Table, Pivot and Graphs

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Contents

1. Purpose

- This lesson will focus on teaching you how to create Tables, Pivots, Graphs and how to work with its basic functions, Don't despair if you won't understand all from just reading the lesson. We highly recommend to test out the content by trying to use it as you progress through the lesson.
- The lesson should take approximately 1 hour to finish.

2. Definition

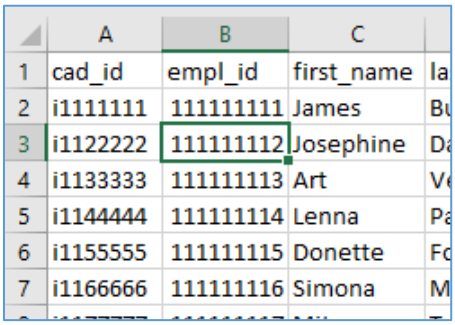
- **Range** – As you've seen in previous lesson ranges are selection of cells.
- **Excel Tables** – Table is form of range with pre-defined format. **Tables** allow you to analyze your data in **Excel** quickly and easily.
- **Pivot Tables** - **Pivot tables** are one of **Excel**'s most powerful features. A pivot table allows you to extract the significance from a large, detailed data set.
- **Graphs** – More correctly **Charts,** can say more than a sheet full of numbers. As you'll see, creating charts is very easy. More complex charts/graphs or related, dependent charts can be created but that will not be focus of this lesson.

3. Content

3.1. EXCEL TABLE

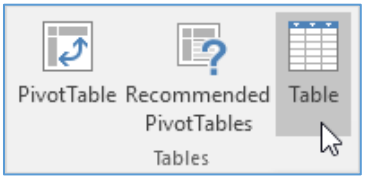
3.1.1. INSERT A TABLE

- Click any single cell inside the data set.

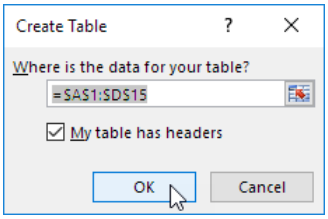


	A	B	C	
1	cad_id	empl_id	first_name	la
2	i1111111	111111111	James	Bu
3	i1122222	111111112	Josephine	Da
4	i1133333	111111113	Art	Ve
5	i1144444	111111114	Lenna	Pa
6	i1155555	111111115	Donette	Fo
7	i1166666	111111116	Simona	M

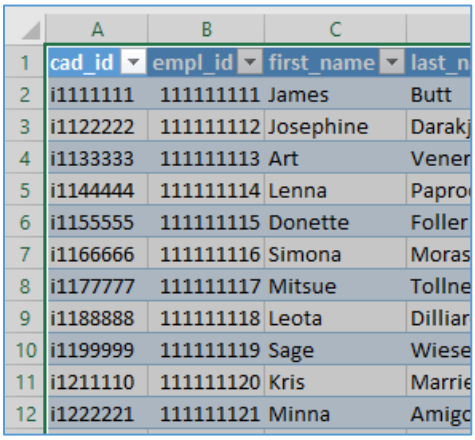
- On the Insert tab, in the Tables group, click Table.



- Excel automatically selects the data for you. Check 'My table has headers' and click on OK.

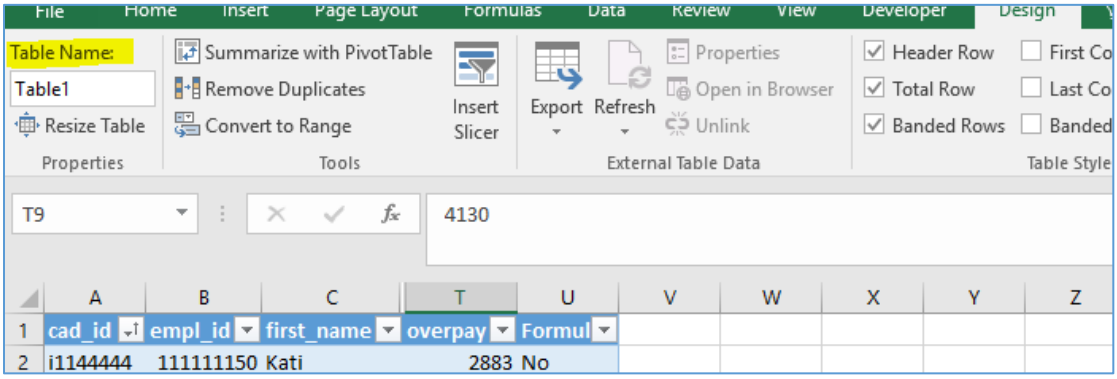


- Excel creates a nicely formatted table for you. This may still seem like a normal data range to you but many powerful features are now available.



	A	B	C	
1	cad_id	empl_id	first_name	last_n
2	i1111111	111111111	James	Butt
3	i1122222	111111112	Josephine	Darakj
4	i1133333	111111113	Art	Vener
5	i1144444	111111114	Lenna	Papro
6	i1155555	111111115	Donette	Foller
7	i1166666	111111116	Simona	Moras
8	i1177777	111111117	Mitsue	Tollne
9	i1188888	111111118	Leota	Dilliar
10	i1199999	111111119	Sage	Wiese
11	i1211110	111111120	Kris	Marrie
12	i1222221	111111121	Minna	Amigo

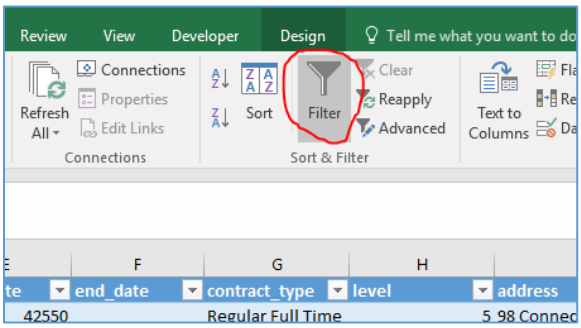
- Each table has its own name, same as all the objects in excel. The name can be changed, which is recommended, as it will make it much easier for you to work or refer to the table with relevant name.

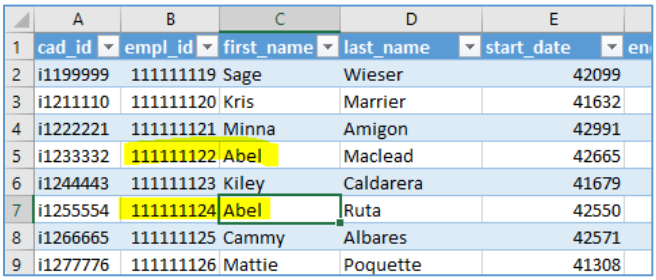


3.1.2. SORT A TABLE

To sort by multiple columns.

- Turn on filter if its not yet done.





	A	B	C	D	E
1	cad_id	empl_id	first_name	last_name	start_date
2	i1199999	111111119	Sage	Wieser	42099
3	i1211110	111111120	Kris	Marrier	41632
4	i1222221	111111121	Minna	Amigon	42991
5	i1233332	111111122	Abel	Maclead	42665
6	i1244443	111111123	Kiley	Caldarera	41679
7	i1255554	111111124	Abel	Ruta	42550
8	i1266665	111111125	Cammy	Albares	42571
9	i1277776	111111126	Mattie	Poquette	41308

- Click the arrow next to empl_id and click Sort Largest to Smallest
- Click the arrow next to first_name and click Sort A to Z

	A	B	C	D
1	cad_id	empl_id	first_name	last_name
2	i1255554	111111124	Abel	Ruta
3	i1233332	111111122	Abel	Maclead
4	i5244403	111111436	Adelina	Nabours
5	i6088839	111111559	Adell	Lipkin

3.1.3. Filter a Table

- Click the arrow next to first_name and only check Abel.

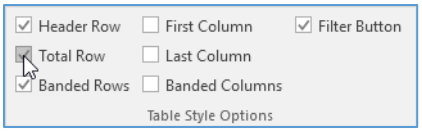
B	C	D
empl_id	first_name	last_name
111111124	Abel	Ruta
111111122	Abel	Maclead

Many different option for filter exist (word starting with, containing something, date, number larger than, etc.) Please try these options on your own.

- To filter the table, you can use Slicer as well, to which we will dedicate more time in pivots.

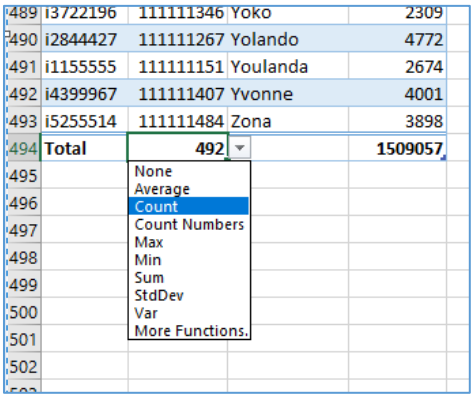
3.1.4. Total Row

- First, select a cell inside the table. Next, on the Design tab, in the Table Style Options group, check Total Row.



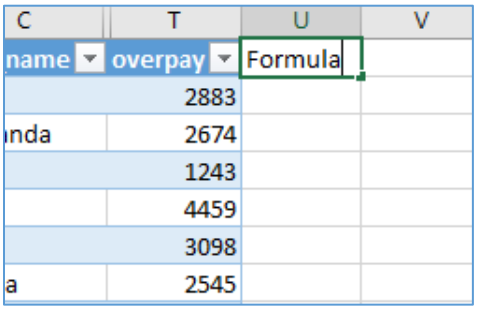
	A	B	C	T	U
488	i2455542	111111232	Xuan	1364	
489	i3722196	111111346	Yoko	2309	
490	i2844427	111111267	Yolando	4772	
491	i1155555	111111151	Youlanda	2674	
492	i4399967	111111407	Yvonne	4001	
493	i5255514	111111484	Zona	3898	
494	**Total**			**1509057**	
495					
496					

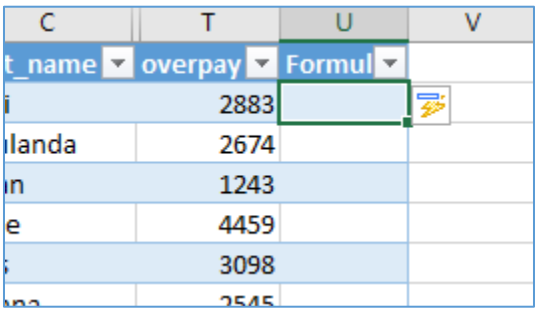
- Click any cell in the last row to calculate the Total (Average, Count, Max, Min, Sum etc.) of a column. For example, count number of records in Emp. ID column.



3.1.5. STRUCTURE

- To add additional column simply write title of the header and press enter

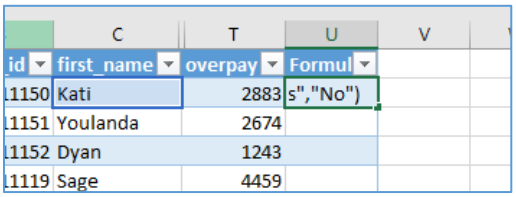


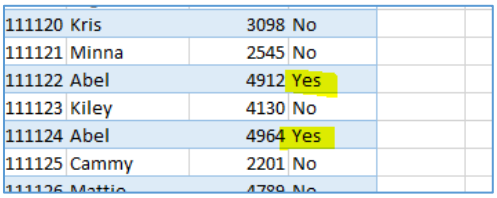


- Table has ability to auto populate formulas for whole column. Let's take a formula IF as an example. We want our IF formula to write Yes in a cell if first letter of specified cell is letter A and to write No if not. The structure (syntax) of this formula is following:

=IF(LEFT([@[first_name]],1)="A","Yes","No")

- Once you write in the formula, press enter and table will auto populate down. This function also continues to carry on even after adding new row.

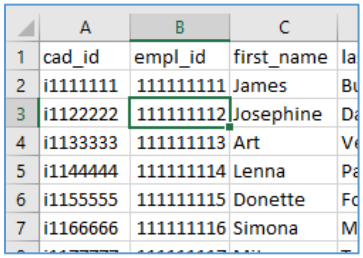




3.1.6. TABLE STYLES

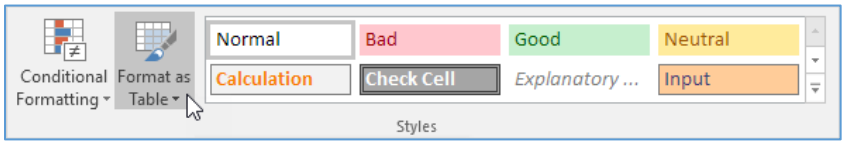
There are two ways of choosing suitable style of table.

- Create table from range with selected style
  - Click any single cell inside the range

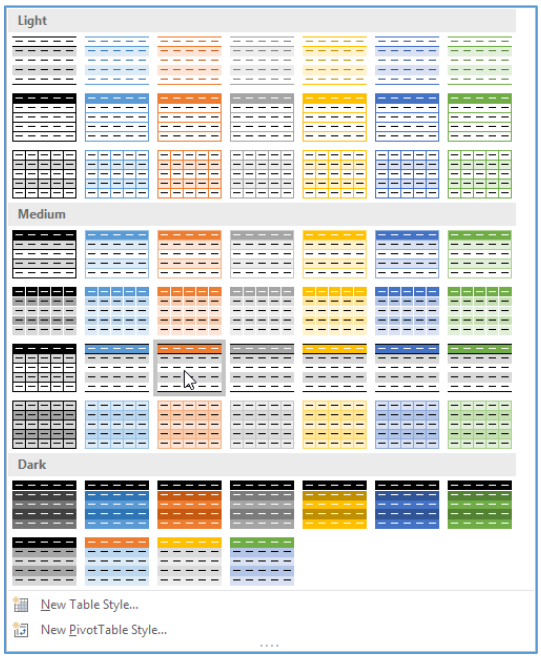


	A	B	C	
1	cad_id	empl_id	first_name	la
2	i1111111	111111111	James	Bu
3	i1122222	111111112	Josephine	Da
4	i1133333	111111113	Art	Ve
5	i1144444	111111114	Lenna	Pa
6	i1155555	111111115	Donette	Fo
7	i1166666	111111116	Simona	M

  - On the Home tab, in the Styles group, click Format as Table.

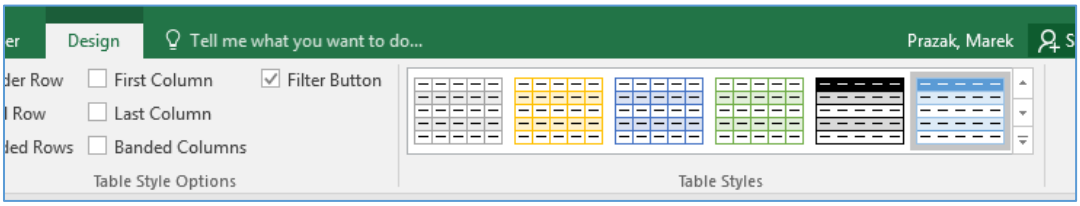


  - Choose a table style.



Note: *click **New Table Style** to **create your own table style** or right click a table style and click Duplicate to create a new table style that is similar to an existing one. Modifying a custom table style affects all tables in a workbook that use that table style. This can save a lot of time.*

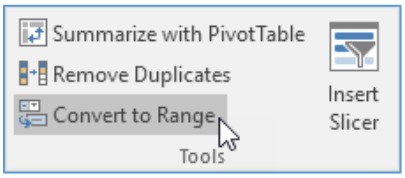
- Change style of table for existing table
  - In Design tab choose different style in Table Styles section



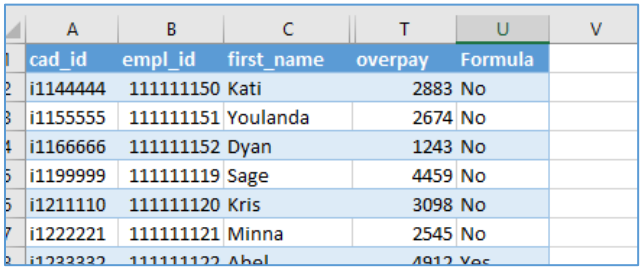
3.1.7. CONVERT TABLE TO RANGE

To convert this table back to a normal range of cells (and keep the formatting)

- Select a cell inside the table. Next, on the Design tab, in the Tools group, click Convert to Range.



- Result. A nicely formatted range of cells



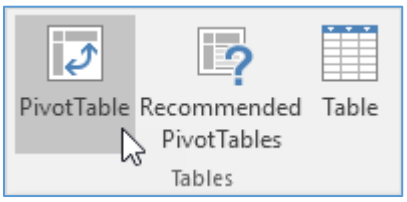
	A	B	C	T	U	V
1	cad_id	empl_id	first_name	overpay	Formula	
2	i1144444	111111150	Kati	2883	No	
3	i1155555	111111151	Youlanda	2674	No	
4	i1166666	111111152	Dyan	1243	No	
5	i1199999	111111119	Sage	4459	No	
6	i1211110	111111120	Kris	3098	No	
7	i1222221	111111121	Minna	2545	No	
8	i1233332	111111122	Abel	4912	Yes	

Note: *to remove the table style, select the range of cells, on the Home tab, in the Styles group, click Normal.*

3.2. *PIVOT TABLES*

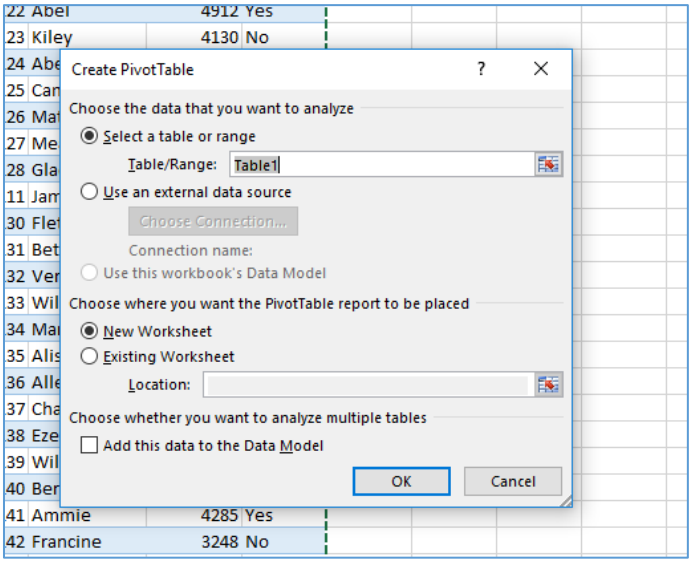
3.2.1. INSERT A PIVOT TABLE

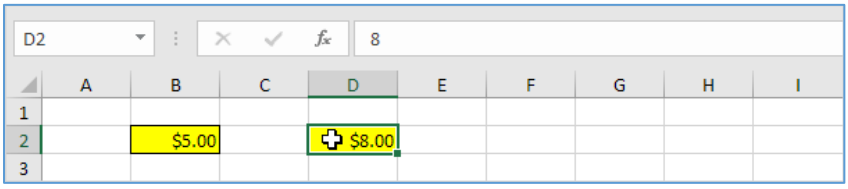
- Click any single cell inside the range or Table
  - Pivot Table created from range will be under normal conditions static, which means if you add new rows to your range it will not show up in the pivot
  - Pivot Table created from Table will be more dynamic, meaning if you add new rows and refresh pivot, it will contain all data from table
- For simplification, use previously created table
- On the Insert tab, in the Tables group, click PivotTable



The following dialog box appears. Excel automatically selects the data(Table) for you. The default location for a new pivot table is New Worksheet.

- Click OK.

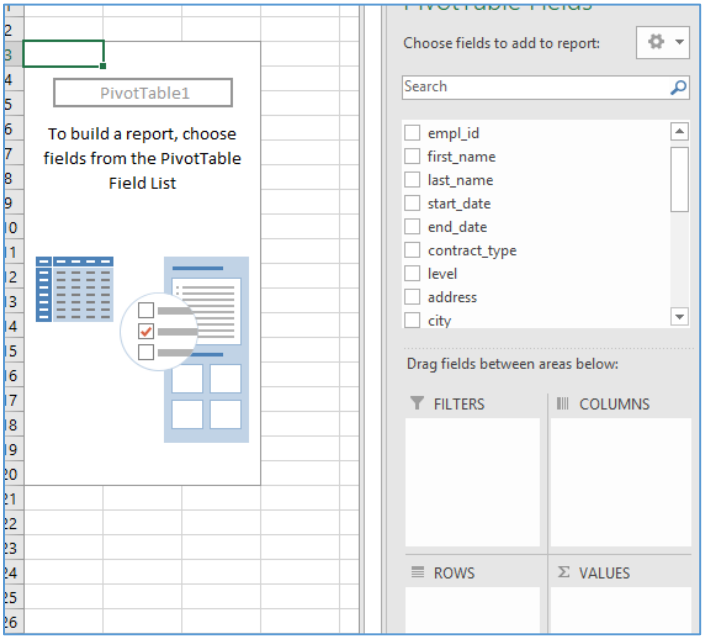




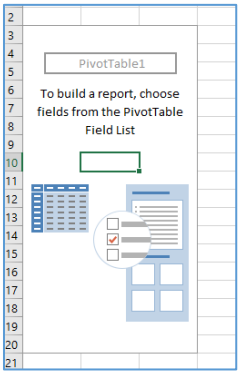
- Now try to add new data into the source Table
- Refresh the Pivot Table to see the updated data

3.2.2. *Create Fields*

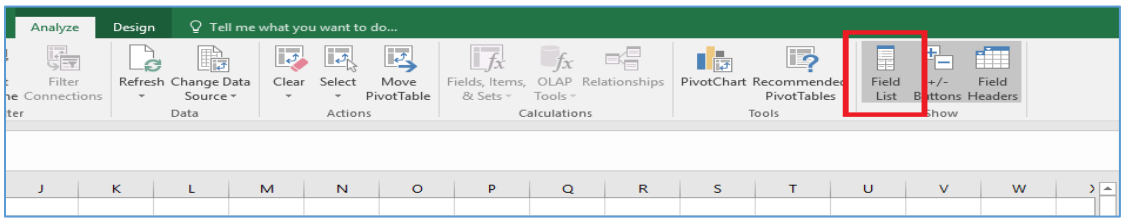
- After creating pivot, The **PivotTable Fields pane** appears. To get the total amount employees of each level sorted by type of contract, drag the following fields to the different areas.



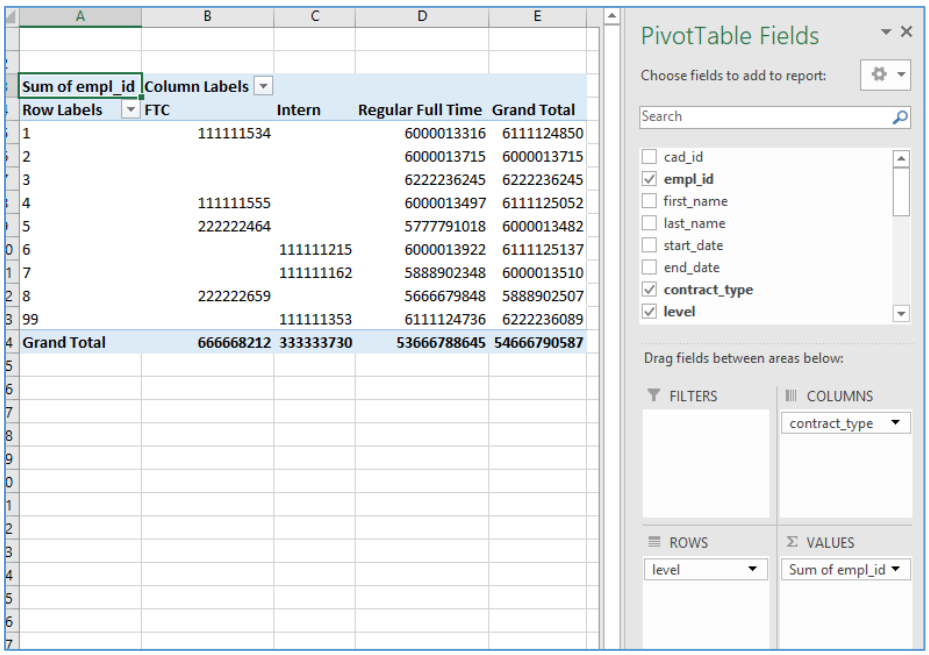
- If the PivotTable Fields menu does no apear on the right side, click on pivot table.



- Then click on Field List in analyze tab. Now you can continue with the set up of pivot in next step.

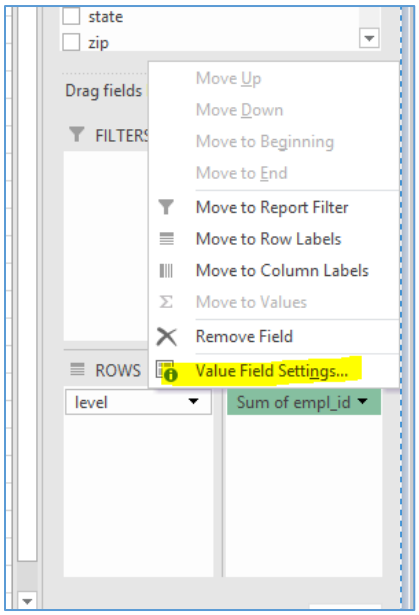


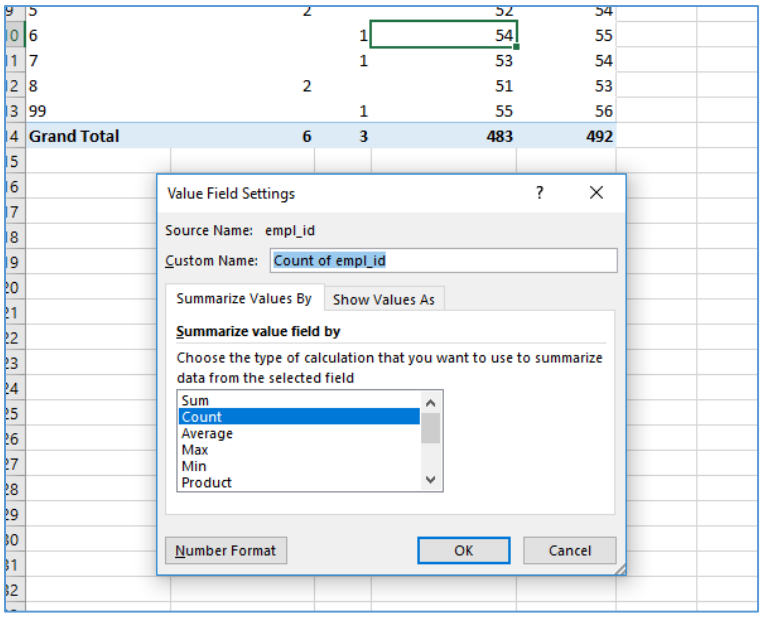
- level -> ROWS
- contract_type -> COLUMNS
- empl_id -> VALUES



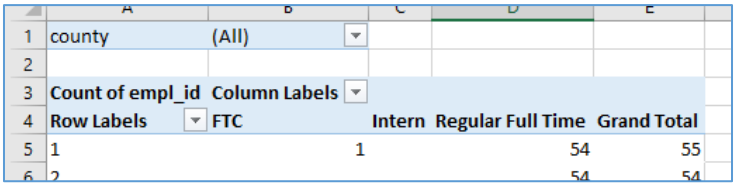
Sum of empl_id	Column Labels			
Row Labels	FTC	Intern	Regular Full Time	Grand Total
1	111111534		6000013316	6111124850
2			6000013715	6000013715
3			6222236245	6222236245
4	111111555		6000013497	6111125052
5	222222464		5777791018	6000013482
6		111111215	6000013922	6111125137
7		111111162	5888902348	6000013510
8	222222659		5666679848	5888902507
99		111111353	6111124736	6222236089
Grand Total	666668212	333333730	53666788645	54666790587

- As you can see the table does not show number of employees based on empl. Id, but sum of the employee id numbers. To change that, select in drop down menu on Sum of empl_ID and change the Summarize value to Count. Press OK.





- Now that we have the pivot, we would like to add a filter by state that the emp. lives in. To do that simply drag and drop the State into FILTERS.
- Filter will appear above the pivot



	A	B	C	D	E
1	county	(All)			
2					
3	Count of empl_id	Column Labels			
4	Row Labels	FTC	Intern	Regular Full Time	Grand Total
5	1		1	54	55
6	2			54	54

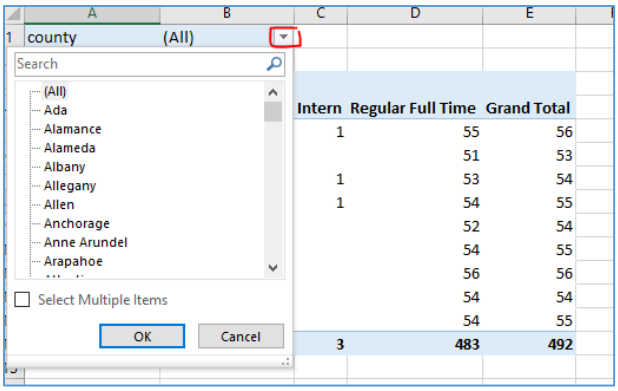
3.2.3. SORT

- Click any cell inside the Row Labels column
- Right click and click on Sort, Sort Largest to Smallest.

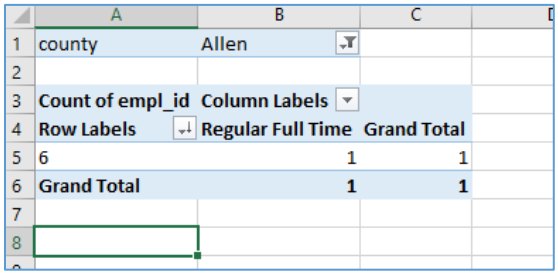
4	Row Labels	FTC	Intern	Regular Full Time	Grand Total
5	99		1	55	56
6	8		2	51	53
7	7		1	53	54
8	6		1	54	55
9	5		2	52	54
10	4		1	54	55
11	3			56	56
12	2			54	54

3.2.4. FILTER

- Because we added the Country field to the Filters area, we can filter this pivot table by Country.

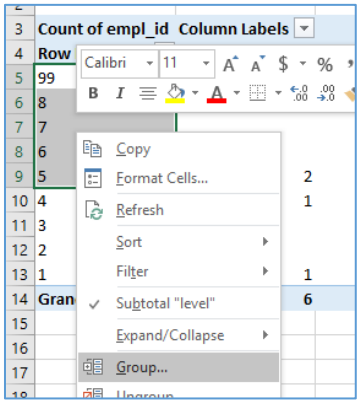


- If you select for example Allen the pivot will show only values for selected country.

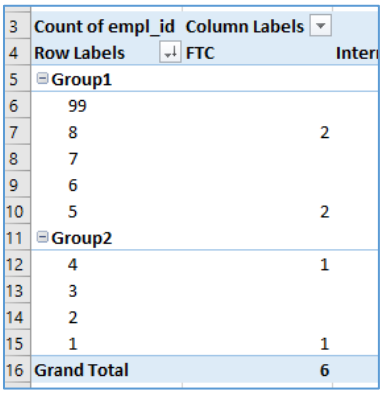


3.2.5. GROUP PIVOT TABLE ITEMS

- Another useful ability that Pivot Table has is Group, which allows you to group data based on similarities. For example, as you'll see below you can group dates into quarters, which gives you an option to expand the grouped dates into a new table.
  - Group values
    - In the pivot table, select 99-5
    - Right click and click on Group



- In the pivot table, select 4-1
- Right click and click on Group.



Count of empl_id	Column Labels	
Row Labels	FTC	Inter
Group1		
99		
8	2	
7		
6		
5	2	
Group2		
4	1	
3		
2		
1	1	
Grand Total	6	

Note: *to change the name of a group (Group1 or Group2), select the name, and edit the name in the formula bar. To ungroup, select the group, right click and click on Ungroup.*

- To collapse the groups, click the minus signs.

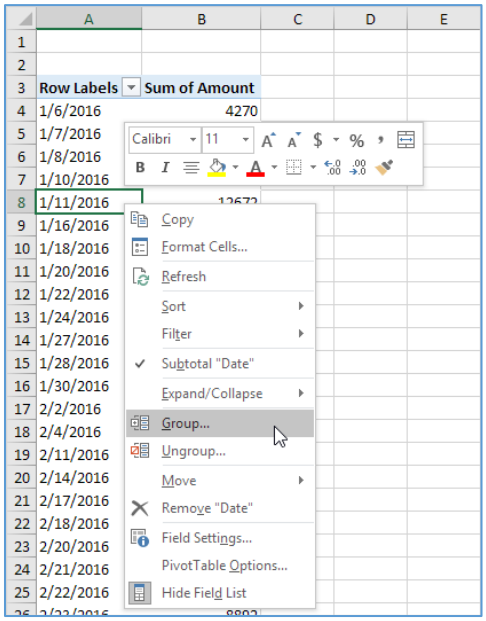
Count of empl_id	Column Labels			
Row Labels	FTC	Intern	Regular Full Time	Grand Total
⊞Group1	4	3	265	272
⊞Group2	2		218	220
Grand Total	6	3	483	492

Conclusion: (Group1) has a higher total than all the other (Group2) together.

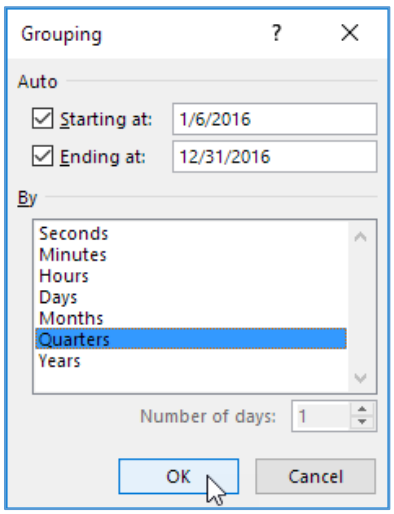
- Group dates
  - To create the pivot table below, instead of the level, add the Date field to the Rows area. The Date field contains many items. 1/6/2016, 1/7/2016, 1/8/2016, 1/10/2016, 1/11/2016, etc

Row Labels	Count of empl_id
1/1/2013	1
1/2/2013	1
1/14/2013	1
1/20/2013	1
1/25/2013	2
2/2/2013	1
2/3/2013	2
2/5/2013	2
2/9/2013	1
2/13/2013	1
2/21/2013	1
2/23/2013	1
2/26/2013	1

- To group these dates by quarters, execute the following steps
- Click any cell inside the column with dates
- Right click and click on Group.



- Select Quarters and click OK.



Note: *also see the options to group by seconds, minutes, hours, etc.*

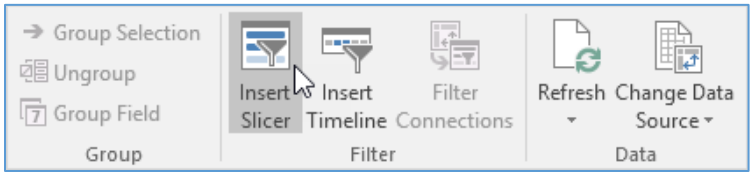
Row Labels	Count of empl_id
Qtr1	139
Qtr2	120
Qtr3	110
Qtr4	123
Grand Total	**492**

Conclusion: most people started in Qtr1

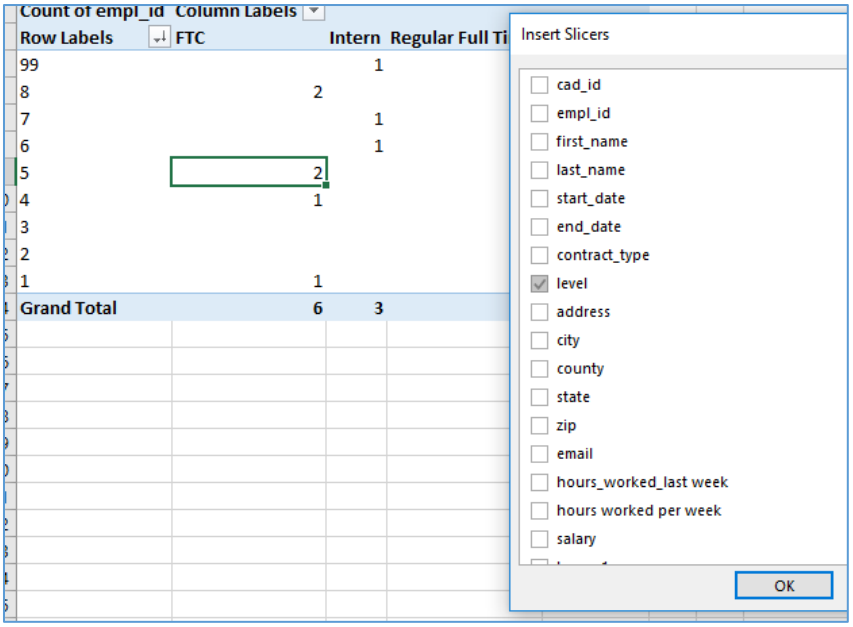
- As previously mentioned now you can expand only grouped population.
- Double click on the number in column Count of empl_ids, which will create new table in new sheet, filled only with employees for that given QTR.

3.2.6. SLICERS

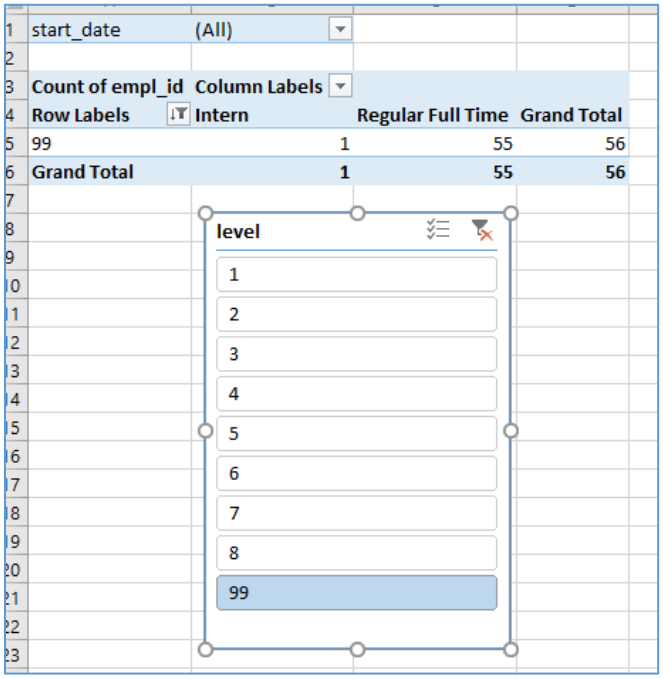
- **Slicers** are very useful feature that can be used for table, but most often you'll encounter it in combination with pivot tables. Though the principle is the same as regular filter, slicer gives you opportunity to make your pivot table visually appealing as well as much easier to read and navigate for casual user.
  - Click any cell inside the pivot table.
  - On the Analyze tab, in the Filter group, click Insert Slicer.



- Check level and click OK.

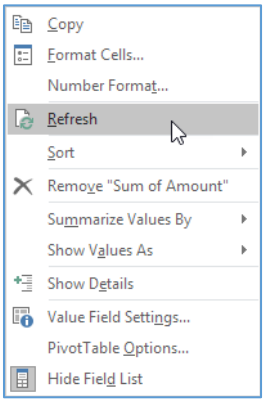


- For example, click level 99 to only show the green badge employees.



3.2.7. Update Pivot Table

- Any changes you make to the data set are not automatically picked up by the pivot table. **Refresh** the **pivot table** or **change the data source** to **update** the pivot table with the applied changes.



Note: *Once you get more familiar with creation of macros, you can either create button function, which will refresh the pivot when pressed or you can also create code that will update your pivot whenever you add data to the source file.*

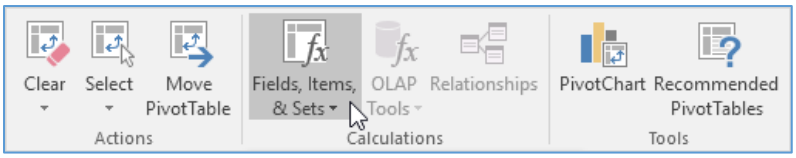
3.2.8. Calculated Field

- Calculated Field - A calculated field uses the values from another field. This feature gives you an option to adjust the results of pivot. You might need to use this for example when you look for pay rate after raise. You take the basic amount and add your value, which gives you new adjusted column.
  - At the beginning create simple table and pivot to reflect below.

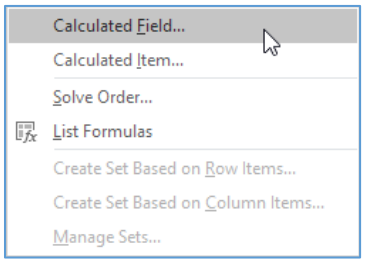
	A	B	C
1	ID	number	
2	111	22	
3	112	22	
4	113	12	
5			
6			
7			

2		
3	Row Labels	Sum of jmeno
4	111	22
5	112	22
6	113	12
7	Grand Total	56
8		
9		

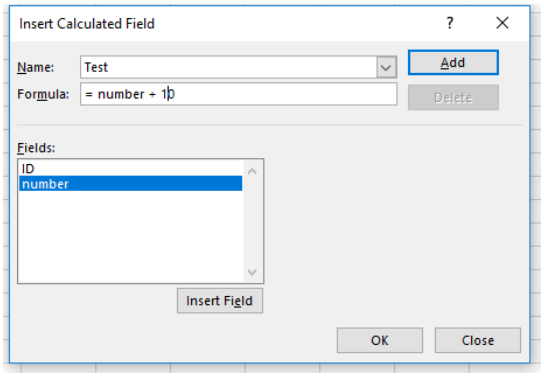
  - Click any cell inside the pivot table.
  - On the Analyze tab, in the Calculations group, click Fields, Items & Sets.



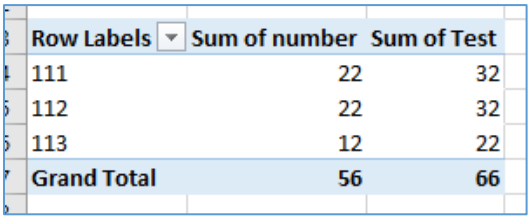
- Click Calculated Field.



- The Insert Calculated Field dialog box appears.



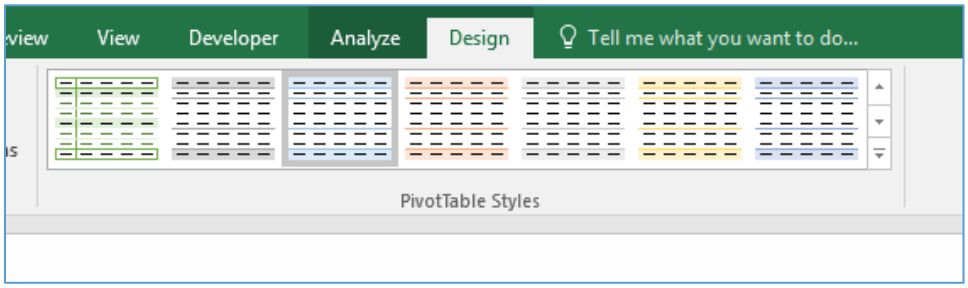
- Enter Test for Name.
- Type the formula =number + 10
- Click Add.
- Click OK



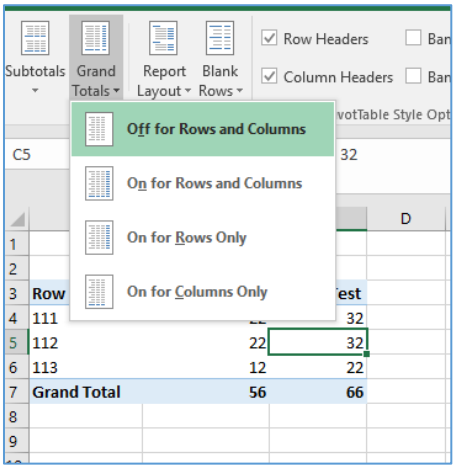
Row Labels	Sum of number	Sum of Test
111	22	32
112	22	32
113	12	22
Grand Total	56	66

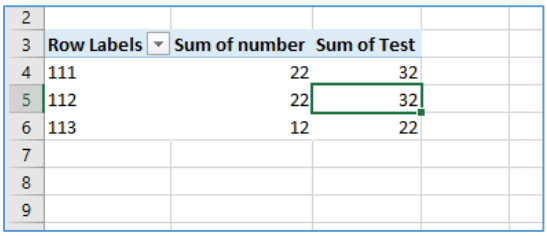
3.2.9. STRUCTURE

- Design
  - To change the design of your pivot go to Design tab in PivotTable Tools and choose different style or create your own.

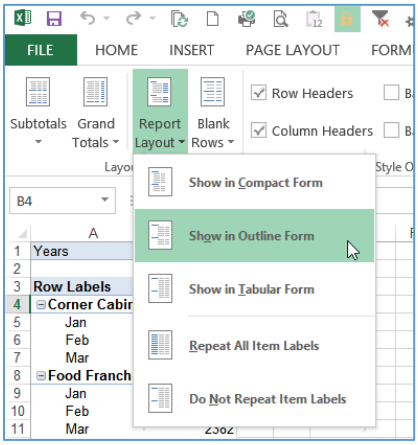


- Layout and Totals
  - Totals - In Layout section you can hide/show totals and subtotals of your pivot





  - Layout - When you create a new pivot table, it is automatically formatted with the Compact Form layout, by default. After you create the pivot table, you can change to one of the other layouts.



- Example
  - Compact Form - The default report layout for a pivot table is Compact Form, shown below. There are two Row fields -- Customer and Date.

	A	B
1	Years	(All)
2		
3	Row Labels	Sum of Qty
4	Corner Cabin	958
5	Jan	251
6	Feb	638
7	Mar	69
8	Food Franchise	991
9	Jan	318
10	Feb	156
11	Mar	517
12	Mega Market	600
13	Jan	220
14	Feb	253
15	Mar	127
16	Grand Total	2549
17		

  - Outline Form - each Row field is in a separate column, as you can see in the pivot table below. There are two Row fields -- Customer and Date

	A	B	C
1	Years	(All)	
2			
3	Customer	Date	Sum of Qty
4	Corner Cabin		958
5		Jan	251
6		Feb	638
7		Mar	69
8	Food Franchise		991
9		Jan	318
10		Feb	156
11		Mar	517
12	Mega Market		600
13		Jan	220
14		Feb	253
15		Mar	127
16	Grand Total		2549
17			

- Tabular Form - each Row field is in a separate column, as you can see in the pivot table below. There are two Row fields - Customer and Date. The Row labels are not in a separate row.

	A	B	C	D
1	Years	(All)		
2				
3	Customer	Date	Sum of Qty	
4	Corner Cabin	Jan	251	
5		Feb	638	
6		Mar	69	
7	Corner Cabin Total		958	
8	Food Franchise	Jan	318	
9		Feb	156	
10		Mar	517	
11	Food Franchise Total		991	
12	Mega Market	Jan	220	
13		Feb	253	
14		Mar	127	
15	Mega Market Total		600	
16	Grand Total		2549	
17				

3.3. GRAPHS

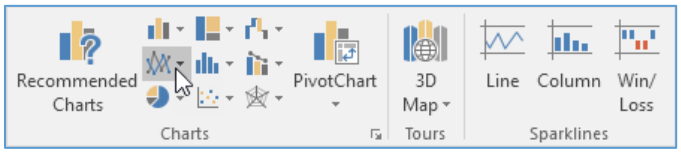
Generally speaking, Charts and Pivot charts are quite similar though differences can be found as you'll notice when working with pivots.

3.3.1. CREATE A CHART

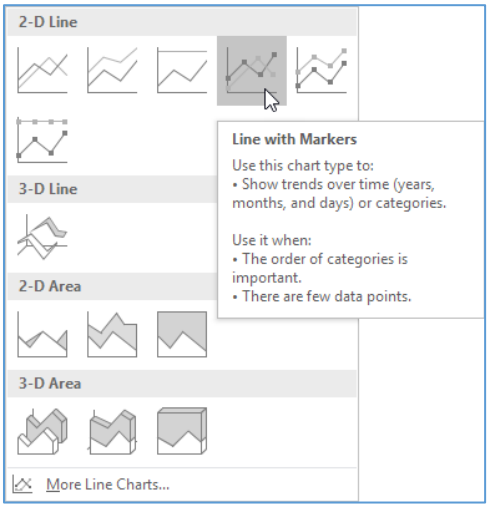
- Select the Table/Range

	Month	Termination	Onboardin	Promotion
2	Jan	20	60	20
3	Feb	35	4	20
4	Mar	77	8	3
5	Apr	1	68	4
6	May	22	8	19
7	Jun	5	0	6
8	Jul	8	8	20
9	Aug	0	2	20
10	Sep	66	7	1
11	Oct	7	16	12
12	Nov	2	11	2
13	Dec	12	50	0

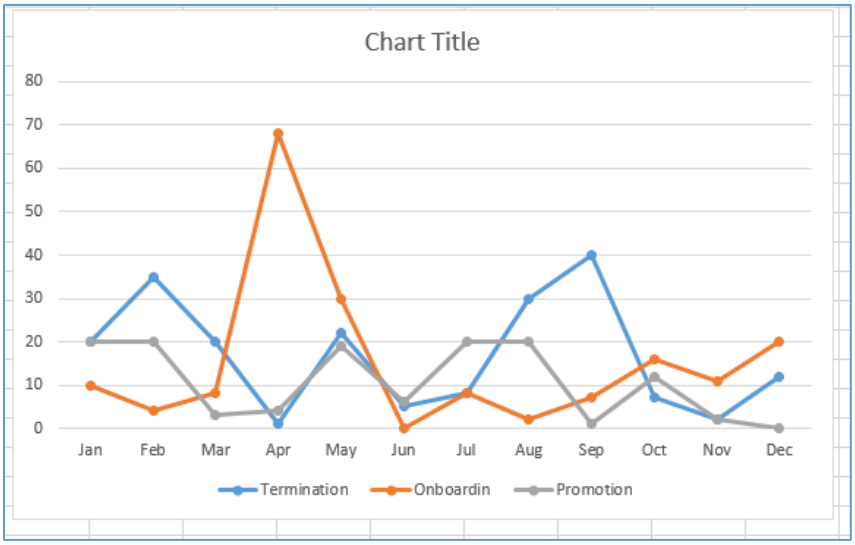
- On the Insert tab, in the **Charts** group, click the Line symbol



- Click Line with Markers.



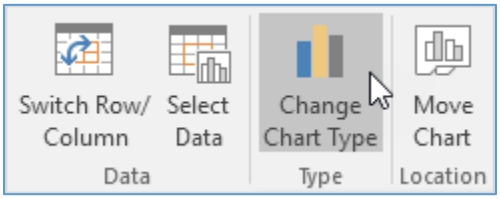
- Result



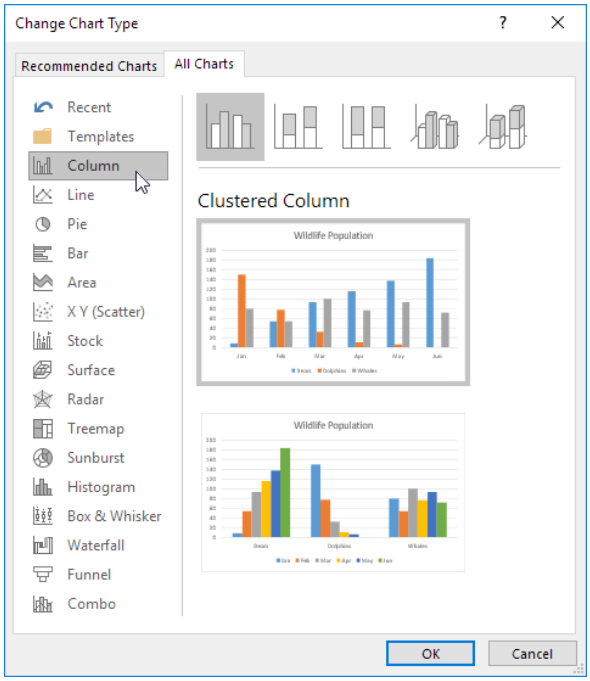
3.3.2. CHANGE CHART TYPE

You can easily change to a different type of chart at any time

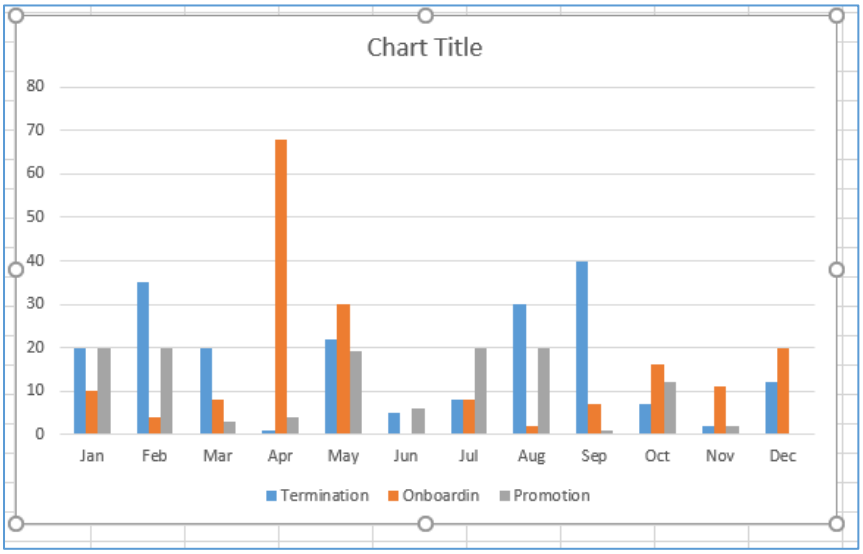
- Select the chart
- On the Design tab, in the Type group, click Change Chart Typ



- On the left side, click Column

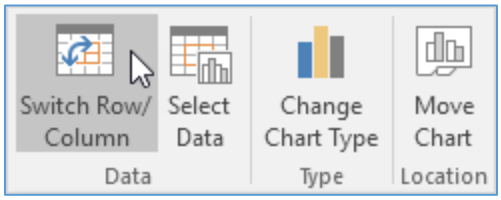


- Click OK

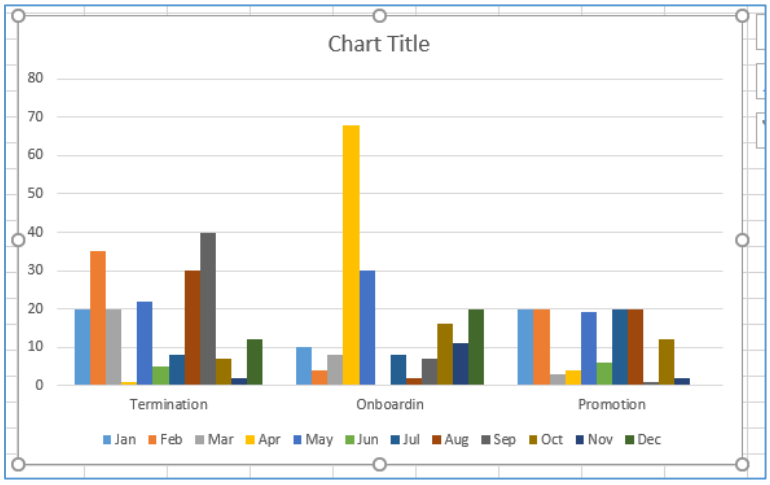


3.3.3. Switch Row/Column

- Select the chart.
- On the Design tab, in the Data group, click Switch Row/Column.
-



- Result



3.3.4. Types of Charts

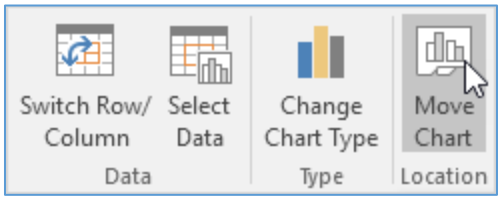
There are many different types of charts, depending on the use case, the most useful one may differ. List below names the ones you will most likely encounter the most.

- Column Chart
- Line Chart
- Pie Chart
- Bar Chart
- Area Chart
- Scatter Chart

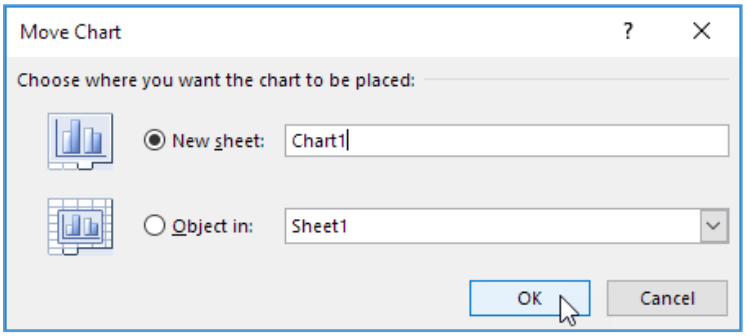
3.3.5. CHART SHEET

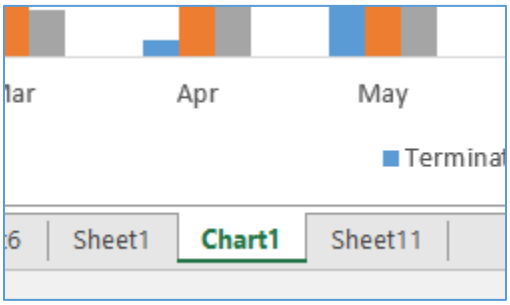
So far we've only used charts on the same worksheet as the source data (embedded charts). However, you can also move a chart to a separate sheet that only contains a chart (chart sheet)

- Select the chart.
- On the Design tab, in the Location group, click Move Chart



- Click New sheet and enter a name
- Click OK

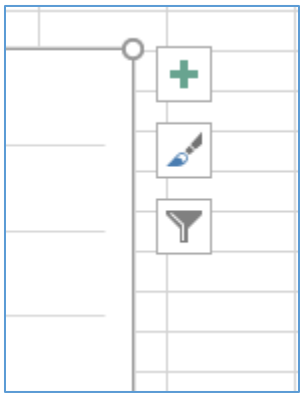




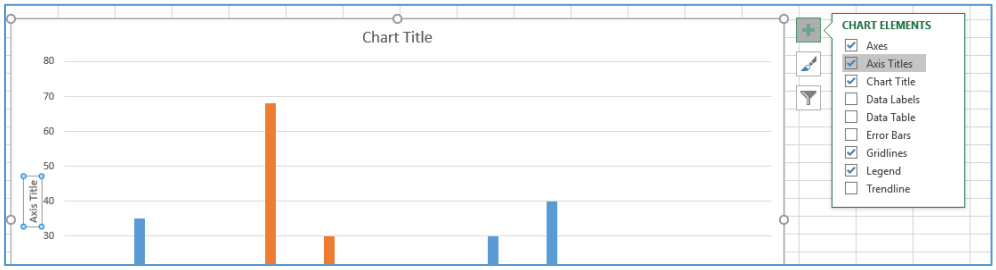
Note: *repeat these steps, but instead of New sheet at step 3, click Object in, to move the chart back to the same worksheet as the source data.*

3.3.6. CUSTOMIZE A CHART

- Change name by clicking on Chart Title
- You can also customize your chart by using options in the right upper corner.



  - For example, you can add Title for axis



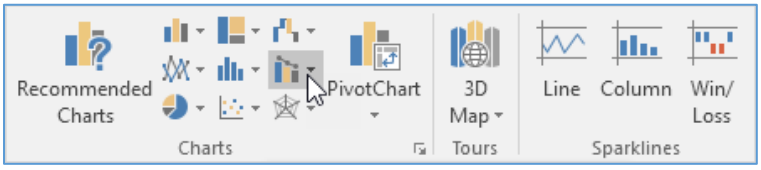
3.3.7. COMBINATION CHART

A combination chart is a chart that combines two or more chart types in a single chart

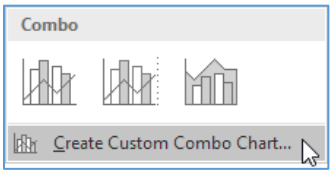
- Select the range/table

	A	B	C
1	Month	Number of A	Number of
2	Jan	20	10
3	Feb	35	4
4	Mar	20	8
5	Apr	1	68
6	May	22	30
7	Jun	5	0
8	Jul	8	8
9	Aug	30	2
10	Sep	40	7
11	Oct	7	16
12	Nov	2	11
13	Dec	12	20
14			

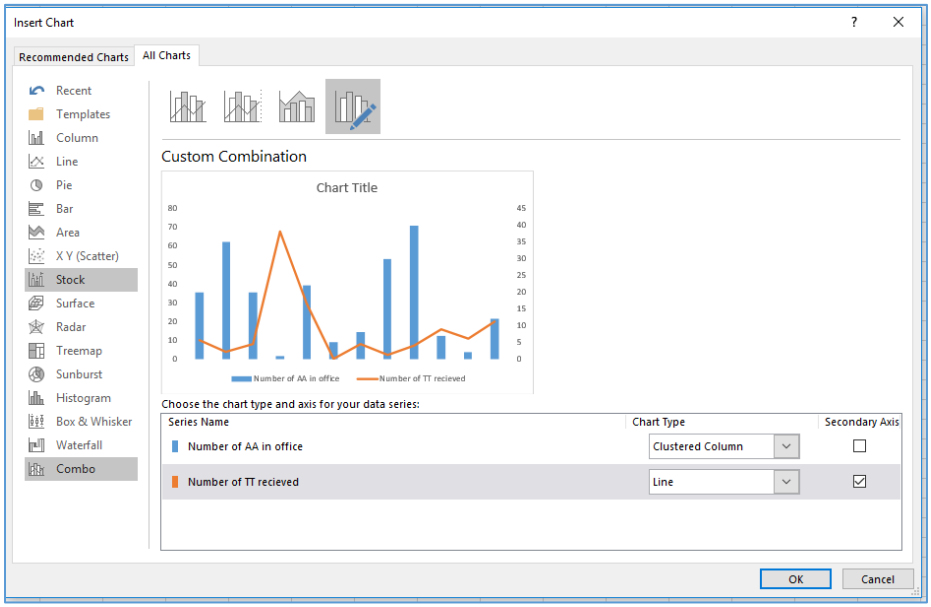
- On the Insert tab, in the Charts group, click the Combo symbol



- Click Create Custom Combo Chart.



- For the Number of AA in the office series, choose Clustered Column as the chart type
- For the Number of TT received, choose Line as the chart type
- Plot the Number of TT received series on the secondary axis


Insert Chart
Recommended Charts
All Charts
Recent
Templates
Column
Line
Pie
Bar
Area
X Y (Scatter)
Stock
Surface
Radar
Treemap
Sunburst
Histogram
Box & Whisker
Waterfall
Combo
Custom Combination
Chart Title
Number of AA in office
Number of TT recieved
Choose the chart type and axis for your data series:
Series Name
Chart Type
Secondary Axis
Number of AA in office
Clustered Column
Number of TT recieved
Line
OK
Cancel

- Click OK.

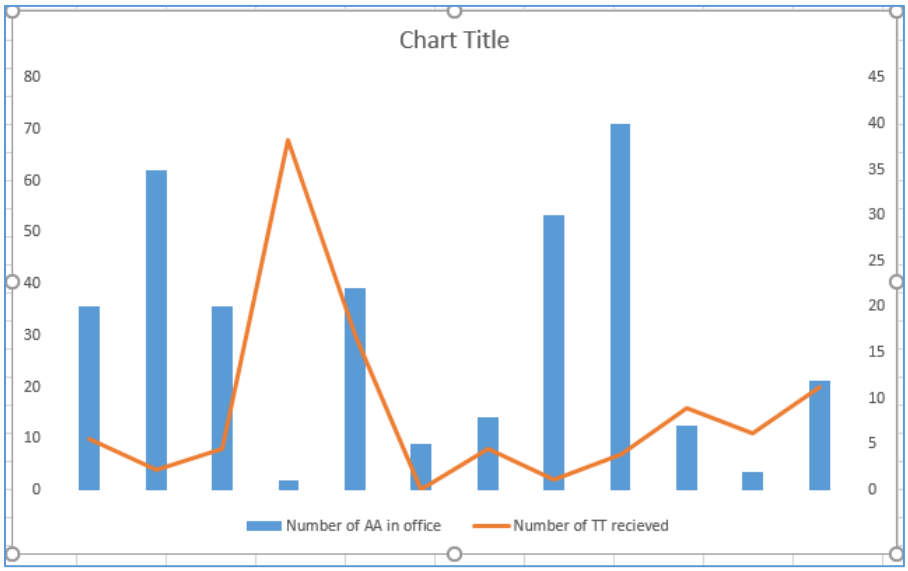


Chart Title
80
70
60
50
40
30
20
10
0
45
40
35
30
25
20
15
10
5
0
Number of AA in office
Number of TT recieved

4. Closing Exercise

Complete exercise using below steps and requirements.

1) From the source file create custom table where header is yellow and header text is blue. All cells in the table are outlined with dotted line.
2) Create pivot from your table into a cell D7 in existing sheet named PIVOT
3) Set up the pivot to match below

- Rows – last name
- Columns – CTI
- Values – TT number
- Filter – one slicer to contain year and second to contain month

4) Hide grand totals for columns
5) Create two charts

- 1st shows overview of the TTs. Place legend to the bottom of chart. Hide any visible filters within the chart. Create chart title (TT overview).
- 2nd shows line for grand total of TTs per person. No legend is necessary. Title should say “Total”.

5. Additional knowledge

How to:

https://edu.gcfglobal.org/en/excel2013/charts/1/

https://www.smartsheet.com/how-to-make-charts-in-excel

Chart tricks:

https://searchengineland.com/10-tips-to-make-your-excel-charts-sexier-135407