Last Excel Lecture

Lecture 3

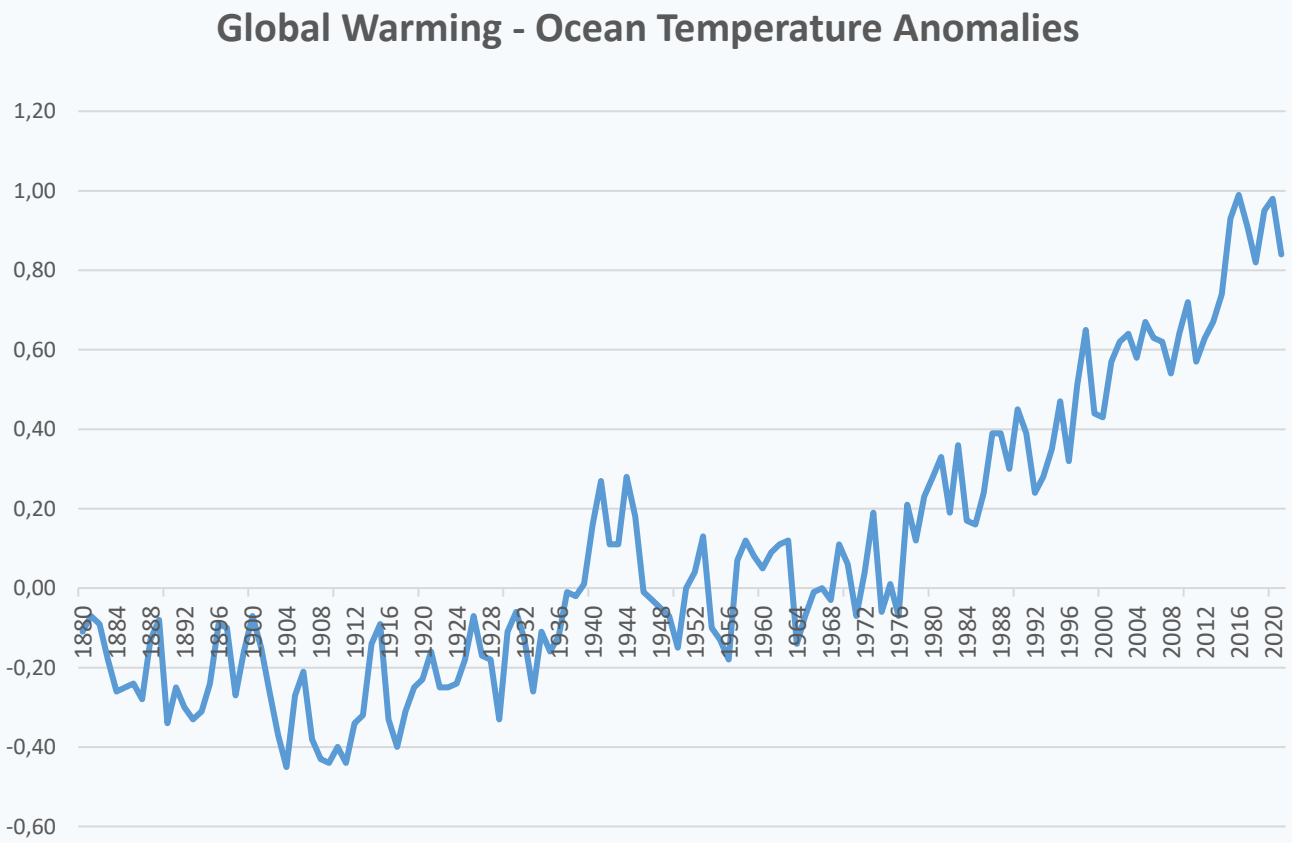
Lutz Pluemer

Charts

Last Chart from last Week

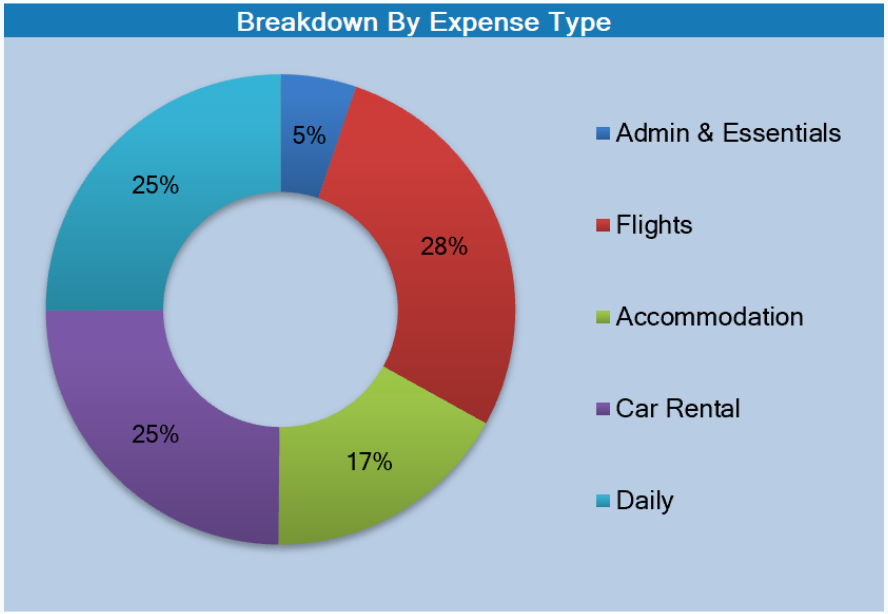
Global Warming - Let the Data speak for themselves

Temperature anomalies represent the difference from an average or baseline temperature. Negative means colder, Positive means warmer.

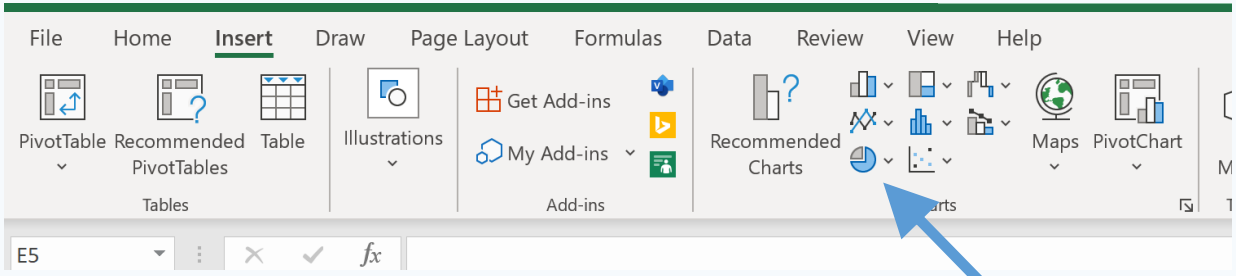


Pie Charts

- Chris Travel Budget already gave us a nice Pie Cart
- Use a pie chart when you need to show **composition** or **part** to **whole** data. It is best used to show percentages
- Percentages should sum up to **100 %**. If not, Pie Charts are not appropriate



Procedure


File
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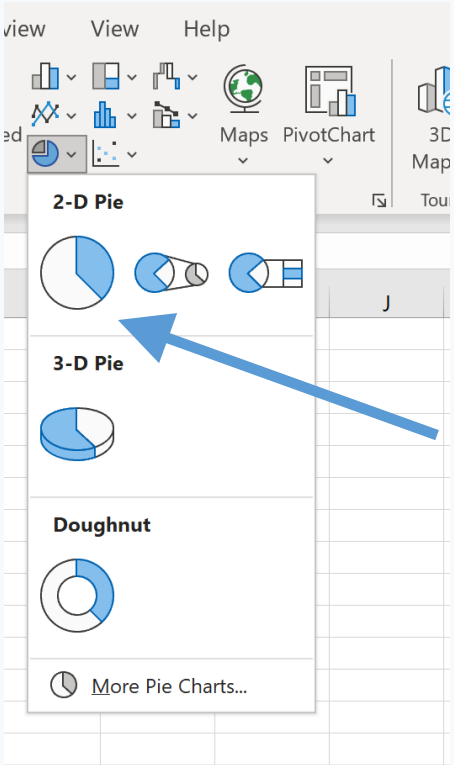
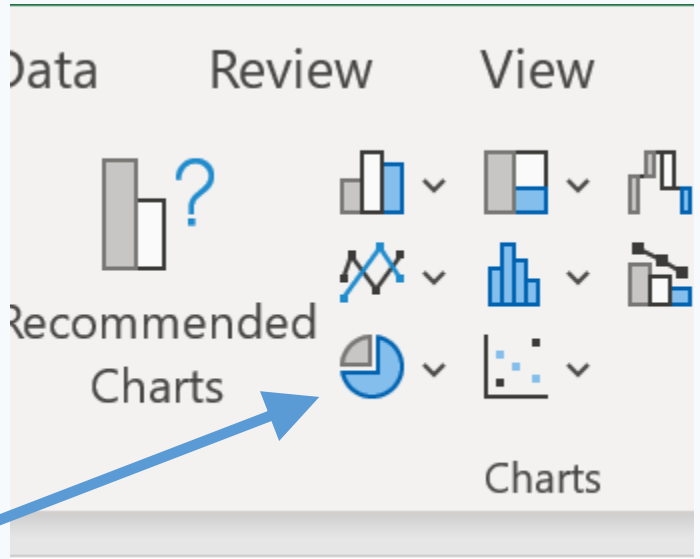
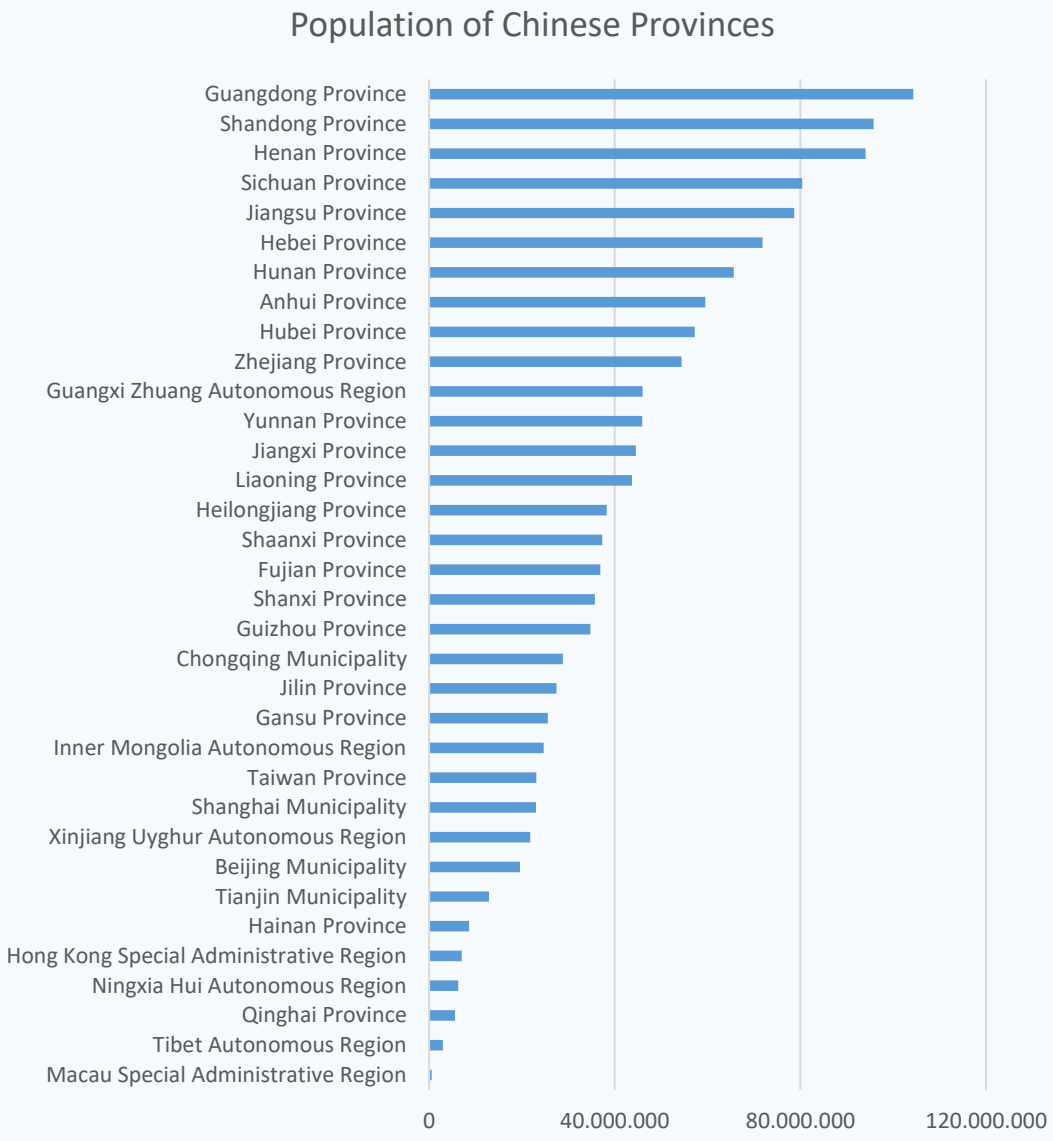
Recommended Charts
Maps
PivotChart
E5


View
Help
Maps
PivotChart
2-D Pie
3-D Pie
Doughnut
More Pie Charts...


Review
View
Recommended Charts
Charts

Clustered Bar Charts

- Pie Charts only make sense if you do not have (much) more than **8 parts**
- If you have **more**, or if your parts do **not sum up to 100%,** it is better to use **Clustered Bar** Charts



Data Review View Help

Recommended Charts

3D Map

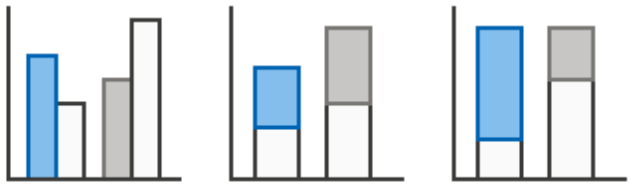
Tours

Line

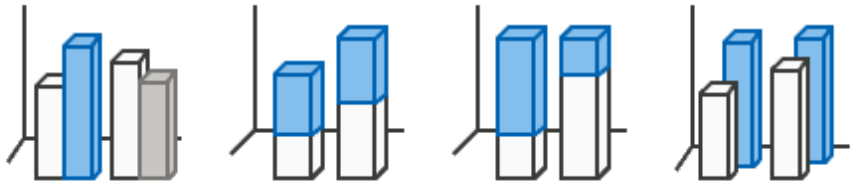
Colu

Sparkl

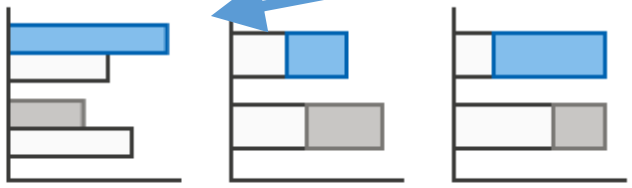
2-D Column



3-D Column



2-D Bar

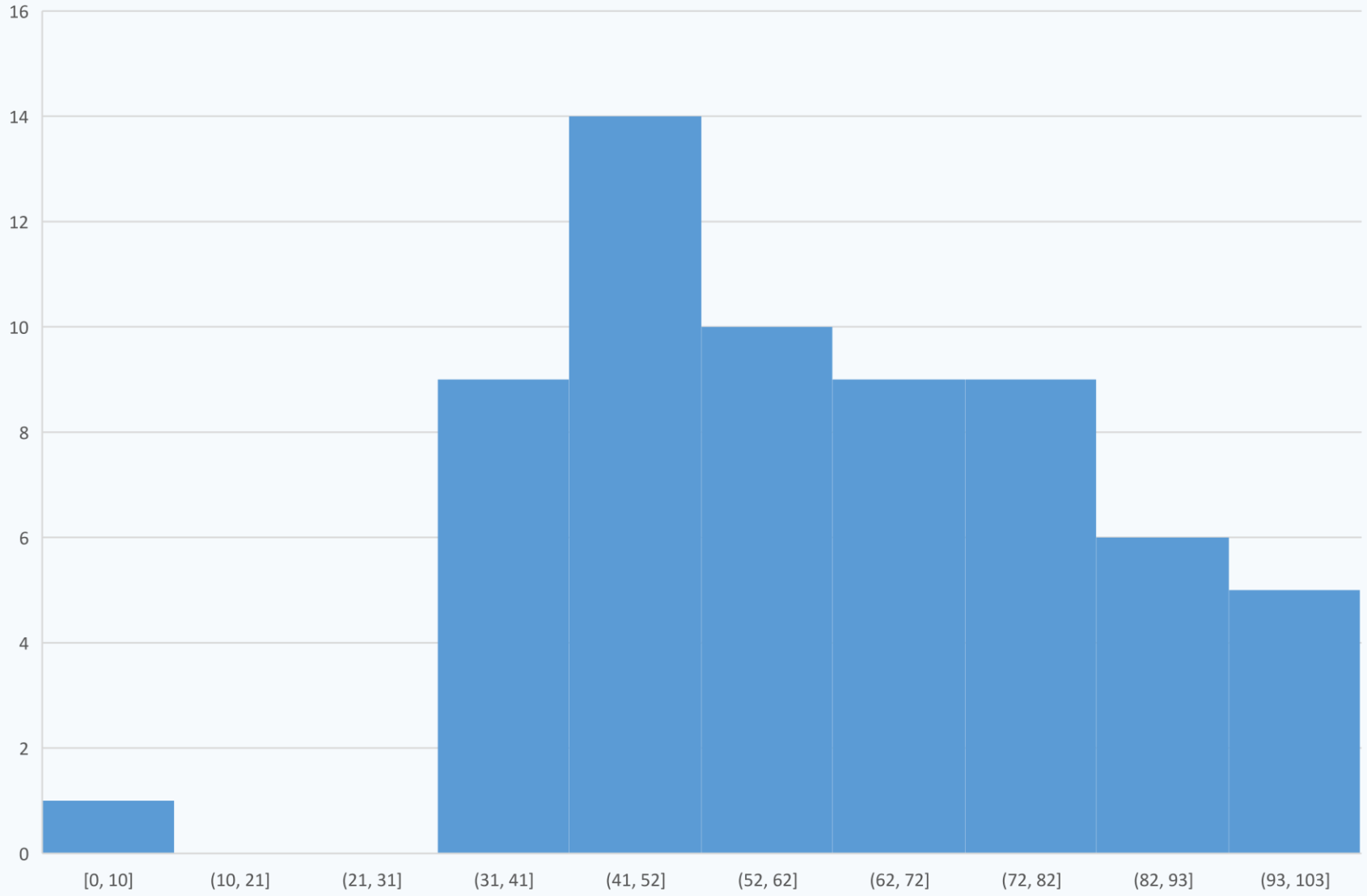


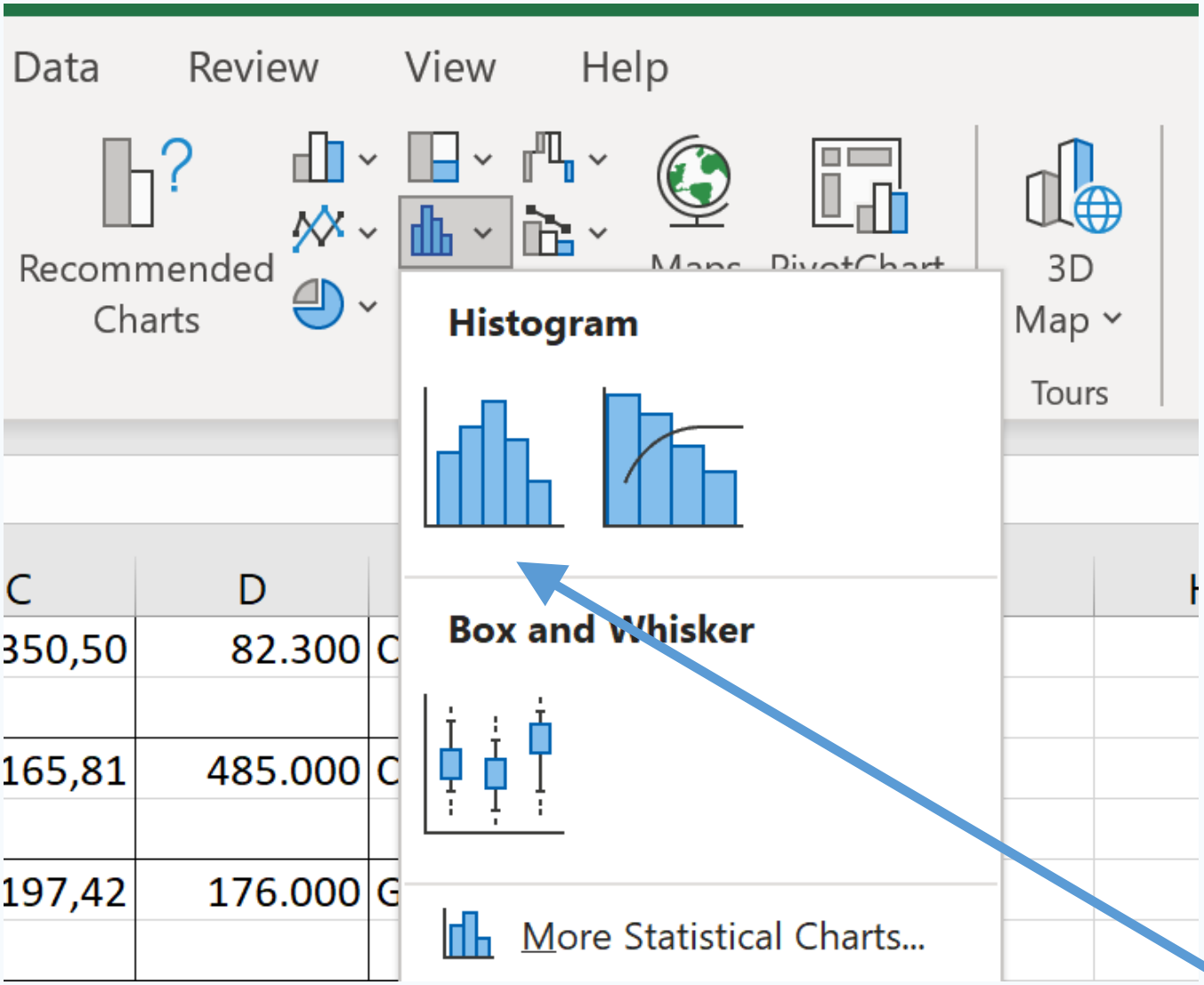
C	D	H
350,50	82	
165,81	485	
197,42	176	
116,66	394	

Histograms

- A histogram is a graphical representation of a frequency distribution of items with continuous or integral values such as population, temperature, …

Air Pollution in Chengdu 2018 - 2022 per Month Average




Data
Review
View
Help
Recommended Charts
Maps
PivotChart
3D Map
Tours
Histogram
Box and Whisker
More Statistical Charts...
C
D
350,50
82.300
165,81
485.000
197,42
176.000

Pivot Tables

- Pivot Tables are an **advanced** topic
- It is about **Data Analysis** by **grouping** and **aggregating** Attributes in huge Tables
- They summarize, analyze, explore, and present **summary** data.
- Using Pivot Tables allows to transform **rows** into **columns**. It allows **grouping** by any **categorical** field (column), and using advanced calculations on them.

Typical Example

Sales data

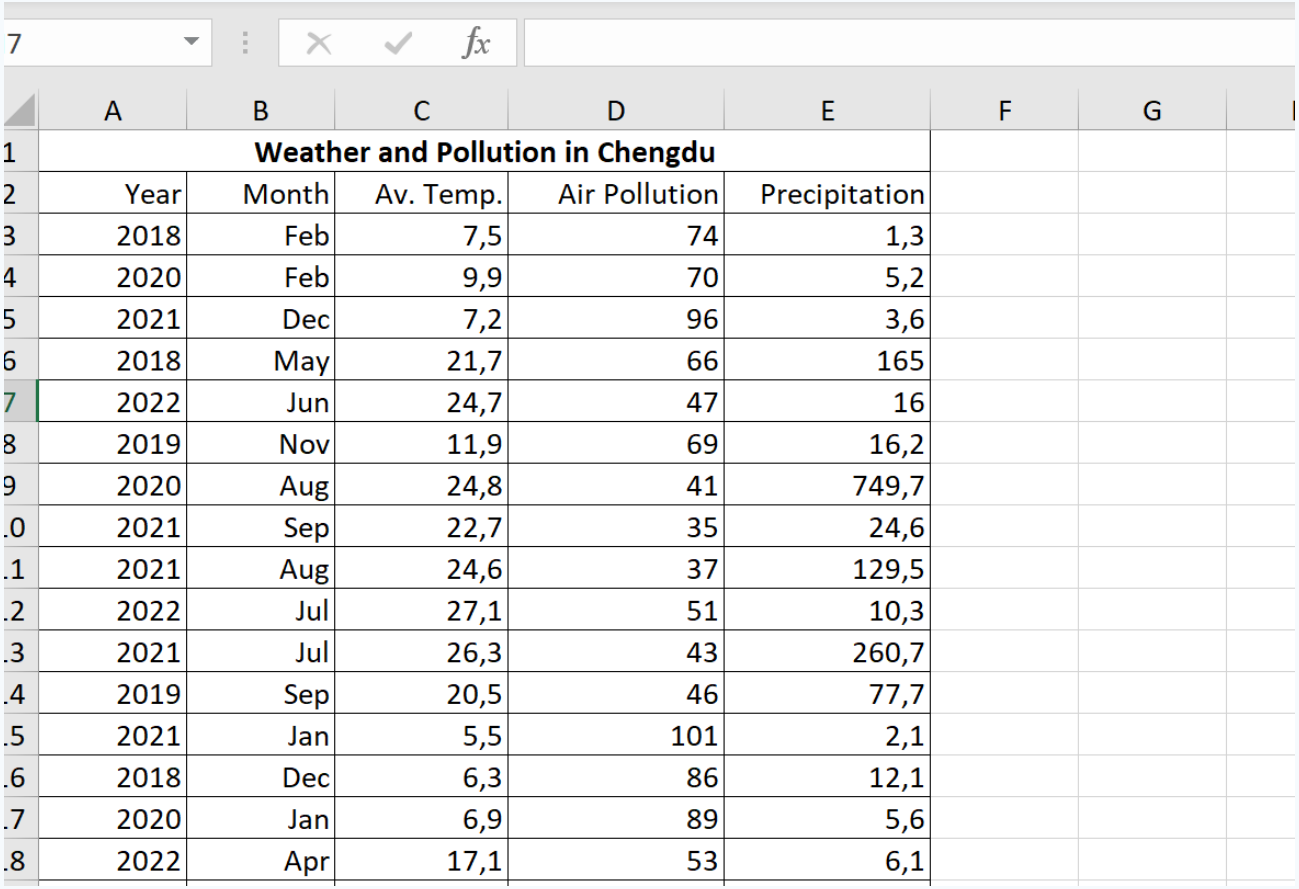
Year	Category	Product	Sales	Rating
2017	Components	Chains	$20,000	75%
2015	Clothing	Socks	$3,700	22%
2017	Clothing	Bib-Shorts	$4,000	22%
2015	Clothing	Shorts	$13,300	56%
2017	Clothing	Tights	$36,000	100%
2015	Components	Handlebars	$2,300	35%
2016	Clothing	Socks	$2,300	28%
2016	Components	Brakes	$3,100	36%
2016	Bikes	Mountain Bikes	$6,300	40%
2017	Components	Brakes	$5,100	38%
2016	Accessories	Helmets	$17,000	90%
2016	Accessories	Lights	$21,600	90%
2016	Accessories	Locks	$29,800	90%
2016	Components	Bottom Brackets	$1,000	23%
2015	Clothing	Jerseys	$6,700	5%
2017	Components	Bottom Brackets	$600	27%

Corresponding PivotTable

Row Labels	Sum of Sales
⊟ **Accessories**	**68400**
Helmets	17000
Lights	21600
Locks	29800
⊞ **Bikes**	**6300**
⊞ **Clothing**	**66000**
⊟ **Components**	**32100**
Bottom Brackets	1600
Brakes	8200
Chains	20000
Handlebars	2300
Grand Total	**172800**

Pivot Tables for Chengdu Climate

- This is what we have



	A	B	C	D	E	F	G
1	Weather and Pollution in Chengdu						
2	Year	Month	Av. Temp.	Air Pollution	Precipitation		
3	2018	Feb	7,5	74	1,3		
4	2020	Feb	9,9	70	5,2		
5	2021	Dec	7,2	96	3,6		
6	2018	May	21,7	66	165		
7	2022	Jun	24,7	47	16		
8	2019	Nov	11,9	69	16,2		
9	2020	Aug	24,8	41	749,7		
10	2021	Sep	22,7	35	24,6		
11	2021	Aug	24,6	37	129,5		
12	2022	Jul	27,1	51	10,3		
13	2021	Jul	26,3	43	260,7		
14	2019	Sep	20,5	46	77,7		
15	2021	Jan	5,5	101	2,1		
16	2018	Dec	6,3	86	12,1		
17	2020	Jan	6,9	89	5,6		
18	2022	Apr	17,1	53	6,1		

Pivot Tables for Chengdu Climate

- Something like this is what we like to have

Average monthly temperature in Chengdu fro

Year / *Month*	2013	2014	2015	2016	2017	2018
1	7,1	8,9	9,1	8,1	7,4	5
2	9,9	8,2	11,5	10,4	8,2	7,5
3	18,1	15,1	16,8	16,5	11,3	15,5
4	20,6	21,2	22,2	21,8	17,3	18,5
5	24,3	25,3	26,9	24,5	21,3	21,7
6	27,3	26,8	27,6	28,4	23,1	23,5
7	26,5	28,1	29,2	25,8	26,6	25,3
8	28,2	26,5	27,8	24,5	25,7	26,6
9	23,6	24,3	24	21,4	22,2	21,7
10	21,4	21,2	22	17,7	16,3	15,9
11	14,3	13,6	15,6	11,9	12,4	10,6
12	9,3	8,5	10	8,4	6,7	6,3

Pivot Tables for the Chengdu Weather Ex.

- This is what can be done by Pivot
- We look at the same Data from a different **Perspective**
- We turn "**Year**" date from **Row** to **Column**
- And above we **aggregate** by calculating the **Average**

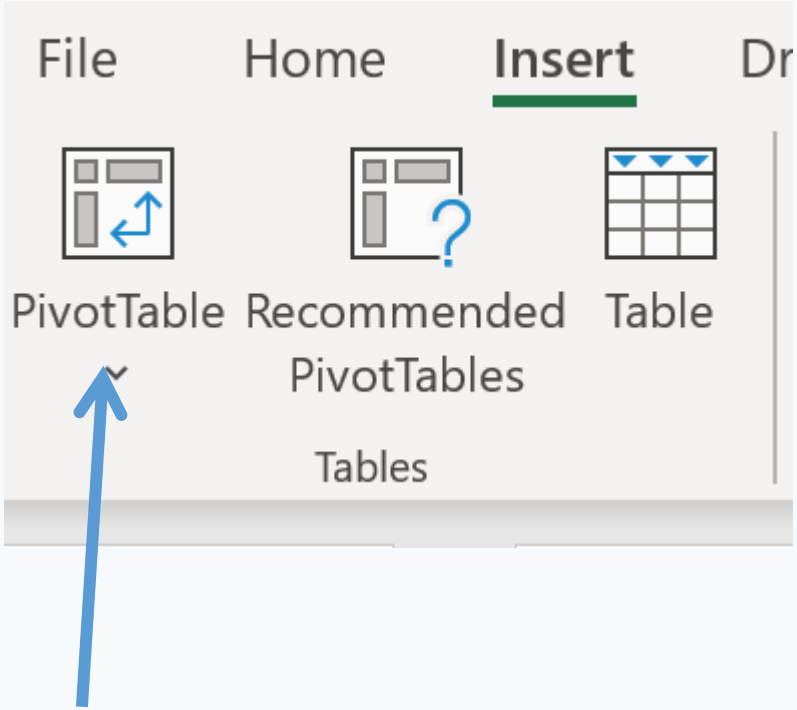
Years as Rows and Months as Columns

Sum of Av. Temp.	Column Labels											
Row Labels	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	5	7,5	15,5	18,5	21,7	23,5	25,3	26,6	21,7	15,9	10,6	6,3
2019	5,8	7,5	12,4	19,3	19,5	24	24,6	25	20,5	17,1	11,9	7,9
2020	6,9	9,9	13,7	15,9	22,3	24,7	24,9	24,8	21,2	15,9	12,9	5,5
2021	5,5	5,5	11,2	13,8	16	20,9	26,3	24,6	22,7	16	10,1	7,2
2022	6,7	6,2	15,8	17,1	19,8	24,7	27,1	28,2	20,5	16,8	14,1	6,2
2023	5,9	6,2										

Average Temperature per Month

Row Labels	Average of Av. Temp.
Jan	6,0
Feb	7,1
Mar	13,7
Apr	16,9
May	19,9
Jun	23,6
Jul	25,6
Aug	25,8
Sep	21,3
Oct	16,3
Nov	11,9
Dec	6,6

Procedure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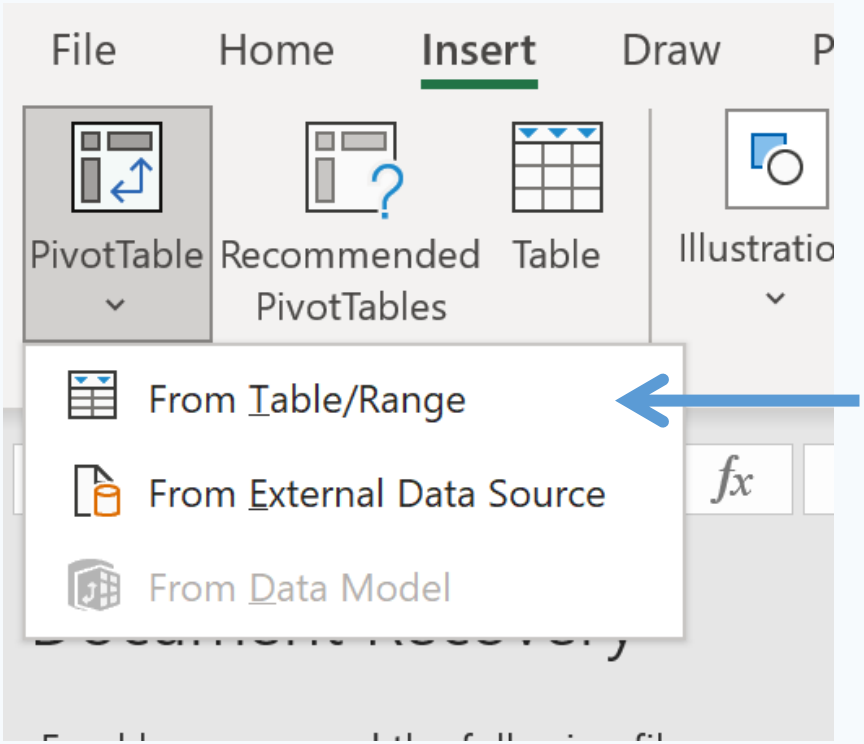
Recommended PivotTables
Table
Tables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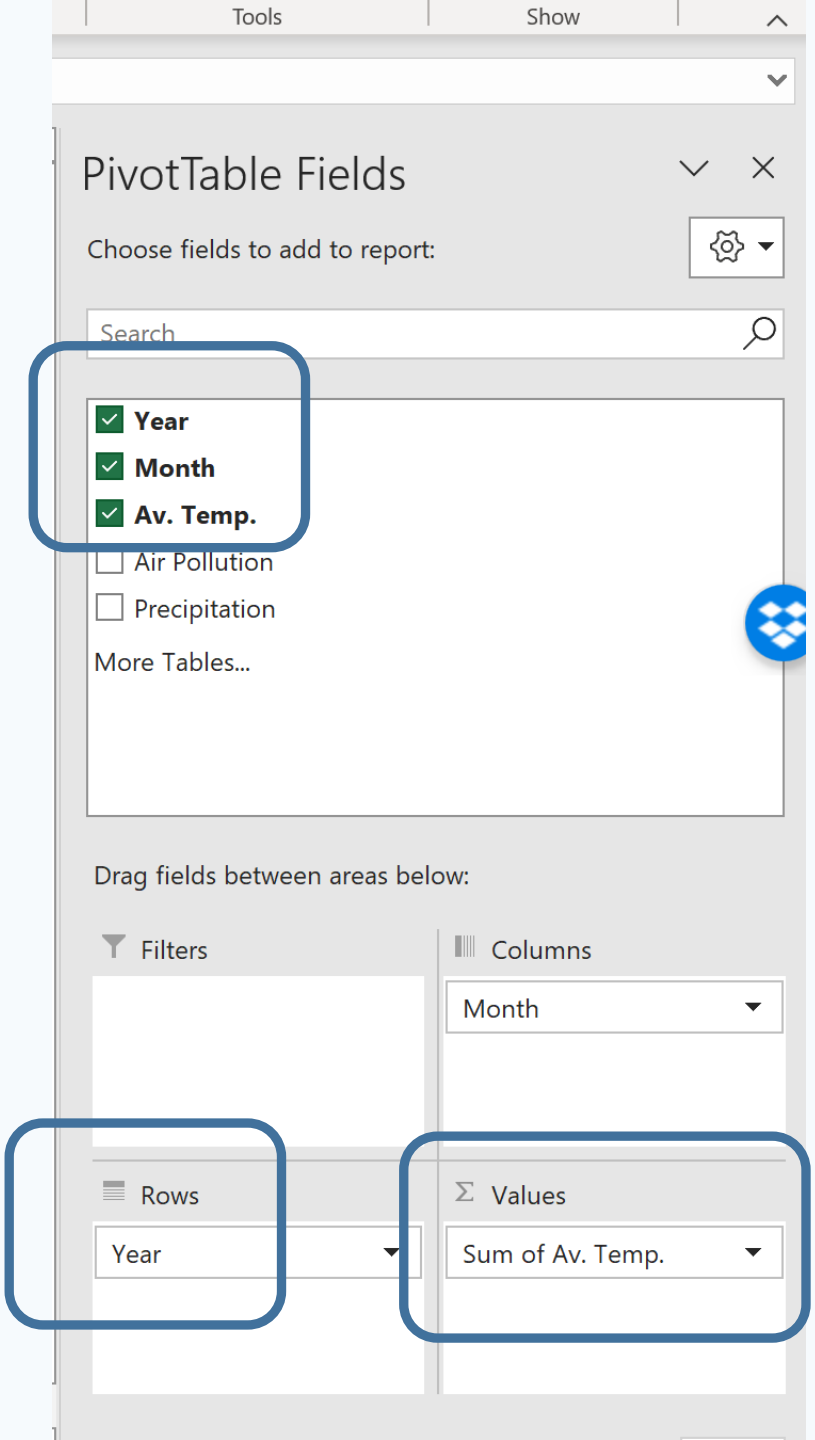
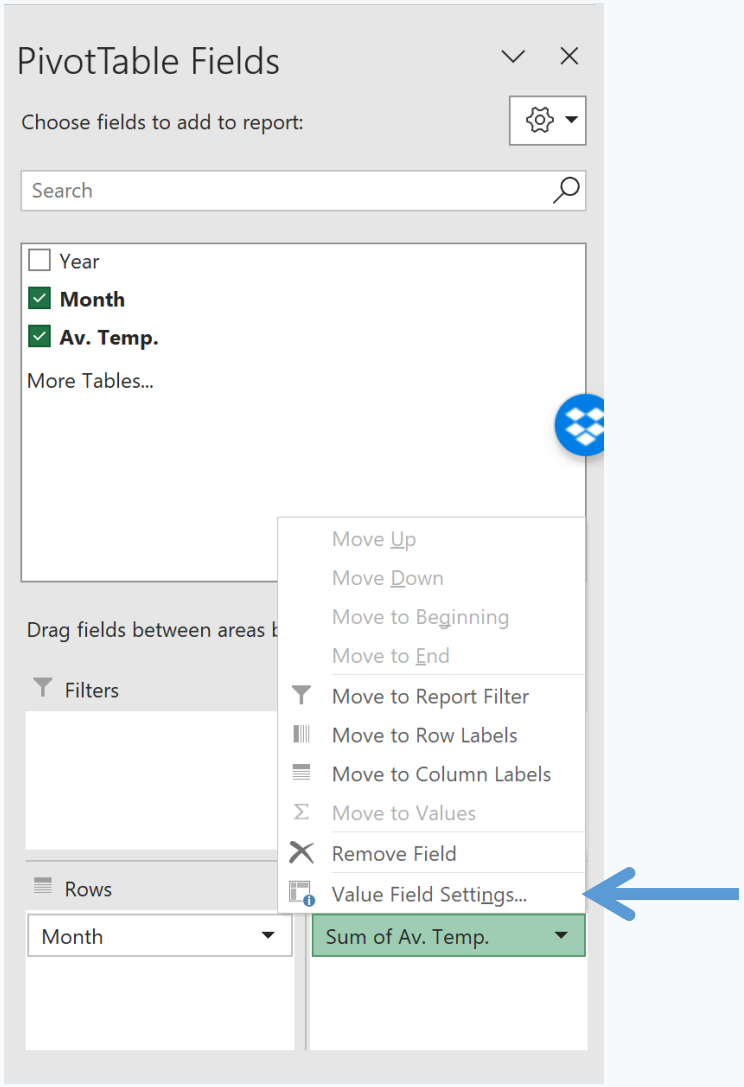
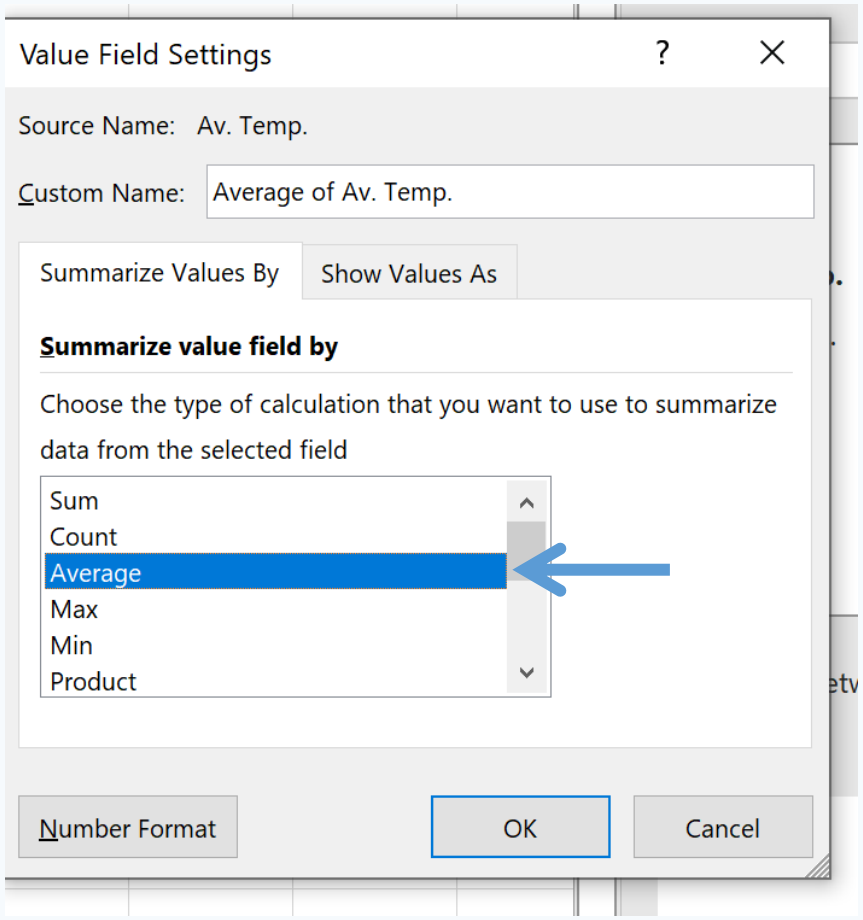
Procedure


Tools
Show
PivotTable Fields
Choose fields to add to report:
Search
Year
Month
Av. Temp.
Air Pollution
Precipitation
More Tables...
Drag fields between areas below:
Filters
Columns
Month
Rows
Year
Values
Sum of Av. Temp.

Get this

Sum of Av. Temp.	Column Labels											
Row Labels	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	5	7,5	15,5	18,5	21,7	23,5	25,3	26,6	21,7	15,9	10,6	6,3
2019	5,8	7,5	12,4	19,3	19,5	24	24,6	25	20,5	17,1	11,9	7,9
2020	6,9	9,9	13,7	15,9	22,3	24,7	24,9	24,8	21,2	15,9	12,9	5,5
2021	5,5	5,5	11,2	13,8	16	20,9	26,3	24,6	22,7	16	10,1	7,2
2022	6,7	6,2	15,8	17,1	19,8	24,7	27,1	28,2	20,5	16,8	14,1	6,2
2023	5,9	6,2										


PivotTable Fields
Choose fields to add to report:
Search
Year
Month
Av. Temp.
More Tables...
Drag fields between areas b
Filters
Rows
Month
Sum of Av. Temp.
Move Up
Move Down
Move to Beginning
Move to End
Move to Report Filter
Move to Row Labels
Move to Column Labels
Move to Values
Remove Field
Value Field Settings...


Value Field Settings
?
Source Name: Av. Temp.
Custom Name: Average of Av. Temp.
Summarize Values By
Show Values As
Summarize value field by
Choose the type of calculation that you want to use to summarize data from the selected field
Sum
Count
Average
Max
Min
Product
Number Format
OK
Cancel

Average Temperature per Month

Row Labels	Average of Av. Temp.
Jan	6,0
Feb	7,1
Mar	13,7
Apr	16,9
May	19,9
Jun	23,6
Jul	25,6
Aug	25,8
Sep	21,3
Oct	16,3
Nov	11,9
Dec	6,6

Classroom Exercise for Today

- Make a **Pie Chart** for the Travel **Budget Expense Types** using the file “travel budget Breakdown by Expense Type.xls”
- Make a **Clustered Bar Chart** for the **Area** of Chinese Provinces
- Make a **Histogram** for the **Temperature** in Chengdu 2018 - 2022
- Make **Pivot** Tables for the **Precipitation** and the **Average** Precipitation per Month as shown for Temperature above

- And before you **leave**:
- Open a **Jupyter notebook** on your Laptop and **show** it to your counselor
- Those who solved these problem already, can cancel them today.
- If you have **finished**, you can **leave** – after presenting your results to your counselor.
- Or already **start** your **homework** Exercises

Homework Exercises

- There are three more files on the server
- Average monthly **sunshine** hours in Germany
- Annual Global **Carbon Dioxide** Emissions since 1940
- Emissions from Energy by **Region**

- Please design different Charts for these different tables. This time it is **your task** to decide which kind of chart is most **appropriate**. There may be more than **one** chart (but not more than **five**) for each table.

- **Upload** the results of your group as a **zip-file** on the server not later than **Sunday night**.
  Use the prescribed **format** for **naming** the files.

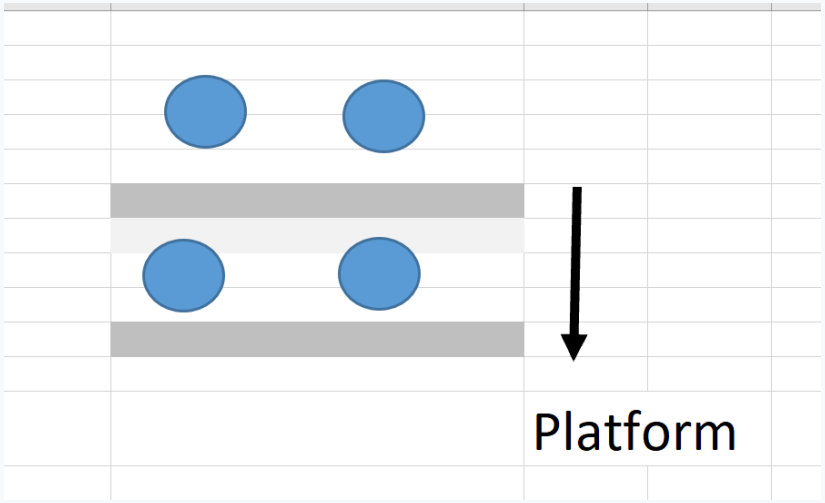
- Make sure that you are prepared to work with **Jupyter** on your Laptop in the next lecture.

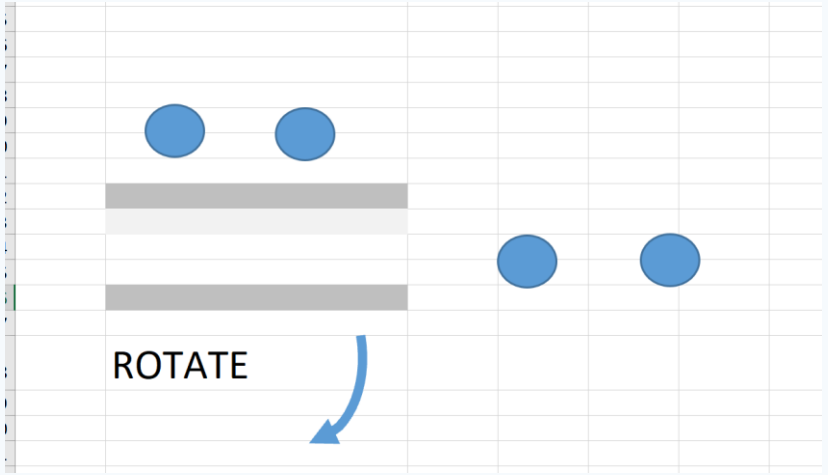
Grouping the Tables (this time more smoothly)

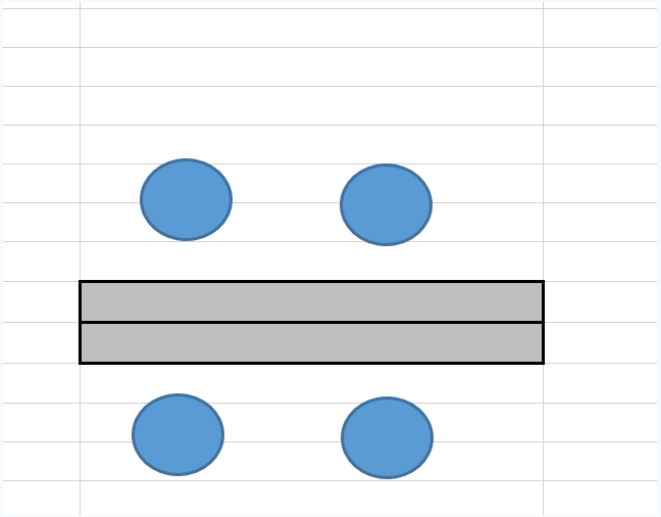
Platform					
Group 1	Group 6		Group 11		Group 12
Group 2	Group 7				Group 13
Group 3	Group 8				Group 14
Group 4	Group 9				Group 15
Group 5	Group 10				Group 16

Procedure

- Look for the advice of your group counselor
- Start with groups 5, 10 and 16
- Push the empty tables to the window wall to get space.
- Push the tables for your group in the direction of the window first, to get space for the others
- Rearrange the tables as described
- The other groups subsequently follow in the order from the window to the platform







take advantage of the space provided before