Intro to Data Science
Descriptive Analytics for Business

1 Key Metrics Analysis

Key Metrics or Key Performance Indicators (KPIs) are the main method that we use to measure the performance of a company, division, department or team. Key Metrics provide an overall understanding of how the business is performing. Key Metrics usually include the following types of questions:

a) What is the Total Sales?

b) What is the Total Profit?

c) What is the Profit Ratio?

d) How many transactions were there processed?

e) What was the average Sales amount?

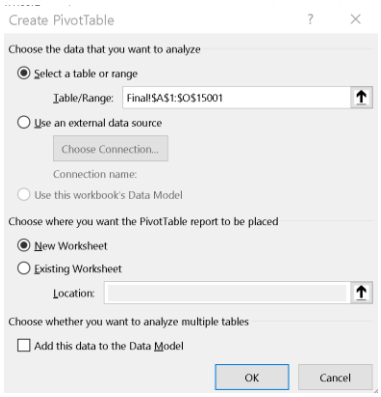
f) What was the highest Sales amount?

g) What was the lowest Sales amount?

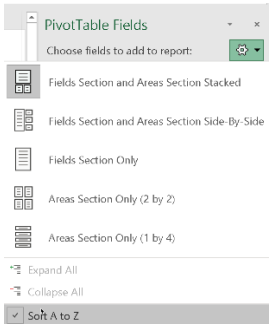
File to use: `SalesData-v1.xlsx`

Create a Pivot table from the current range of data.
Make sure you have selected a cell in the range.
Insert -> Pivot table
The Create Pivot table should automatically detect the complete range of cells with valid values.

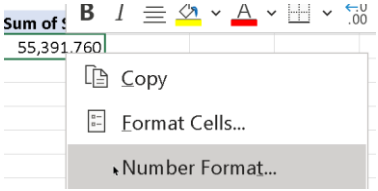
Make sure you create the Pivot table in a new worksheet.

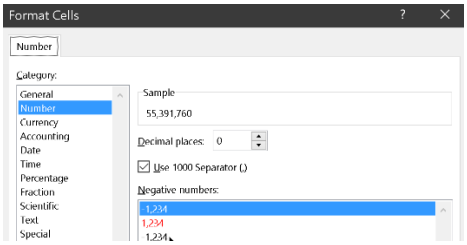


You can change the order of the Pivot Table fields as they appear in the main list: its sometimes useful to sort them in alphabetical order if you have many fields.

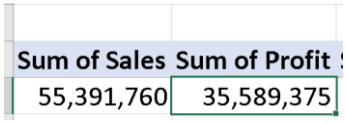


Select the Sales field to get the Sum of Sales, then perform a Number Format to make it easier to view.

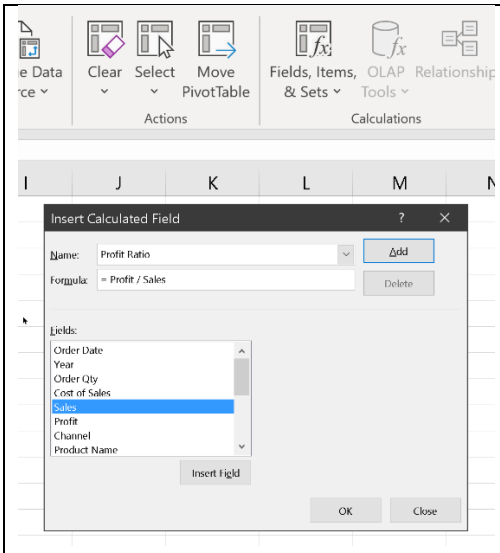


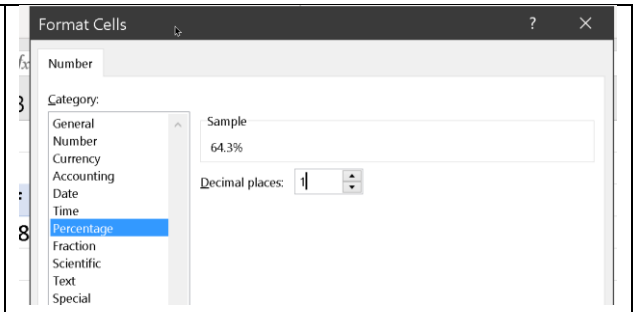


Repeat this with the Profit field to get the Sum of Profit, with a similar Number Format as well.



We can now create a Calculated Field to obtain the Profit Ratio.
With at least once cell selected in the pivot table, select Pivot Table Analyze from the top main menu, select Fields, Items and Sets
Next insert a Calculated Field to obtain the Profit Ratio, and format the result accordingly

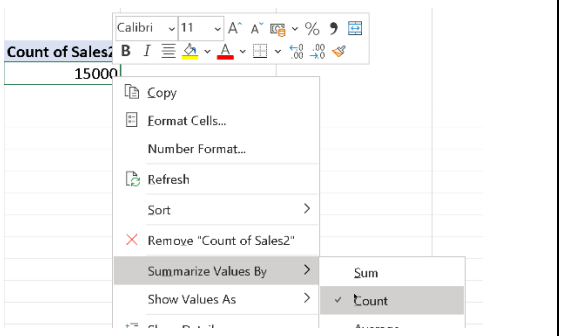




Sum of Sales	Sum of Profit	Sum of Profit Ratio
55,391,760	35,589,375	64.3%

To count the number of transactions, we would typically use a unique Sales ID, which we don't have here in this dataset. We can initially use the Sales Field to start with (drag and drop into the Values area to obtain a new Sum of Sales 2).

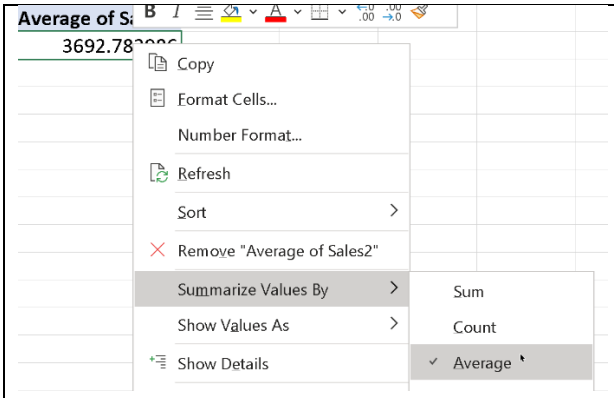
Then select this cell and from the context menu, change it to Summarize Values by Count to get the actual number of transactions (which we can also double confirm from the source dataset)



Sum of Sales	Sum of Profit	Sum of Profit Ratio	Count of Sales2
55,391,760	35,589,375	64.3%	15000

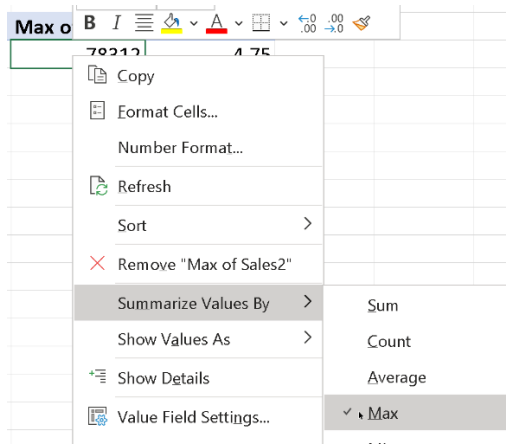
To get the average Sales, use the Sales field again in the same manner (drag and drop into the Values area to obtain a new Sum of Sales 2).

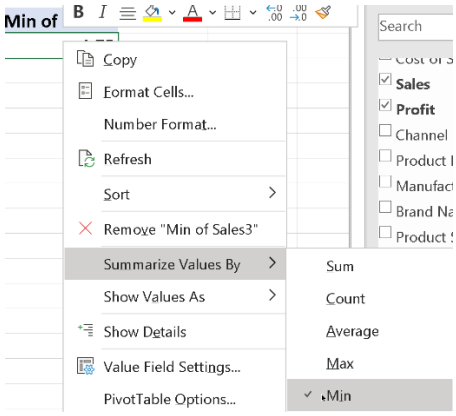
Then select this cell and from the context menu, change it to Summarize Values by Average to get the average Sales value, then format it accordingly.



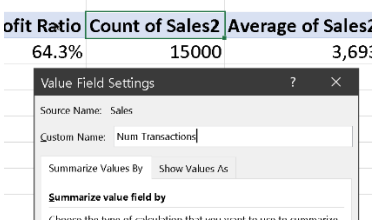
Count of Sales2	Average of Sales2
15000	3,693

Add two more Sales Fields into the Values area in a similar manner as previously, and then perform a Summarize Values by Min and Max for these two new fields and format them appropriately.





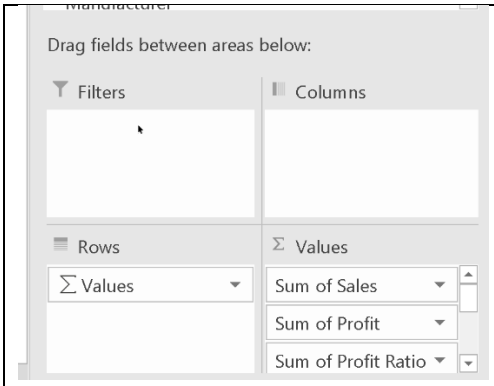
Now that we have all our numbers, you can double click on any (or all) of the field headers to change the field names to something more appropriate if you wish.



We now have our key metrics listed out in a row:

Sum of Sales	Sum of Profit	Sum of Profit Ratio	Num Transactions	Average of Sales	Highest Sales	Lowest Sales
55,391,760	35,589,375	64.3%	15000	3,693	78312	5

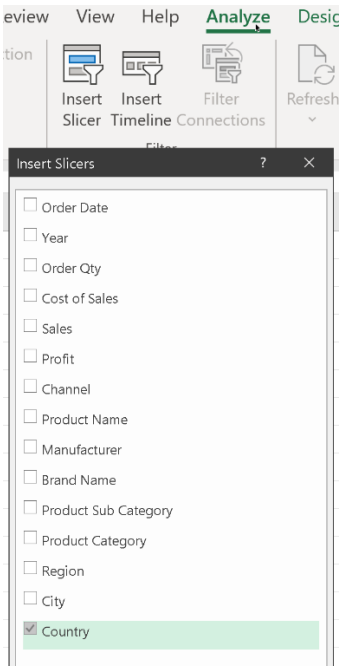
You can transpose the rows and columns for a better layout:



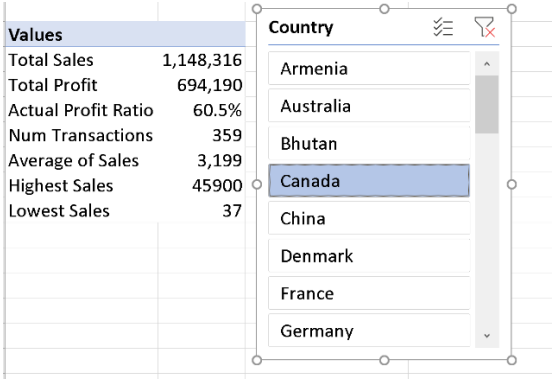
Values	
Total Sales	55,391,760
Total Profit	35,589,375
Actual Profit Ratio	64.3%
Num Transactions	15000
Average of Sales	3,693
Highest Sales	78312
Lowest Sales	5

To zoom in and get more details on the metrics based on a certain category (for e.g. country), we can filter the table to decide which subset of records to apply the various aggregation operations we have performed so far on.

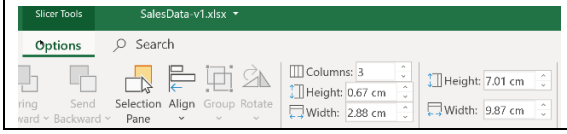
For this purpose, we can use a slicer. Go to Pivot Table Analyze -> Insert Slicer, and select Country. You can then select particular countries from the slicer drop down to get the metric values only for sales records related to that particular country.



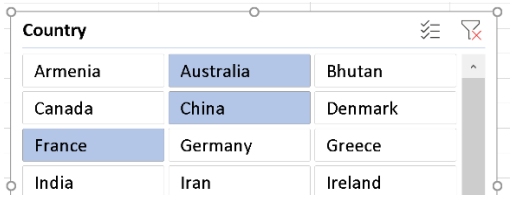
Values	
Total Sales	1,148,316
Total Profit	694,190
Actual Profit Ratio	60.5%
Num Transactions	359
Average of Sales	3,199
Highest Sales	45900
Lowest Sales	37

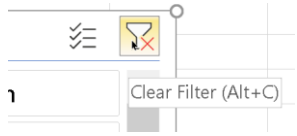


With the slicer selected and then selecting the Slicer option in the main menu, you can fine tune the slicer by adjusting the number of columns, as well as their height and width (you can just click and drag on the slicer itself to manually change this) to make them easier to work with:

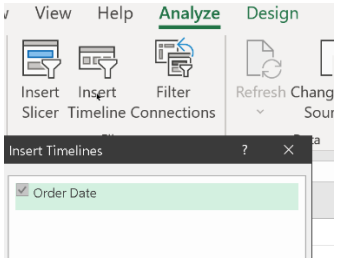


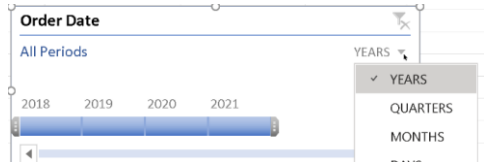
You can use the Ctrl+Left mouse click to select multiple countries at the same time, so the aggregation operations will apply to all these countries. You can then select the clear Filter button to clear the filter and make the aggregation apply to the entire dataset.



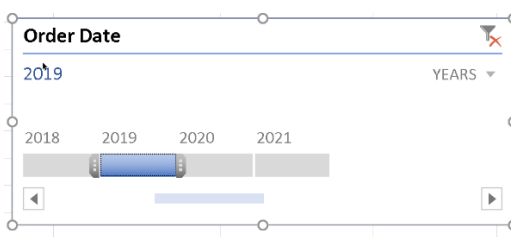


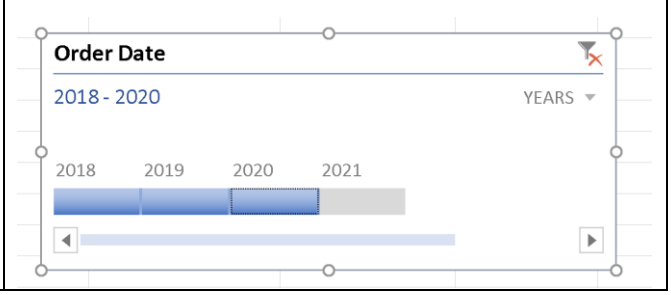
You can now also insert a Timeline and decide which particular period (Years, Quarters, Months) to examine.



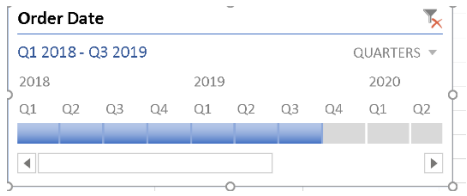


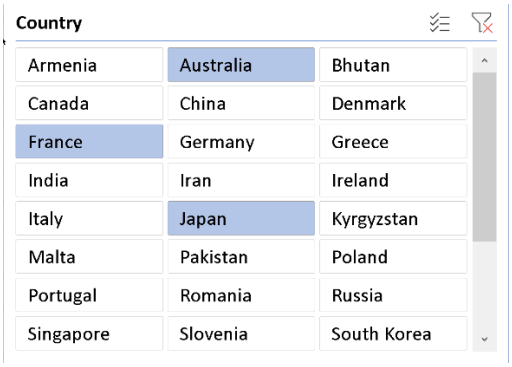
You can select a particular period or a range of periods (Shift-Click):



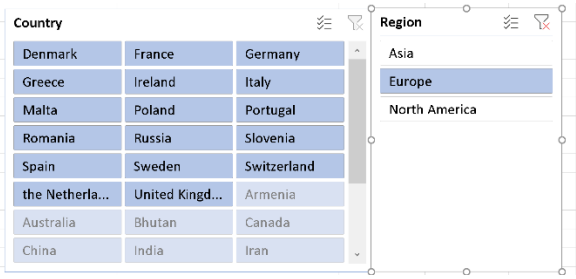


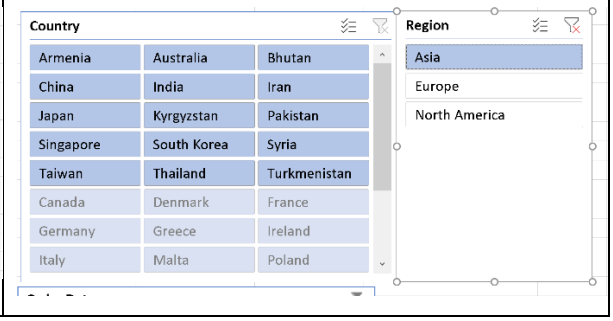
You can also select items from both filters to combine their filtering action together, for e.g. to perform aggregation operations on a specific country (or group of countries) over a specific period of time.



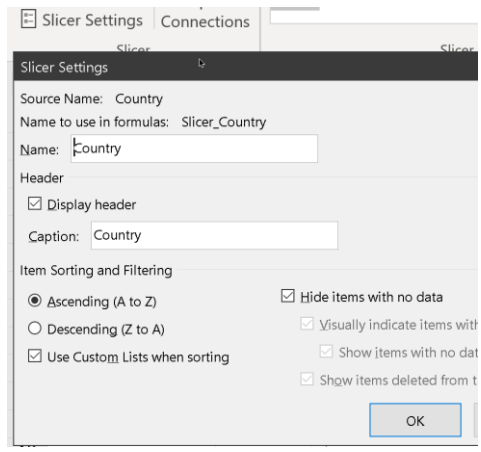


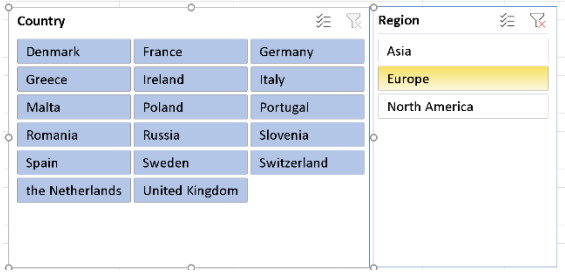
You can introduce another slicer for Region, and notice that selection of items in either slicer for Country or Region will influence the other: based on which countries are included in which region. To see this properly in effect, you will have to clear the filter in either one or both of the slicers.





You can also set the Slicer Settings to only clearly show the countries within a particular region, and not just grey out the countries that are not in that region (to make the analysis even more clearer):





1.1 Practical Exercise for Key Metrics Analysis

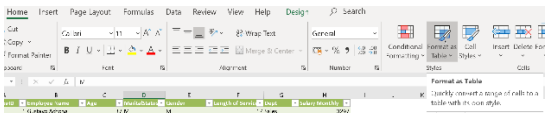
File to use: `Employee-v1.xlsx`

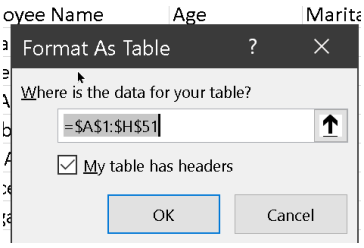
Analytical activities to perform:

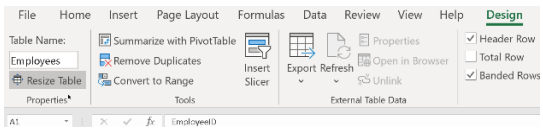
1. How many employees are in John's company?
2. What is the average age of the employees?
3. What is the highest age at the company?
4. What is the lowest age at the company?
5. What is the average Length of Service?
6. What is the longest Length of Service?

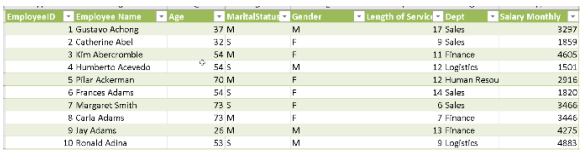
Drill down further into this information based on the following categories: Dept and Gender

You can initially format the range of cells of the original data set as a table to make it easier to work with, and to create a Pivot Table. To do this, select a cell in the data range, go to Home -> Format as Table, format it and give it an appropriate name.

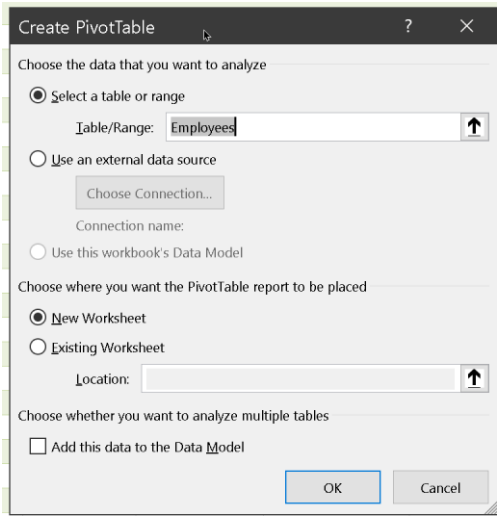








Once done, you can generate a Pivot Table in the usual way, but this time referencing the Table.



2 Comparison Analysis

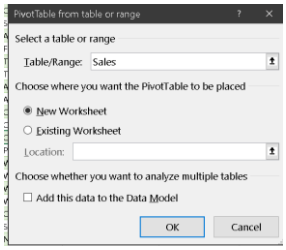
Comparison analysis is probably one of the most popular forms of analysis you're going to do. The focus is finding the magnitude of difference between values for different fields. Visualizing your data set makes it much easier to appreciate this as opposed to directly examining the values themselves.

Sample analysis

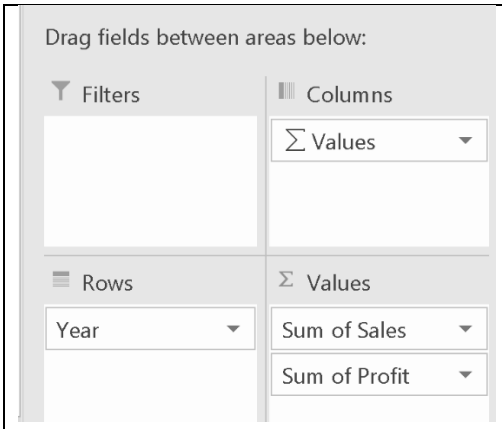
a) compare the sales and profit by year
b) compare the sales by manufacturer
c) compare the profit by product categories
d) compare the sales by product category and by channel
e) compare the profit by product subcategory and review that by different countries.
f) compare the sales and profit by the countries, and review that by different product sub categories

File to use: `SalesData-v2.xlsx`

Start off again by generating a Pivot Table in the usual manner that references the Sales table.

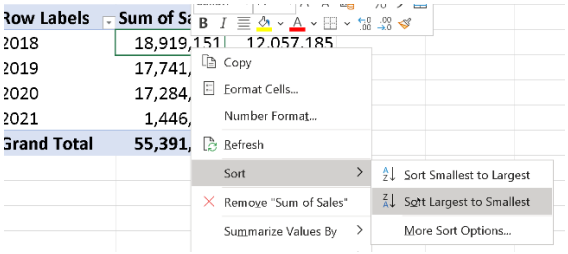


In this new Pivot table, obtain the Sum of Sales and Profit by Years (Rows) and format the cells with an appropriate numeric format (select all the cells -> Format Cells)

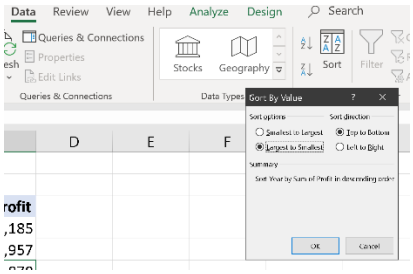


Row Labels	Sum of Sales	Sum of Profit
2018	18,919,151	12,057,185
2019	17,741,637	11,378,957
2020	17,284,124	11,237,878
2021	1,446,849	915,355
Grand Total	**55,391,760**	**35,589,375**

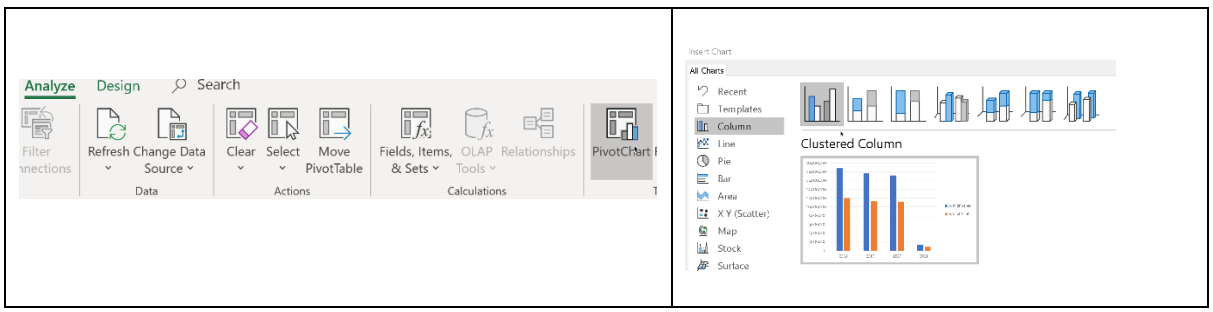
We can also sort on the Sum of Sales or Profit (either Smallest to Largest or vice versa)



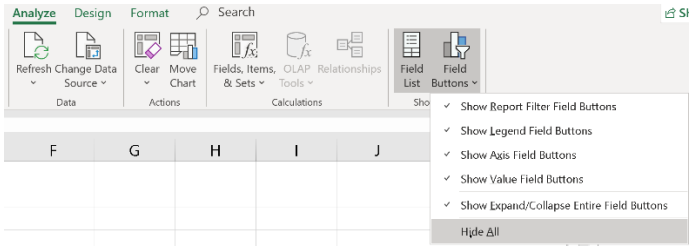
The sorting can also be done via the Sort option in the Data tab



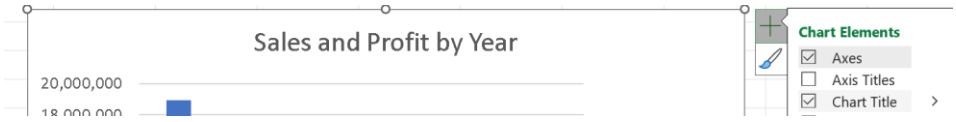
Sort in descending order for Sum of Sales, and visualize this via a Pivot Chart (choose Clustered Column)



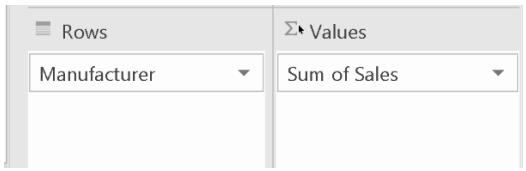
You can format what fields to be shown in the chart, including hiding everything:



You can also change the Chart Elements appropriately, for e.g. add in Title and moving the legend to the Top.

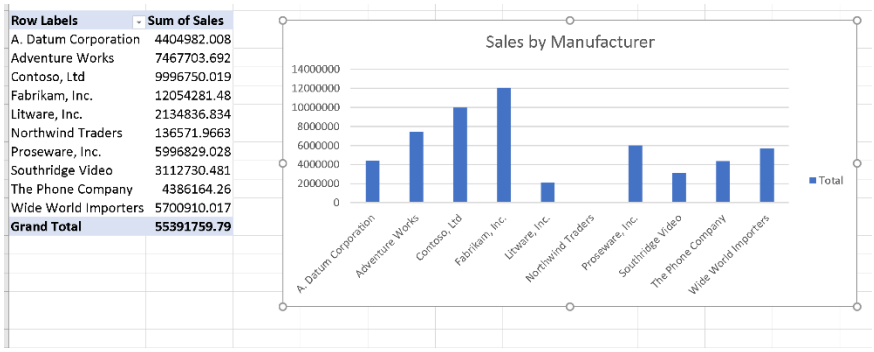


We can now create a new Pivot Table and repeat the earlier process to get the Sum of Sales by Manufacturer (Rows) and format the cells with an appropriate numeric format.

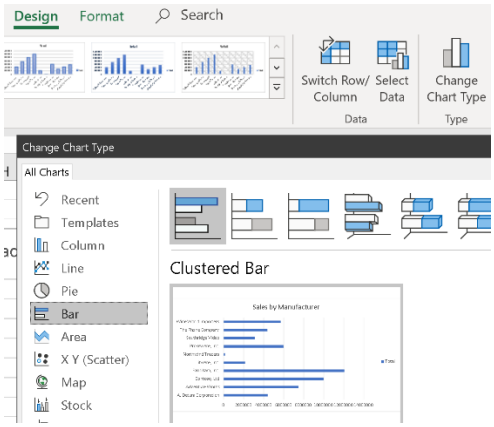


Row Labels	Sum of Sales
A. Datum Corporation	4404982.008
Adventure Works	7467703.692
Contoso, Ltd	9996750.019
Fabrikam, Inc.	12054281.48
Litware, Inc.	2134836.834
Northwind Traders	136571.9663
Proseware, Inc.	5996829.028
Southridge Video	3112730.481
The Phone Company	4386164.26
Wide World Importers	5700910.017
Grand Total	**55391759.79**

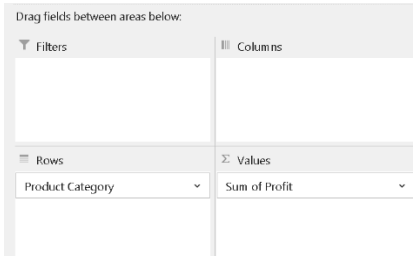
We can now insert another Clustered Column chart, and format it in the same way as we did previously.



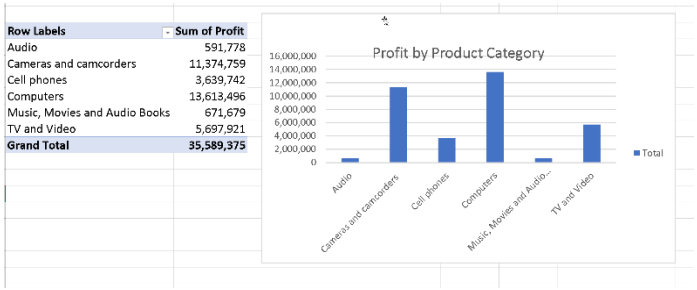
We can also opt to change the Chart Type to another type, for example Clustered Bar.



For the next analysis, we can again create a new Pivot Table and repeat the earlier process to get the Sum of Profit by Product Category (Rows) and format the cells with an appropriate numeric format

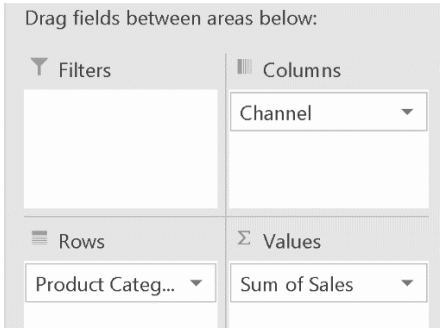


We can then generate the Pivot Chart (either Clustered Column or Clustered Bar).



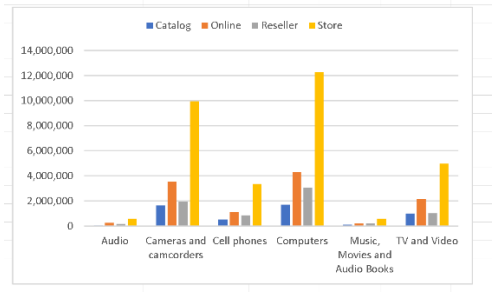
Row Labels	Sum of Profit
Audio	591,778
Cameras and camcorders	11,374,759
Cell phones	3,639,742
Computers	13,613,496
Music, Movies and Audio Books	671,679
TV and Video	5,697,921
Grand Total	**35,589,375**

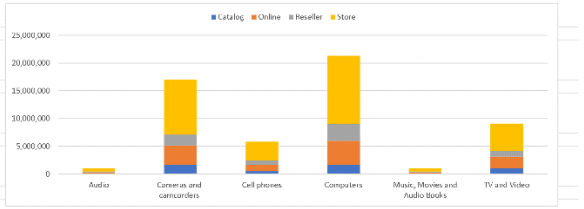
For the next analysis, we can again create a new pivot table and repeat the earlier process to get the Sum of Sales by Product Category (Rows) and Channel (Columns) and format the cells with an appropriate numeric format.



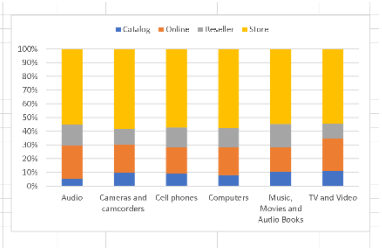
Sum of Sales	Column Labels				
Row Labels	Catalog	Online	Reseller	Store	Grand Total
Audio	53,274	248,765	159,539	567,803	1,029,381
Cameras and camcorders	1,641,341	3,514,850	1,933,395	9,959,345	17,048,932
Cell phones	527,490	1,114,245	845,416	3,354,004	5,841,156
Computers	1,682,876	4,290,928	3,045,515	12,287,652	21,306,971
Music, Movies and Audio Books	111,079	185,645	181,045	579,712	1,057,480
TV and Video	984,231	2,145,775	1,005,703	4,972,131	9,107,839
Grand Total	**5,000,291**	**11,500,207**	**7,170,614**	**31,720,647**	**55,391,760**

Then we could use either or both a Clustered Column chart and / or Stacked Column chart to view the differences.

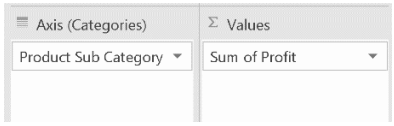




We could also use a 100% stacked column as well, which is useful for seeing how each of the different channels contribute for all products, regardless of the product total - this is useful for products whose sales totals are very small compared to other products and therefore will not come out clearly in the previous graphs.

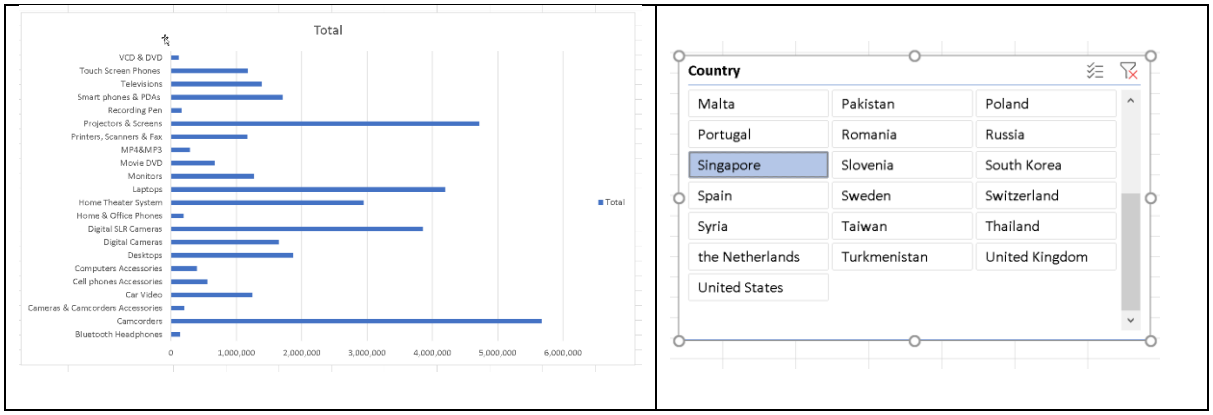


For the next analysis, we can again create a new pivot table and repeat the earlier process to get the Sum of Profit by Product Sub Category (Rows) and format the cells with an appropriate numeric format.

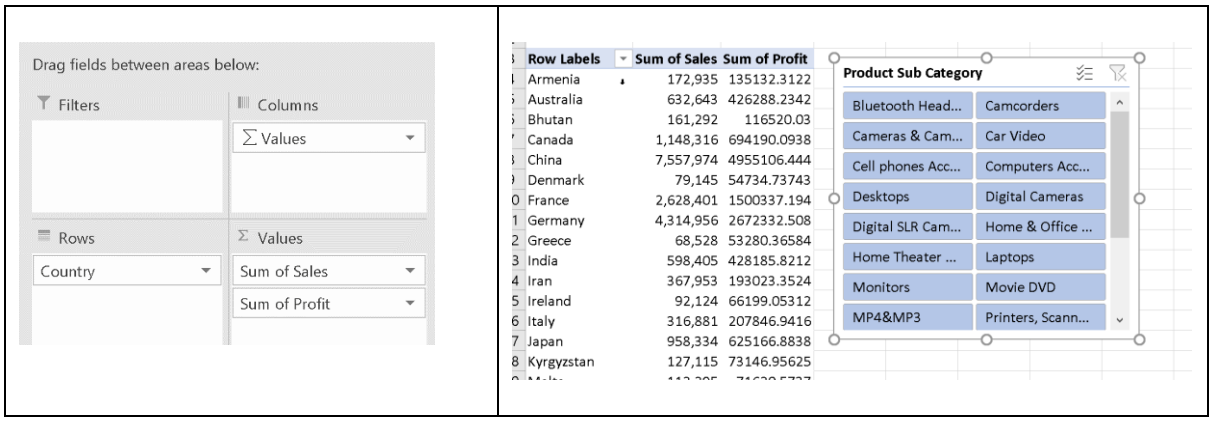


Row Labels	Sum of Profit
Bluetooth Headphones	142,887
Camcorders	5,670,098
Cameras & Camcorders Accessories	202,945
Car Video	1,243,947
Cell phones Accessories	558,835
Computers Accessories	395,441
Desktops	1,870,700
Digital Cameras	1,647,076
Digital SLR Cameras	3,854,640
Home & Office Phones	198,426
Home Theater System	2,946,634
Laptops	4,193,350
Monitors	1,268,828
Movie DVD	671,679
MP4&MP3	288,293
Printers, Scanners & Fax	1,167,342
Projectors & Screens	4,717,835
Recording Pen	160,597
Smart phones & PDAs	1,708,954
Televisions	1,388,547
Touch Screen Phones	1,173,528
VCD & DVD	118,793
Grand Total	**35,589,375**

Then we generate a standard Clustered Bar Chart as we have done before, and now we can also choose to use a slicer based on the Country field for the pivot table which will also dynamically affect the content of the chart which is linked to the same table.



For the next analysis, we can again create a new pivot table and repeat this earlier process to get the Sum of Sales and Profit by Country (Rows) and format the cells with an appropriate numeric format. Then insert a new Slicer based on Product Subcategory



2.1 Practical exercise for comparison Analysis

File to use: File to use: `SalesData-v3.xlsx`

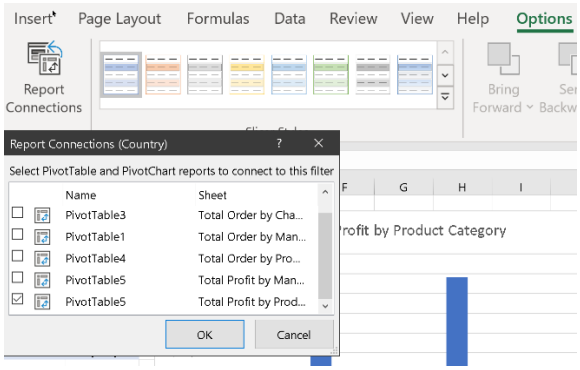
Analytical activities to perform:

1. What is the Total Order Quantity by Manufacturer?
2. What is the average Profit by Brand
3. Create a column graph displaying Total Order Quantity sold by Channel - review by Country
4. Create a bar graph displaying the Total Order quantity sold by Product Category - review by Region

Create two pivot graphs as per the instructions below. Filter both graphs by the Country and Year fields using a slicer.

5. Create a column graph displaying Total Profit by Product Category
6. Create a bar graph displaying Total Profit by Manufacturer

Note: While creating slicers, you can link a single slicer to multiple pivot tables on the same worksheet (if you decide to have more than one), using Report Connections in the Slicer Options.



3 Trend Analysis

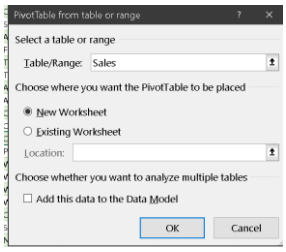
Trend analysis is all about understanding how data changes over time: is it moving up, is it moving down, is it staying stable or is it volatile. This can be accomplished mainly via trendlines. We also want to study these changes over different time frames: for e.g. changes over years, quarters, months, days. Again, this is best understood with some form of visualization.

Activities to be undertaken:

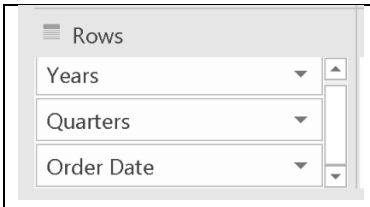
a) Understand the trend for sales by year and month
b) Understand the trend for sales by year and month by different product categories
c) Develop a seasonality graph displaying the sales by month

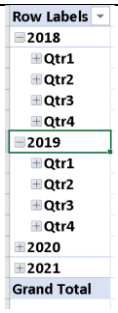
File to use: File to use: `SalesData-v4.xlsx`

Start off again by generating a Pivot Table in the usual manner that references the Sales table.

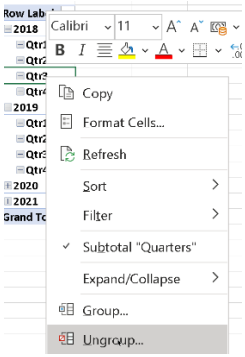


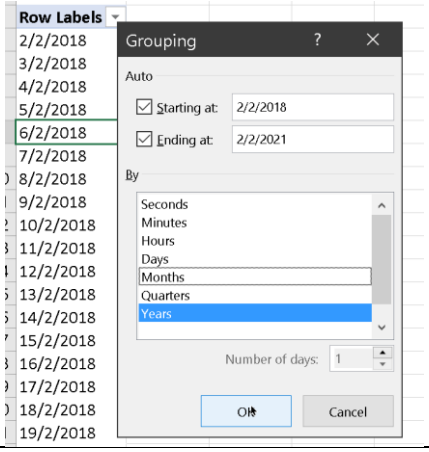
Adding Order Date to the Rows area results in Excel automatically creating a hierarchy involving Years and Quarters.



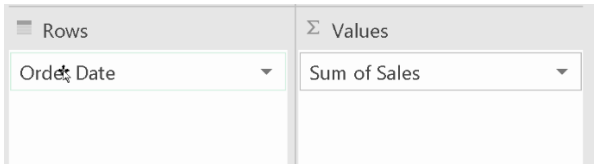


You can ungroup the hierarchy first before creating your own custom grouping



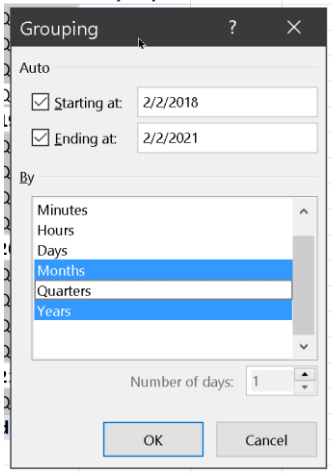


We can then continue to get Sum of Sales for each year



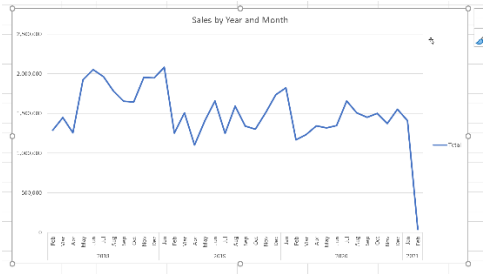
Row Labels	Sum of Sales
2018	18,919,151
2019	17,741,637
2020	17,284,124
2021	1,446,849
Grand Total	**55,391,760**

We can then alternatively change to another custom grouping (years / months)

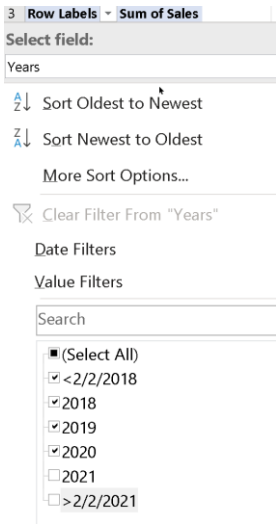


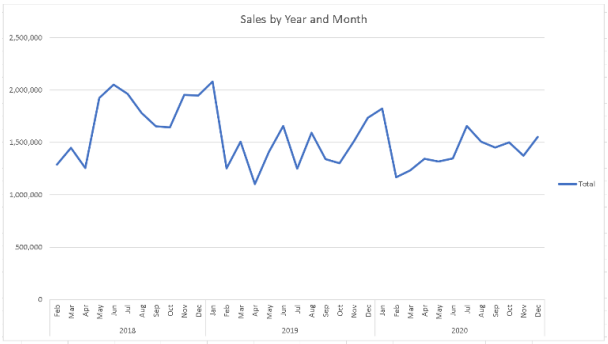
Row Labels	Sum of Sales
2018	18,919,151
Feb	1,289,552
Mar	1,448,250
Apr	1,256,708
May	1,923,673
Jun	2,051,973
Jul	1,965,917
Aug	1,781,769
Sep	1,654,111
Oct	1,643,812
Nov	1,955,526
Dec	1,947,858
2019	17,741,637
Jan	2,081,908

We will insert a Pivot Chart in the form of a Line Chart.

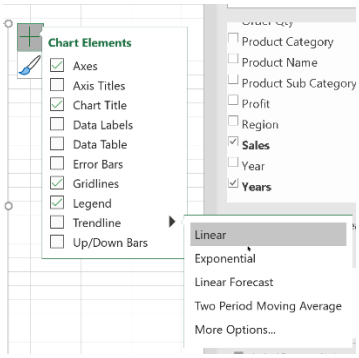


We can also filter out the first 2 months of 2021 to avoid issues with insufficient data at that point which will affect the trend analysis.



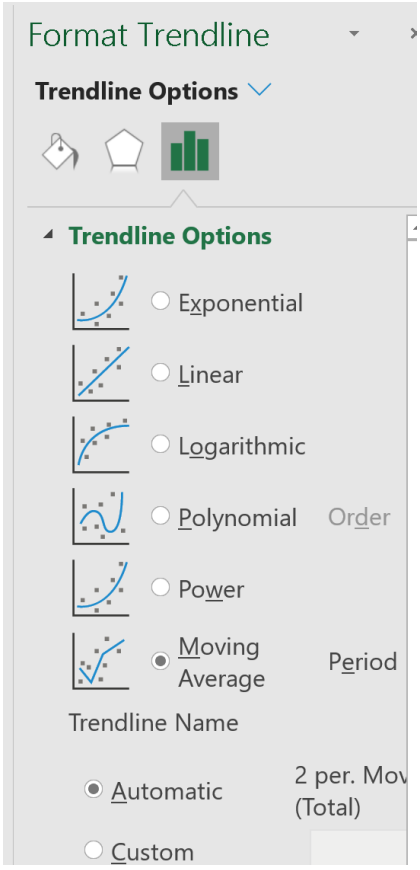


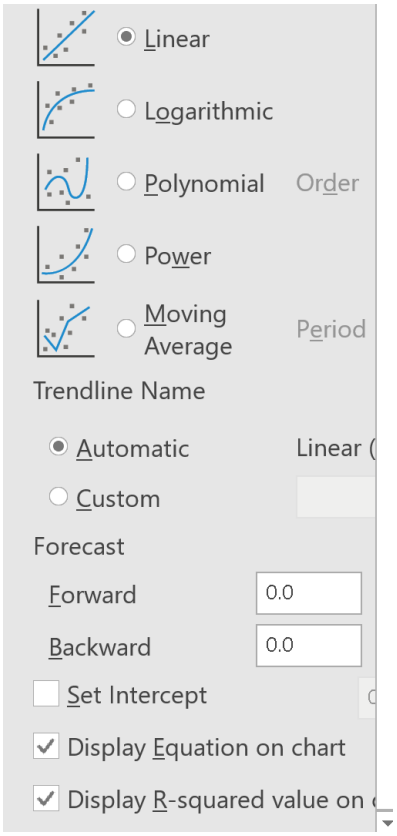
With a more proper graph, you can examine the various trend line options possible:



The first option is the default option which is linear. The rest (exponential, linear forecast) are quite similar, but not exactly the same. They are both using different algorithms to calculate what the trend line is. The two period moving average is basically taking two periods and it averages that value between the two periods. It tends to smooth the lines. Its not a trend line as such but tracking the shape of the sales lines.

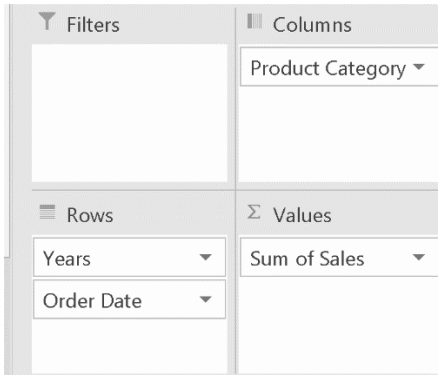
Selecting More Options leads to the Format Trend line menu, which provides a variety of options such as polynomial, exponential, etc.





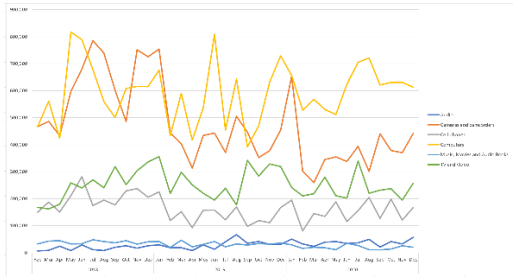
For a linear equation, you can display the trend line equation on the chart and calculate the R-squared, which is a measure of how accurate the predictions would be from the trend line equation.

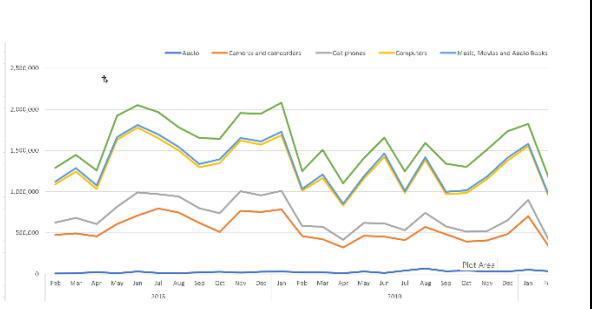
The next step is to refine this further to understand the trend for sales by year and month by different product categories. We can simply copy the existing pivot table to a new worksheet and work from there.



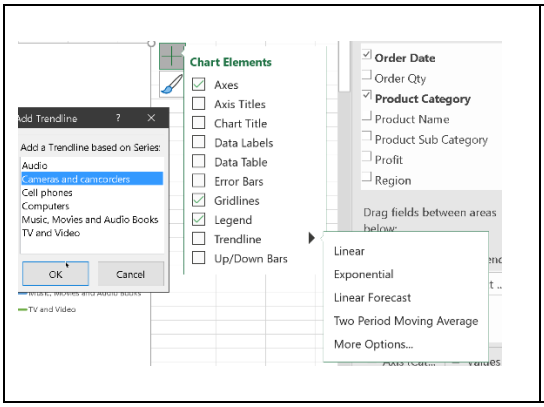
Sum of Sales	Column Labels						
Row Labels	Audio	Cameras and camcorders	Cell phones	Computers	Music, Movies and Audio Books	TV and Video	Grand Total
2018	182,424	6,750,412	2,196,698	6,635,135	426,434	2,728,048	18,919,151
Feb	6,504	466,840	149,413	466,647	32,341	167,806	1,289,552
Mar	8,254	486,074	187,716	561,066	42,948	162,191	1,448,250
Apr	24,332	433,028	150,856	424,247	44,795	179,451	1,256,708
May	7,940	597,172	210,988	816,645	32,167	258,762	1,923,673
Jun	29,136	679,810	281,364	789,193	32,827	239,643	2,051,973

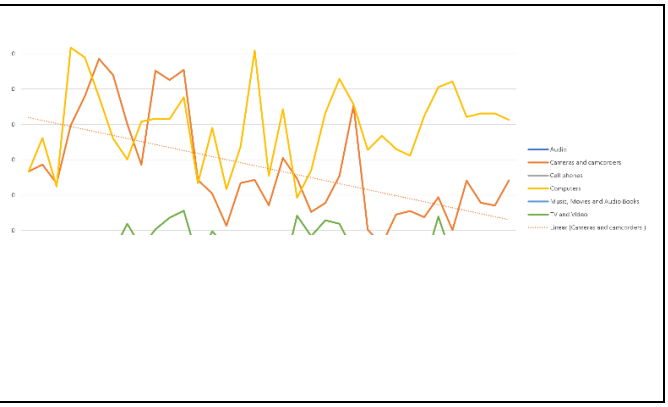
We can add a PivotChart that is a line chart and stacked line chart to get an initial view of this data.



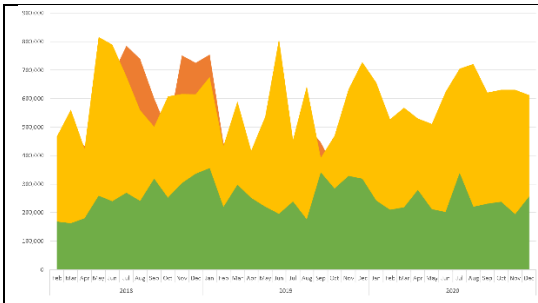


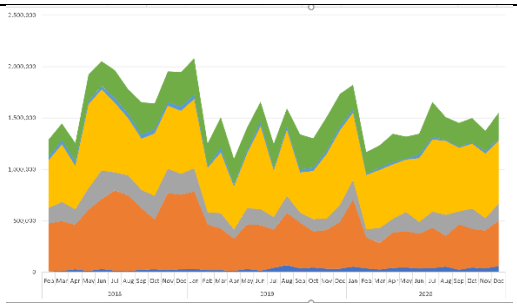
You can select which particular product category to project a trend line on if you wish.



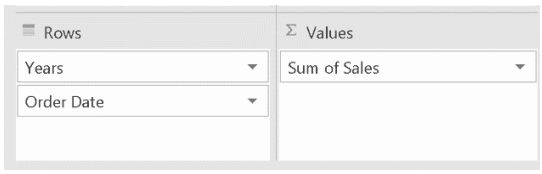


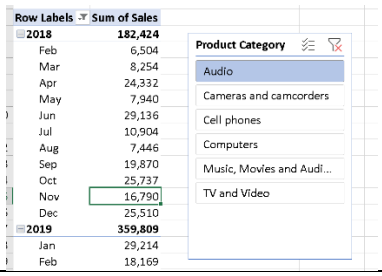
We can also change this to either an area graph and stacked area graph to get a better view of the contributions of each product category trending over time.



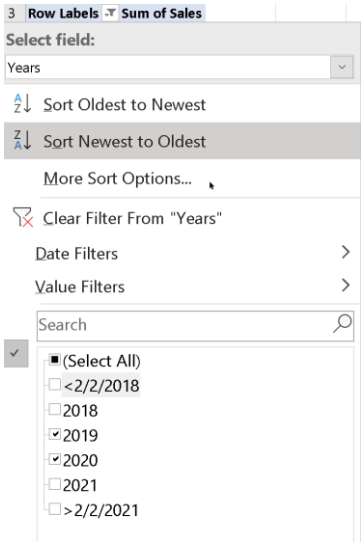


You could also take your Product Category out of the Columns and utilize it as a slicer instead, which then allows you to view the trends for each of these categories across the different chart types.



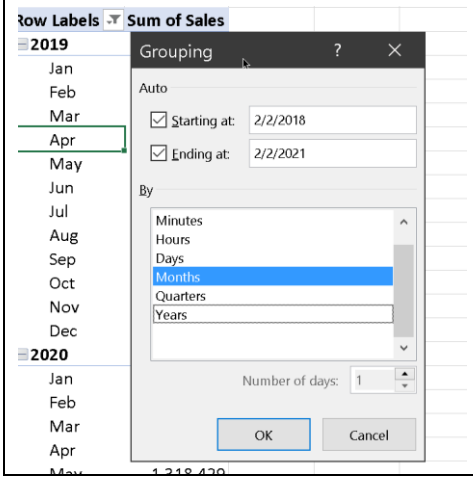


The next thing we will look is a seasonality graph, which we can create from another copy of the pivot table on a new worksheet. For seasonality, we typically want to take into account the years which have data for all the months, and filter out those that do not.



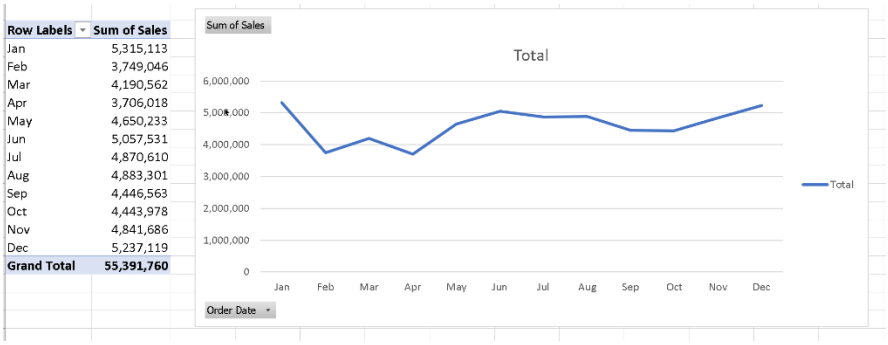
Row Labels	Sum of Sales
2019	**17,741,637**
Jan	2,081,908
Feb	1,252,298
Mar	1,507,751
Apr	1,103,451
May	1,408,131
Jun	1,657,980
Jul	1,248,653
Aug	1,593,694
Sep	1,340,433
Oct	1,300,579
Nov	1,511,809
Dec	1,734,950
2020	**17,284,124**
Jan	1,824,856
Feb	1,168,697
Mar	1,234,561
Apr	1,345,859
May	1,318,429
Jun	1,347,578
Jul	1,656,039
Aug	1,507,838
Sep	1,452,020
Oct	1,499,587
Nov	1,374,350
Dec	1,554,311
Grand Total	**35,025,760**

Next change custom grouping to Month. This will combine data from all the years concerned (2019, 2020).



Row Labels	Sum of Sales
Jan	5,315,113
Feb	3,749,046
Mar	4,190,561
Apr	3,706,018
May	4,650,233
Jun	5,057,531
Jul	4,870,610
Aug	4,883,301
Sep	4,446,563
Oct	4,443,978
Nov	4,841,686
Dec	5,237,119
Grand Total	**55,391,760**

Then we can generate a line graph to demonstrate the Seasonality.



Seasonality is really useful to understand so that we can understand where resource / sales demand peaks in specific periods of a year and therefore can significantly help with resource allocation planning. Its important to make sure you have a complete set of data for the entire time duration you are interested to perform analysis on (for e.g. all the months of a year, rather than partial months) because that will skew the visualization of the graph.

3.1 Practical exercise for Trend Analysis

Analytical activities to perform:

a) Create a line graph displaying the Profit by Year and Quarter

b) Add a polynomial trend line to the line graph

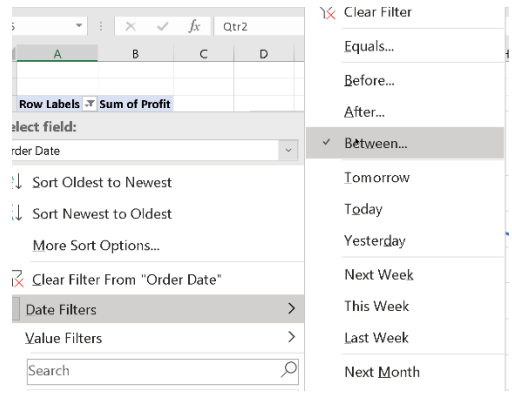
c) Add a Slicer for Product Category

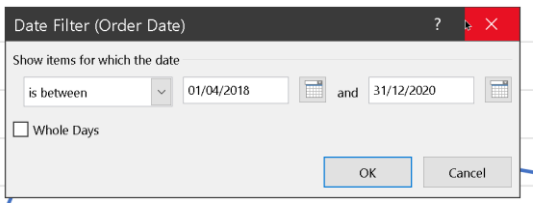
d) Create an area graph displaying the Profit by Year and Quarter for the Product Category

e) Add a Slicer for Country

File to use: File to use: `SalesData-v5.xlsx`

For first solution a), we can specifically target the quarters which are outliers in the dataset (suggesting that the data might be incomplete) and remove them using a Date filter with a Between.





Row Labels	Sum of Profit
2018	10,266,628
Qtr2	3,352,068
Qtr3	3,431,388
Qtr4	3,483,171
2019	11,378,957
Qtr1	3,172,056
Qtr2	2,541,105
Qtr3	2,731,591
Qtr4	2,934,205
2020	11,237,878
Qtr1	2,705,240
Qtr2	2,588,481
Qtr3	3,037,253
Qtr4	2,906,905
Grand Total	32,883,463

4 Ranking Analysis

Ranking analysis is about understanding the order of your items. Typically you would like the item with the highest value to be ranked number one and the item with the lowest value to have the lowest rank. So the easiest way to actually do a ranking is to sort your items.

Alternative forms of ranking including taking a selected number of items at the top and bottom of a sorted list. So you may want to see only say, the top ten items or the bottom 20 items.

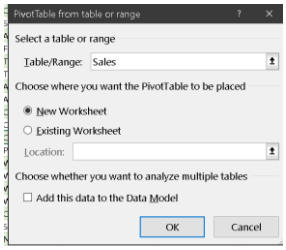
There are different ways to compute rankings and use them to affect the chronological order of how data is normally displayed (for e.g. months of a year).

Analytical activities to be performed:

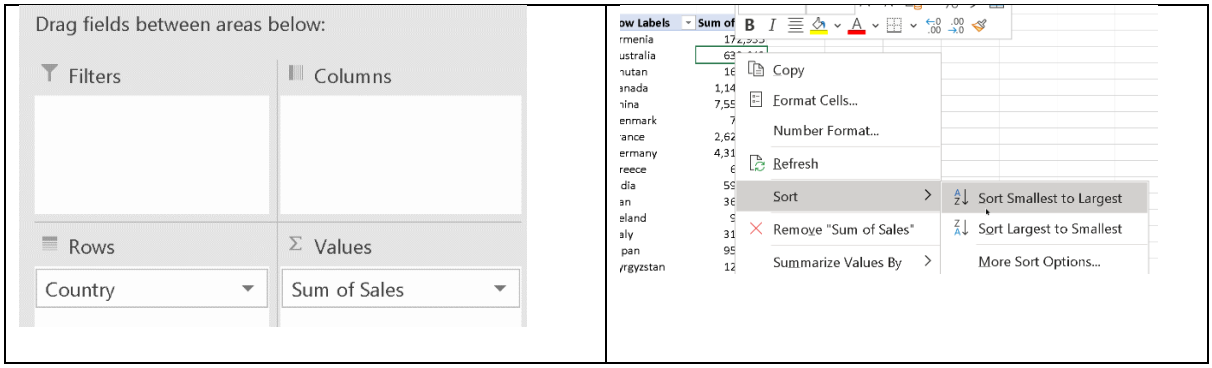
a) Display top 15 countries by sales
b) Display the top five product subcategories by sales
c) Display the products that contribute the top 20% of profit
d) Display the rankings of the profit by year and month - review by Product Category
e) Display the rankings for sales and profit by different countries

File to use: `SalesData-v6.xlsx`

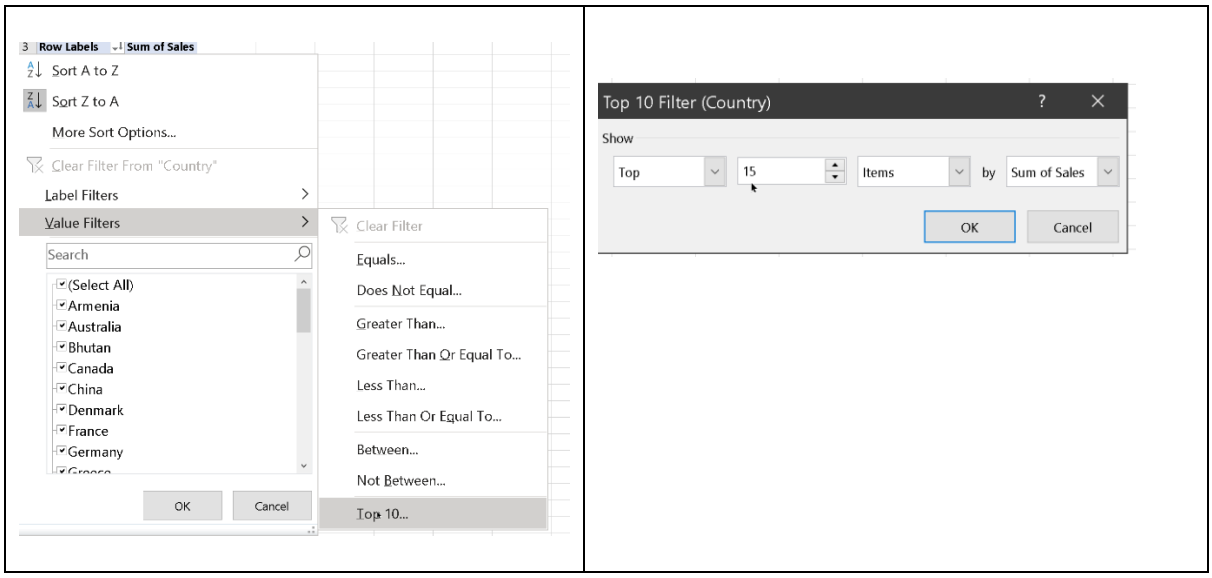
Start off again by generating a Pivot Table in the usual manner that references the Sales table.



The easiest way to do a ranking is to perform a Sort on the field of interest (Sum of Sales for e.g.)



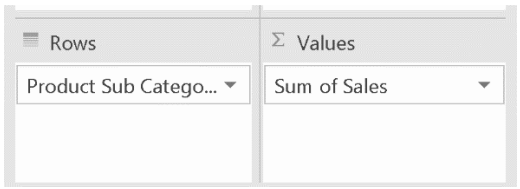
The Value Filters for a given Row Label field provides common options such as getting the top / bottom X items (rather than the entire list)

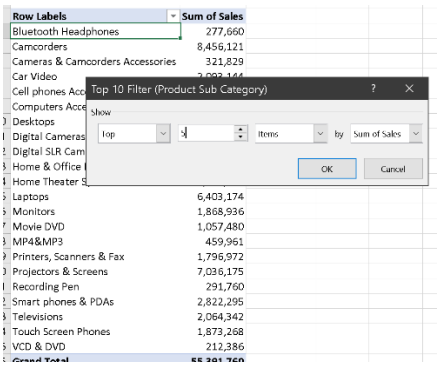


Row Labels	Sum of Sales
United States	31,635,241
China	7,557,974
Germany	4,314,956
France	2,628,401
United Kingdom	1,324,267
Canada	1,148,316
Japan	958,334
Australia	632,643
India	598,405
Russia	434,240
Turkmenistan	412,370
Iran	367,953
Syria	329,671
Italy	316,881
Pakistan	296,571
Grand Total	**52,956,223**

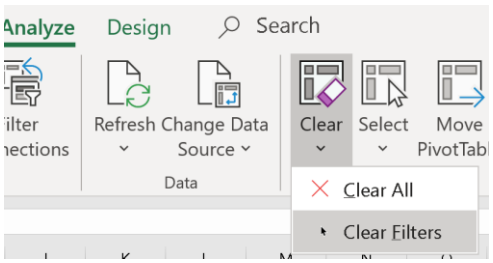
You can also further view rankings by Product Category (or any other suitable field) by adding an appropriate slicer for that particular field.

For the next analysis, we can repeat the use of the Value Filters for a given Row Label field to get the top 5. We can also add in another slicer for a suitable Field if we wish to.



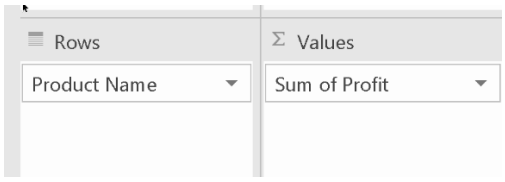


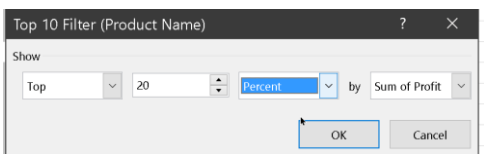
Note that you can clear the filters you have applied to the row / column labels in your Pivot table, and this is a good practice if you are going to apply multiple filters successfully.



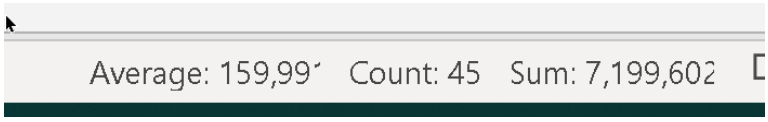
Row Labels	Sum of Sales
Bluetooth Headphones	277,660
Camcorders	8,456,121
Cameras & Camcorders Accessories	321,829
Car Video	2,093,144
Cell phones Accessories	825,948
Computers Accessories	709,927
Desktops	3,491,787
Digital Cameras	2,539,792
Digital SLR Cameras	5,731,190
Home & Office Phones	319,645
Home Theater System	4,737,968
Laptops	6,403,174
Monitors	1,868,936
Movie DVD	1,057,480
MP4&MP3	459,961
Printers, Scanners & Fax	1,796,972
Projectors & Screens	7,036,175
Recording Pen	291,760
Smart phones & PDAs	2,822,295
Televisions	2,064,342
Touch Screen Phones	1,873,268
VCD & DVD	212,386
Grand Total	**55,391,760**

For the next analysis, we are going to filter on the top 20% instead.



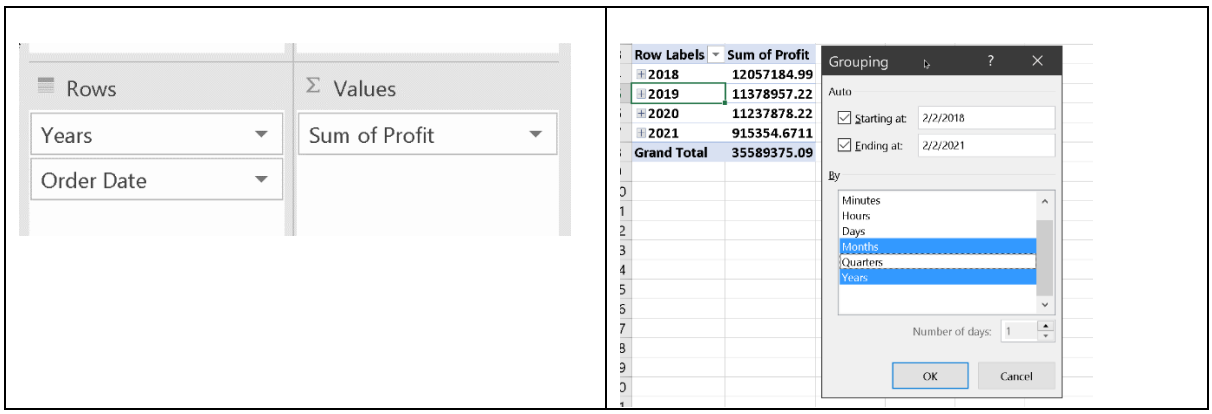


By highlighting all the values in the column for Sum of Profit, we can determine that 45 products contribute the top 20% of the profit, which is a form of Pareto Analysis.

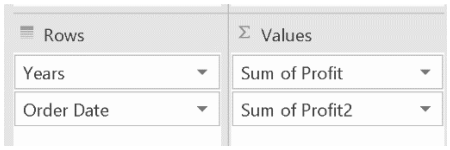


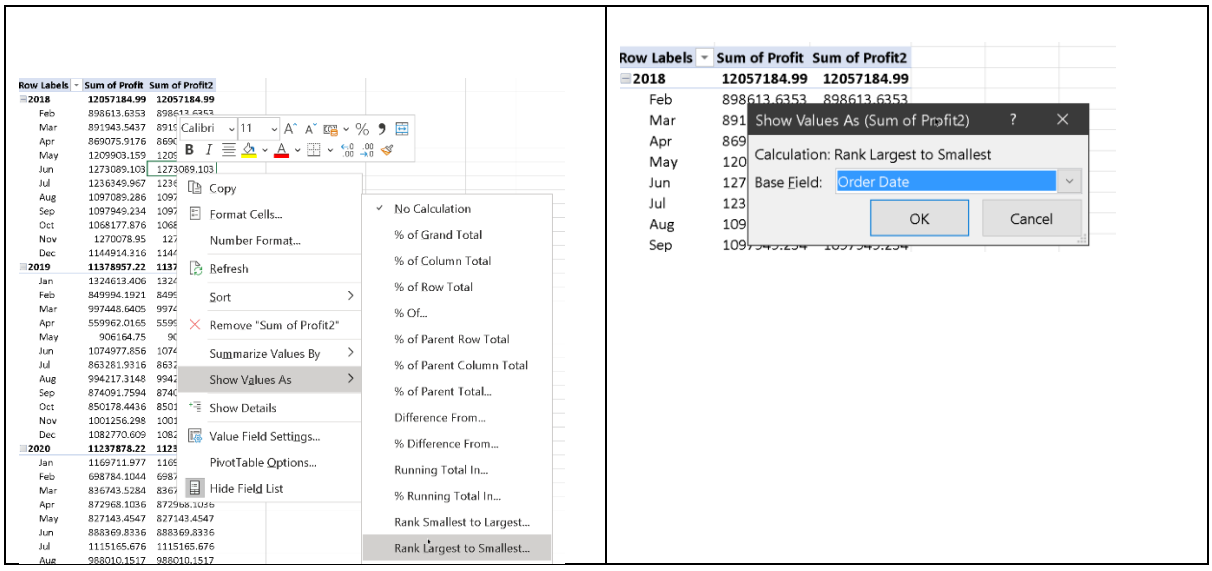
If we were to reverse this instead to find the bottom 20% of the list (in terms of overall profit), we would get slightly over 1000 products in that sub-list.
The idea would be that we would focus marketing efforts on the 45 products that contribute the top 20% of the profit, rather than all the other 1000 products

For the next analysis, we are interested in the rankings of the profit by year and month, so we need to perform the appropriate custom grouping.



To sort the months in terms of their profit total (rather than natural chronological order), we use a technique of adding in an extra sum of profit column, and performing a ranking on that instead.

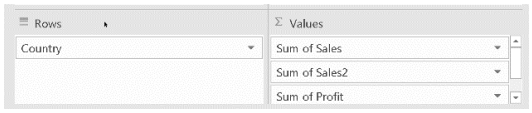




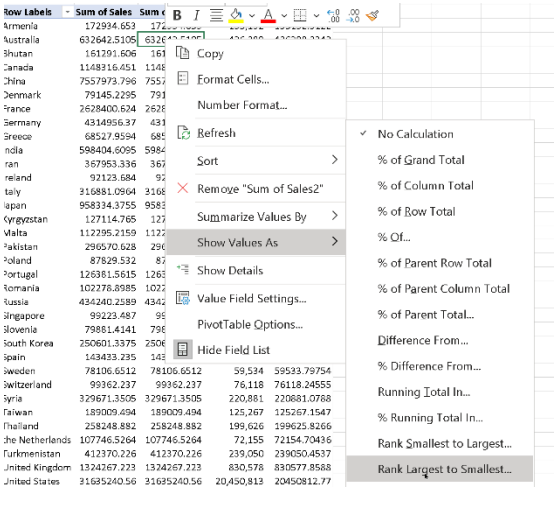
Now the months are shown in correct chronological order, but we also are able to see their ranking as well (in terms of which months had the highest sales)

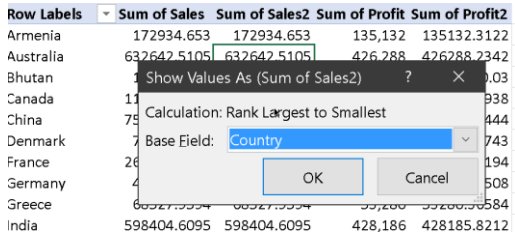
Row Labels	Sum of Profit	Sum of Profit2
2018	**12057184.99**	
Feb	898613.6353	9
Mar	891943.5437	10
Apr	869075.9176	11
May	1209903.159	4
Jun	1273089.103	1
Jul	1236349.967	3
Aug	1097089.286	7
Sep	1097949.234	6
Oct	1068177.876	8
Nov	1270078.95	2
Dec	1144914.316	5
2019	**11378957.22**	

The final analysis looks at the rankings for sales and profit by different countries. We can use the same technique that we did previously.



Row Labels	Sum of Sales	Sum of Sales2	Sum of Profit	Sum of Profit2
Armenia	172934.653	172934.653	135,132	135132.3122
Australia	632642.5105	632642.5105	426,288	426288.2342
Bhutan	161291.606	161291.606	116,520	116520.03
Canada	1148316.451	1148316.451	694,190	694190.0938
China	7557973.796	7557973.796	4,955,106	4955106.444
Denmark	79145.2295	79145.2295	54,735	54734.73743
France	2628400.624	2628400.624	1,500,337	1500337.194
Germany	4314956.37	4314956.37	2,672,333	2672332.508
Greece	68527.9594	68527.9594	53,280	53280.36584
India	598404.6095	598404.6095	428,186	428185.8212





We can repeat this again for the sum of Profit to get rankings for both Sales and Profit, which allows use to comparatively compare across these 2 categories. This may be useful for us to identify

anomalies where the sales ranking might be very high but the profit ranking is much lower or vice versa.

Row Labels	Total Sales	Sales Ranking	Total Profit	Profit Ranking
Armenia	172934.653	19	135,132	18
Australia	632642.5105	8	426,288	9
Bhutan	161291.606	20	116,520	20
Canada	1148316.451	6	694,190	6
China	7557973.796	2	4,955,106	2
Denmark	79145.2295	32	54,735	33
France	2628400.624	4	1,500,337	4
Germany	4314956.37	3	2,672,333	3
Greece	68527.9594	34	53,280	34
India	598404.6095	9	428,186	8
Iran	367953.336	12	193,023	16

4.1 Practical Exercise for Ranking Analysis

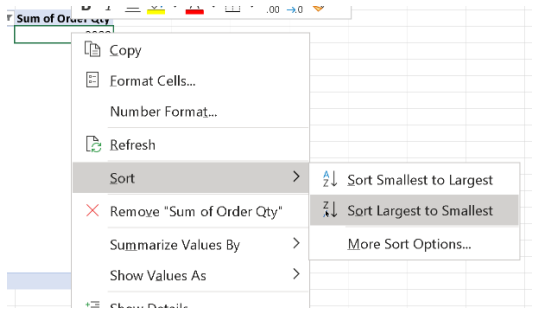
Analytical activities to perform:

a) Identify the Top 15 Products by Order Quantity sold, display the total Sales and Profit and add a Slicer for Country

b) Create a Ranking for Product Name based on Total Sales and Profit, showing the ranking for both Sales and Profit separately in 2 columns

File to use: `SalesData-v7.xlsx`

For a), note that after the initial filter for top 15, you can further perform a sort to get the sorted according to sum of order quantity, since the default sorting order is the values in the row label (which are alphabetical values)



Row Labels	Sum of Order Qty
Contoso In-Line Coupler E180 Silver	6780
Headphone Adapter for Contoso Phone E130 Silver	4680
Contoso Rubberized Snap-On Cover Hard Case Cell Phone Protector E160 Silver	4580
Contoso In-Line Coupler E180 White	4060
Contoso Rubberized Skin BlackBerry E100 Silver	3560
Cigarette Lighter Adapter for Contoso Phones E110 White	3520
Contoso Rubberized Snap-On Cover Hard Case Cell Phone Protector E160 Pink	3280
Contoso Touch Stylus Pen E150 Black	3060
Cigarette Lighter Adapter for Contoso Phones E110 Red	2900
Contoso Original K1m Li-Ion Standard Battery E170 Black	2860
Contoso In-Line Coupler E180 Black	2720
Contoso Rubberized Snap-On Cover Hard Case Cell Phone Protector E160 White	2700
Contoso Touch Stylus Pen E150 Red	2600
Contoso Rubberized Skin BlackBerry E100 Black	2560
Contoso Original K1m Li-Ion Standard Battery E170 Silver	2480
Grand Total	**52340**

For b) , you can also sort again on the separate ranking columns if you wish for Ranking on Sales and Ranking on Profit. This allows you to see correlation between ranking on sales and profit for various items.