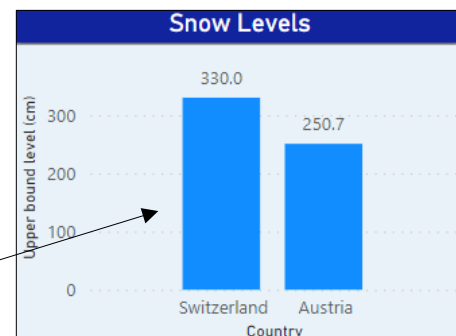
2.7 Three Ways to Format Visuals

Much of your time in Power BI Desktop will probably be spent applying formatting like this:



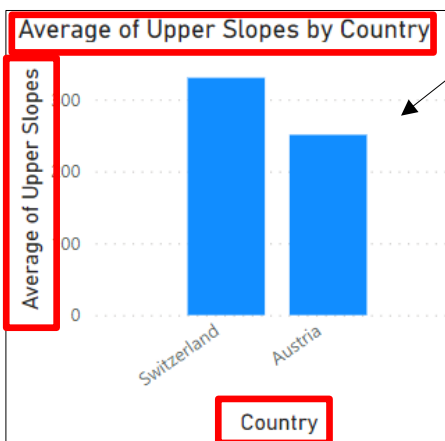
The chart as it initially appears – the title is hard to read and doesn't stand out, and it could do with a bit of oomph.

A chart which has been formatted within an inch of its life (including the addition of data labels showing the average upper bound snow level by country).



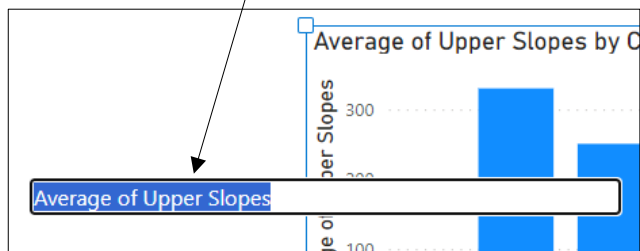
In Situ Selection

There are a few parts of a chart that you can edit on the chart itself:



The parts of the chart you can edit directly are shown in red boxes.

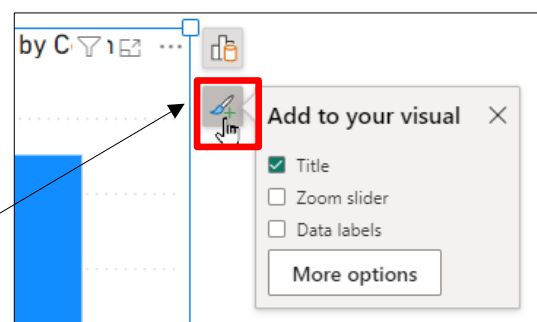
When you double-click on any of these with the chart selected you will be able to change the text displayed.



Changing what's on your Chart

You can choose to add or remove some parts of your chart using the following icon:

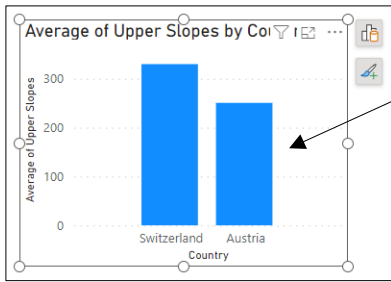
Click on this icon to add or remove certain chart components (here we can add or remove the title, data labels or a slider).



*The **More options** button is less useful than you might think: it just takes you to the **Format** pane on the right-hand side of Power BI Desktop.*

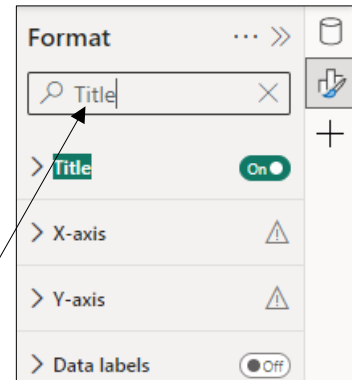
The Format Pane

You'll spend much of your time in Power BI Desktop using the **Format** pane:

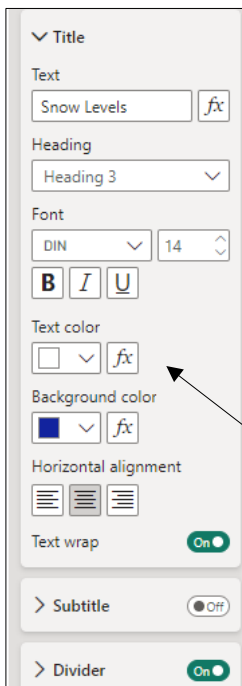


a) Select the visual you want to format (otherwise you'll see the formatting properties of the page to which it belongs instead).

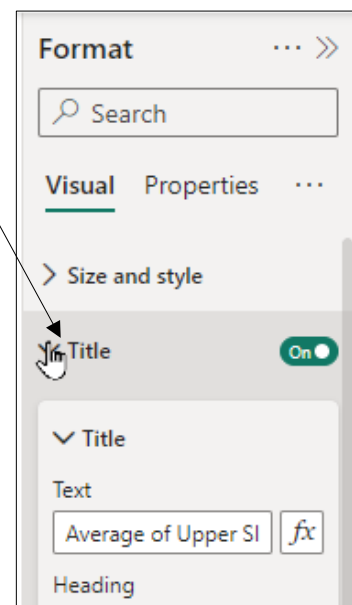
b) Optionally, reduce the number of properties displayed by typing in part of the name of the one you want to change (here we've typed **Title** in the search box).



c) Expand a card to show its range of formatting options, and make changes.



d) Some of the changes made to change the title to this:



*As a short-cut, double-click on a visual to select any part of it that you want to format; the relevant card will automatically then be selected in the **Format** pane.*

2.8 Publishing your Report

When you've finished your report you will probably want to share it!

a) Check that you're signed in to a Power BI account.

b) Click on this **Publish** button on the **Home** tab of the Power BI ribbon.

c) If you have unsaved changes you will be asked at this point to save them (you can't publish a report which contains unsaved changes).

d) Choose to publish to the default **My workspace** (see hint below for more on this).

e) Click on this link to see your report in Power BI Service on the Internet (you may be asked to log in to your account again at this point).

f) Your report as it will appear to the world (provided of course that they have the right security level and licence ...).



A (much) later chapter in this courseware will cover publishing in more detail, including an explanation of workspaces (and why you might want to create them), how to create dashboards and much more besides.

Blank lined paper for writing.



Handwriting practice lines consisting of 24 horizontal dotted lines.



Blank lined area for writing.



Blank lined paper for writing.



WiseOwl
Training

Blank lined paper for writing.



WiseOwl
Training

Blank lined paper for writing.



Wise Owl
Training

Blank lined paper for writing.



Wise Owl
Training



Blank lined paper for writing.






































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WiseOwl
Training

What we do!

		Basic training	Advanced training	Systems / consultancy
Office	Microsoft Excel			
	VBA macros			
	Office Scripts			
	Microsoft Access			
Power BI, etc	Power BI and DAX			
	Power Apps			
	Power Automate (both)			
SQL Server	SQL			
	Reporting Services			
	Report Builder			
	Integration Services			
	Analysis Services			
Coding	Visual C#			
	VB programming			
	MySQL			
	Python			



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