Lecture Note #10: Conditional Formatting Part #2

BUSI 201: Business Data Analysis

Topic 1. Conditional Formatting: More Options

Last lecture we examined how conditional formatting can assist data analysis by visualizing certain elements, or certain rows that met our conditions. This time, we will be examining three more types of conditional formatting which are more graph-adjacent. These three types are data bars, color schemes, and icon sets.
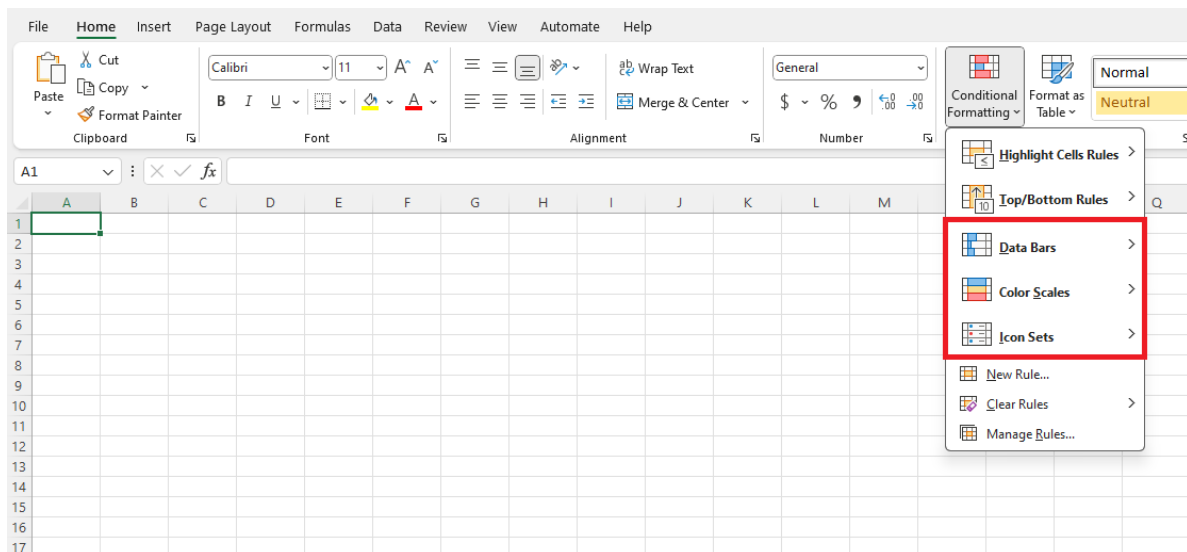

Figure 1: Conditional Formatting

The main difference between the topics we covered in the previous lecture and these is related to the difference between tables and data. Last lecture's tools were more geared towards directly analyzing the data, and noticing patterns, selecting out certain values, etc. Today's tools are heavily geared towards the analysis of tables.

That being said, there is no clear rule stating that certain conditional formatting can exclusively be used in the analysis of data vs. tables, and each case should be carefully considered on an individual basis.

Topic 2. Conditional Formatting: Data Bars

Please navigate to SALES sheet of the workbook BUSI201-LEC11-Workbook. This worksheet consists of a fictitious sales data for 12 sales representatives over a given period of time. We can use data bars to add a background effect to a cell based on the number that the cell contains. The bar (by default) will be longer the larger the number, and shorter the smaller the number.
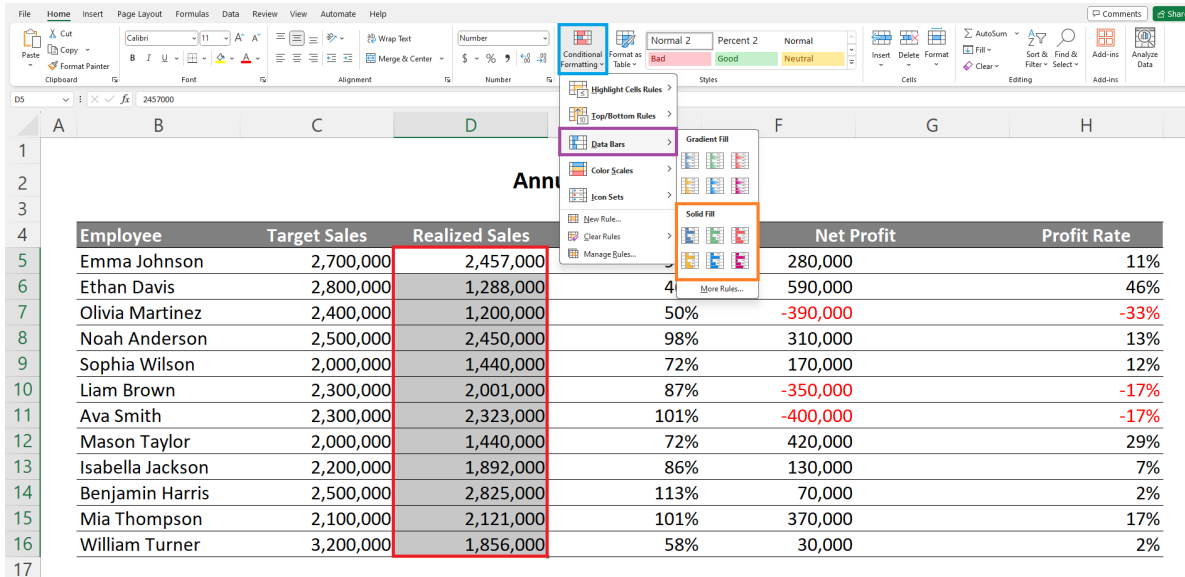

Figure 2: Data Bars

We will try out Data Bars on the table, specifically on the information on the realized sales value of each employee. First, select the zone where the data bars should be applied, highlighted by the red box in Figure 2. Then select Conditional Formatting in the blue box, Data Bars in the purple box, and finally choose any color under Solid Fill in the orange box.
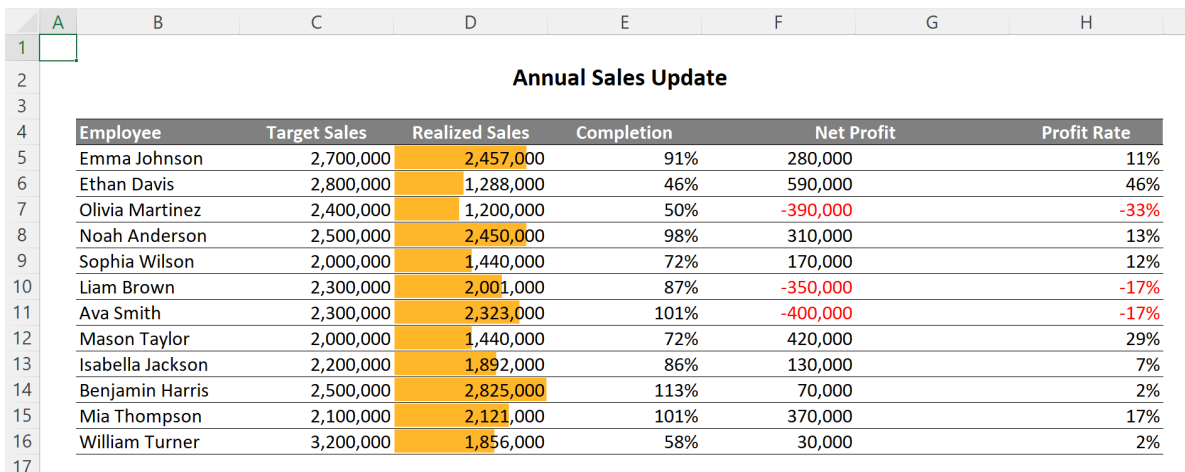

Figure 3: Orange Data Bars

Data Bar Rules: Min / Max Values

The default data bars have an automatically set minimum and maximum value. This window of minimum and maximum values are often set quite wide, which allows some flexibility in case any numbers change in the table. However it is not helpful if we want to accentuate the difference in performance among the employees.
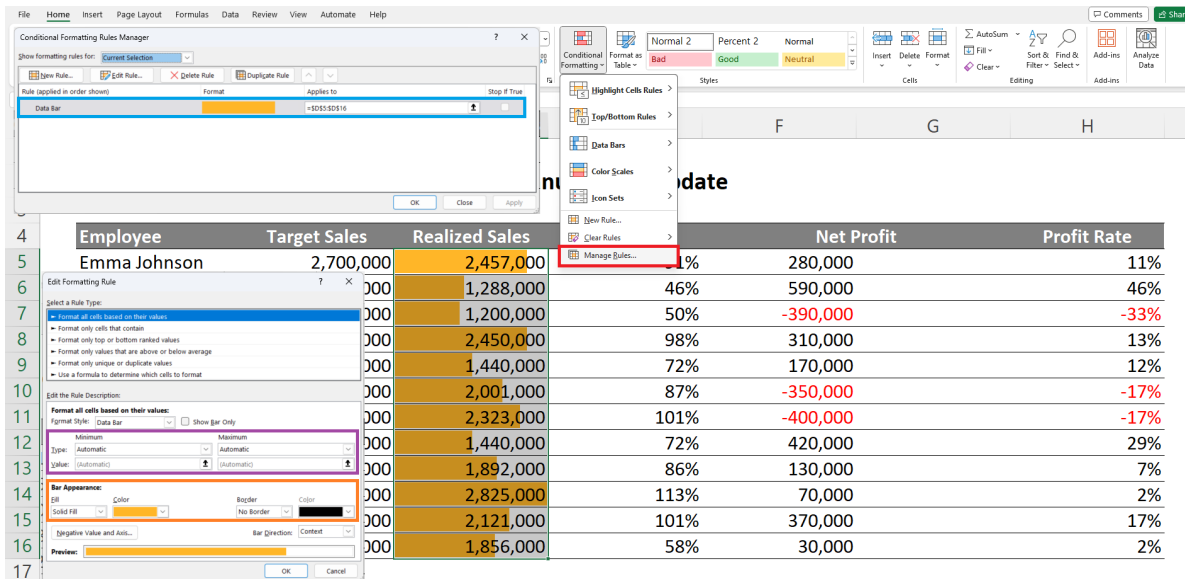

Figure 4: Data Bar Min/Max Values

Select the cells that contain the data bars, and navigate to `Conditional Formatting > Manage Rules` highlighted by the red box in Figure 4. In the window that popped up, double-click the data bar rule highlighted in the blue box to call up the `Edit Formatting Rule` window. The area in the purple box contains the options to change the minimum and maximum reference values. Change the current `Automatic` to `Lowest Value` and `Maximum Value`.

	Employee	Target Sales	Realized Sales	Completion	Net Profit	Profit Rate
	Annual Sales Update					
5	Emma Johnson	2,700,000	2,457,000	91%	280,000	11%
6	Ethan Davis	2,800,000	1,288,000	46%	590,000	46%
7	Olivia Martinez	2,400,000	1,200,000	50%	-390,000	-33%
8	Noah Anderson	2,500,000	2,450,000	98%	310,000	13%
9	Sophia Wilson	2,000,000	1,440,000	72%	170,000	12%
10	Liam Brown	2,300,000	2,001,000	87%	-350,000	-17%
11	Ava Smith	2,300,000	2,323,000	101%	-400,000	-17%
12	Mason Taylor	2,000,000	1,440,000	72%	420,000	29%
13	Isabella Jackson	2,200,000	1,892,000	86%	130,000	7%
14	Benjamin Harris	2,500,000	2,825,000	113%	70,000	2%
15	Mia Thompson	2,100,000	2,121,000	101%	370,000	17%
16	William Turner	3,200,000	1,856,000	58%	30,000	2%

Figure 5: Data Bar Min/Max Values Applied

Data Bar Rules: Colors and Borders

Choosing an inappropriate color would make reading the numbers in the cell a bit difficult. For a white background with black text, the orange data bars would be suitable as shown in Figure 3. If you wish to change the colors or add borders to the data bars, you can navigate to the `Edit Formatting Rule` window following the steps in Figure 4. Use the tools given in the orange box under `Bar Apprearance`. Figure 6 shows an alternate style using gradients, and borders in the data bar.

Employee	Target Sales	Realized Sales	Completion	Net Profit	Profit Rate
Emma Johnson	2,700,000	2,457,000	91%	280,000	11%
Ethan Davis	2,800,000	1,288,000	46%	590,000	46%
Olivia Martinez	2,400,000	1,200,000	50%	-390,000	-33%
Noah Anderson	2,500,000	2,450,000	98%	310,000	13%
Sophia Wilson	2,000,000	1,440,000	72%	170,000	12%
Liam Brown	2,300,000	2,001,000	87%	-350,000	-17%
Ava Smith	2,300,000	2,323,000	101%	-400,000	-17%
Mason Taylor	2,000,000	1,440,000	72%	420,000	29%
Isabella Jackson	2,200,000	1,892,000	86%	130,000	7%
Benjamin Harris	2,500,000	2,825,000	113%	70,000	2%
Mia Thompson	2,100,000	2,121,000	101%	370,000	17%
William Turner	3,200,000	1,856,000	58%	30,000	2%

Annual Sales Update

Figure 6: Data Bar Color Options Applied

Data Bars in Adjacent Cells

Data bars do not necessarily have to populate the cells that contain the data itself. Depending on the surrounding formatting style, having the data bar in the same cells may not be the most effective method to visualize the data. In this section we will learn how to create a data bar corresponding to the data in adjacent cells. While there is no (as far as the instructor knows) canned procedure, we will try a workaround.

Employee	Target Sales	Realized Sales	Completion	Net Profit		Profit Rate
Emma Johnson	2,700,000	2,457,000	91%	280,000	=F5	11%
Ethan Davis	2,800,000	1,288,000	46%	590,000		46%
Olivia Martinez	2,400,000	1,200,000	50%	-390,000	-390,000	-33%
Noah Anderson	2,500,000	2,450,000	98%	310,000	310,000	13%
Sophia Wilson	2,000,000	1,440,000	72%	170,000	170,000	12%
Liam Brown	2,300,000	2,001,000	87%	-350,000	-350,000	-17%
Ava Smith	2,300,000	2,323,000	101%	-400,000	-400,000	-17%
Mason Taylor	2,000,000	1,440,000	72%	420,000	420,000	29%
Isabella Jackson	2,200,000	1,892,000	86%	130,000	130,000	7%
Benjamin Harris	2,500,000	2,825,000	113%	70,000	70,000	2%
Mia Thompson	2,100,000	2,121,000	101%	370,000	370,000	17%
William Turner	3,200,000	1,856,000	58%	30,000	30,000	2%

Annual Sales Update

Figure 7: Adjacent Cells

Copy the values under `Net Profit` to the empty cells to the right as shown in Figure 7.[1] Then, select the newly added values, and navigate to `Conditional Formatting > Data Bars > More Rules` in the red box. Check the `Show Bar Only` in the blue box, and check the options for negative values by clicking `Negative Value and Axis` in the purple box.
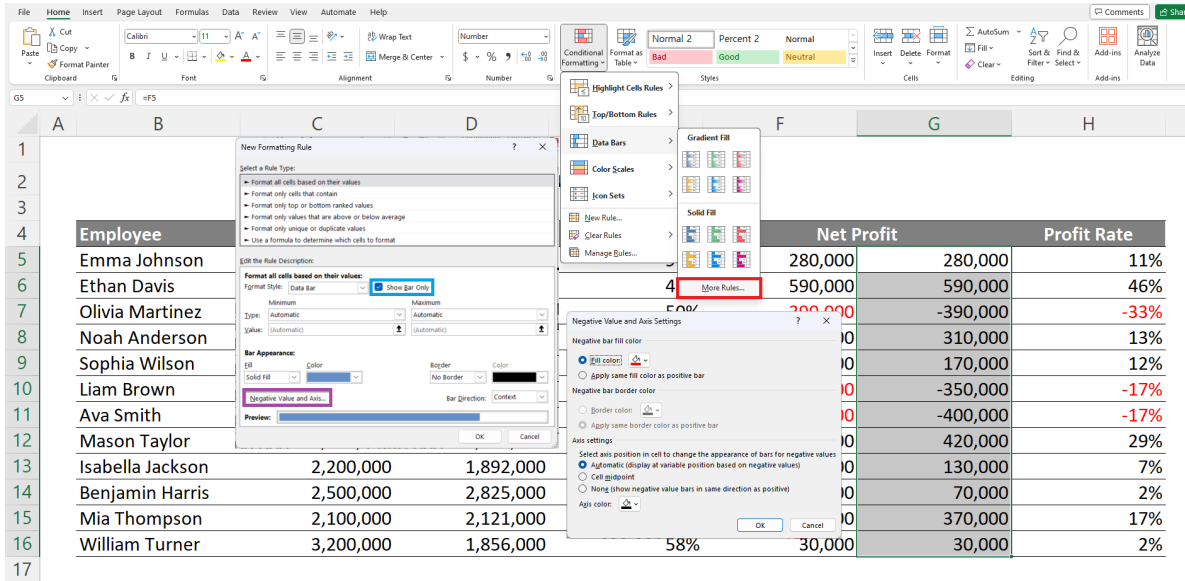

Figure 8: Data Bars in Adjacent Cells Options

At the moment, we will not change any options for negative values or the axis. Finalizing the options, and applying the conditional formatting, the data bars displayed in Figure 9. Compare your experience reading the original `Net Profit`, and the result we have now.

Figure 9: Data Bars in Adjacent Cells Applied

Topic 3. Conditional Formatting: Icon Sets

In addition to adding data bars, Excel also allows its users to add icons to assist in data visualization. To illustrate the use of icon sets, we will use icon sets to classify the employees' sales completion rates.
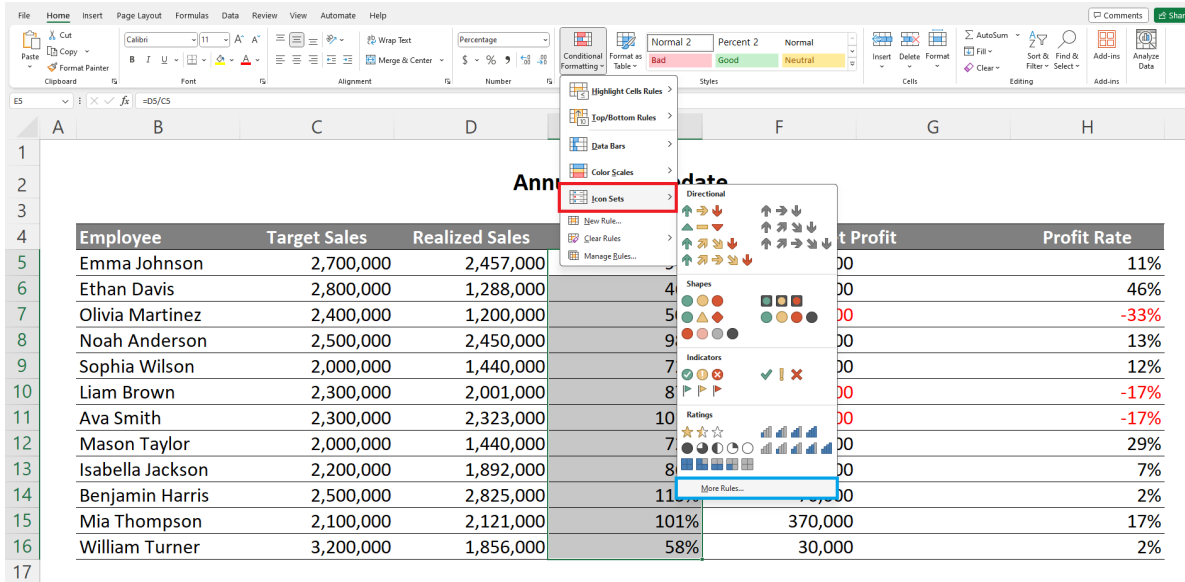

Figure 10: Icon Sets

To apply conditional formatting to display icons, select the cells that contains the data, and navigate to `Conditional Formatting > Icon Sets` in the red box in Figure 10. You may use any of the preset icons that show up, but for the purpose of this activity we will select `More Rules` in the blue box.
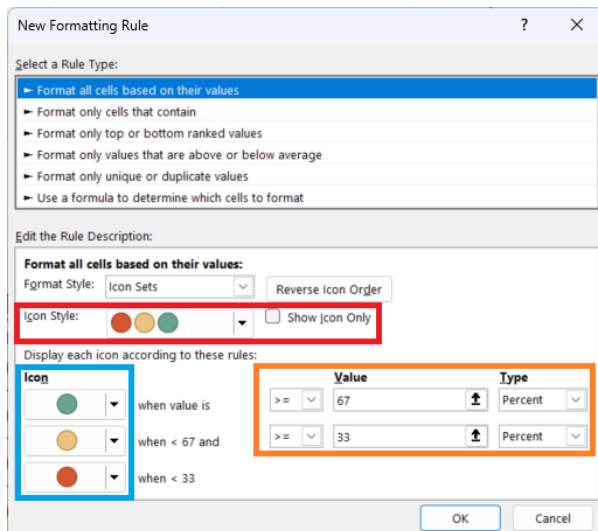

Figure 11: New Formatting Rule

Opening the `New Formatting Rule` window, we may set up the rules for the icons. First, in the red box we can choose different icon styles, or completely replace the cell values with the icons as we did in Figure 9.

Then we can change the icons in the icon set using the options in the blue box, and edit the cutoff thresholds by changing the values and options in the orange box. Try out setting an arbitrary cutoff for the green, yellow, and red circles to complement the numerical completion rate.

	A	B	C	D	E	F	G	H

Annual Sales Update

Employee	Target Sales	Realized Sales	Completion	Net Profit	Profit Rate
Emma Johnson	2,700,000	2,457,000 🟢	91%	280,000	11%
Ethan Davis	2,800,000	1,288,000 🔴	46%	590,000	46%
Olivia Martinez	2,400,000	1,200,000 🟡	50%	-390,000	-33%
Noah Anderson	2,500,000	2,450,000 🟢	98%	310,000	13%
Sophia Wilson	2,000,000	1,440,000 🟡	72%	170,000	12%
Liam Brown	2,300,000	2,001,000 🟢	87%	-350,000	-17%
Ava Smith	2,300,000	2,323,000 🟢	101%	-400,000	-17%
Mason Taylor	2,000,000	1,440,000 🟡	72%	420,000	29%
Isabella Jackson	2,200,000	1,892,000 🟢	86%	130,000	7%
Benjamin Harris	2,500,000	2,825,000 🟢	113%	70,000	2%
Mia Thompson	2,100,000	2,121,000 🟢	101%	370,000	17%
William Turner	3,200,000	1,856,000 🟡	58%	30,000	2%

Figure 12: Icon Sets Applied

Using the number 0.8 as the cutoff for the green circle, and the number 0.5 as the cutoff for the yellow circle, we obtain the result in Figure 12.

Topic 4. Data Visualization: Sparklines

This next topic is not quite conditional formatting, but shares some similarities. Sparklines are small graphs that we can embed within a cell that can be used to visualize trends over time. To try this feature out, please navigate to the SALESQ worksheet, which contains some sales data for a year, divided up by employee-quarters.
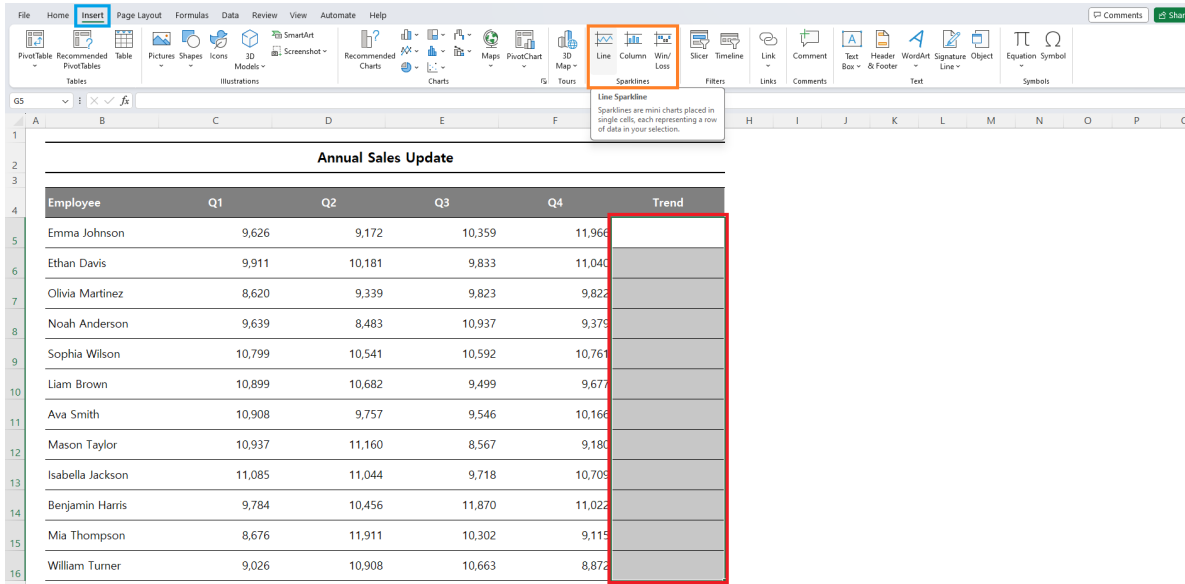

Figure 13: Sparklines

To apply sparklines, first select the cells where we want to add the graphs. In Figure 13, it is highlighted by the red box. Then select Insert in the blue box, and then observe the three different types of sparklines highlighted in the orange box. For this example, we will be using the Line option:
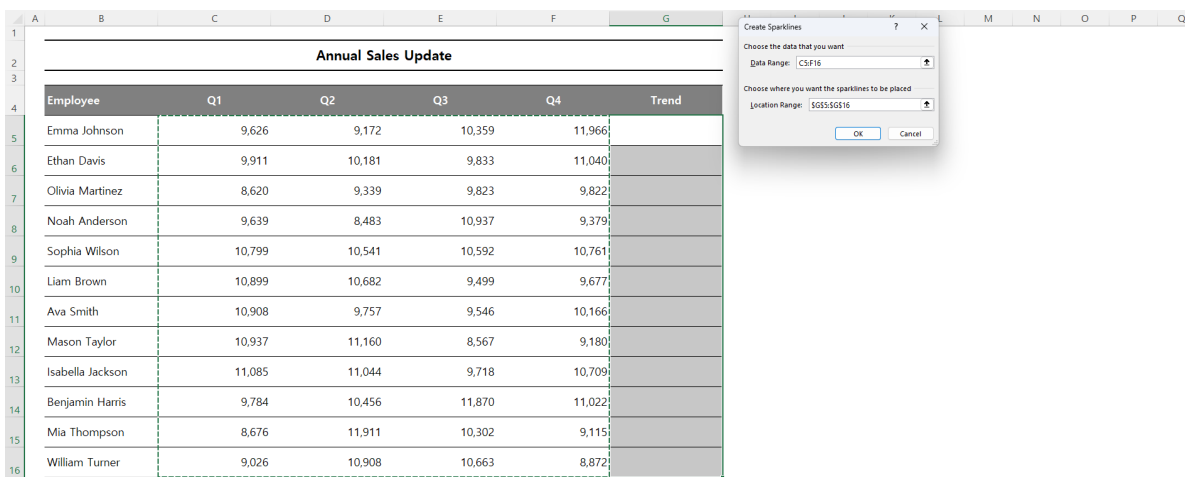

Figure 14: Sparklines Setup

Select the range that contains the data that we will be using for the sparkline as shown in Figure 14, and click OK to apply the sparklines.
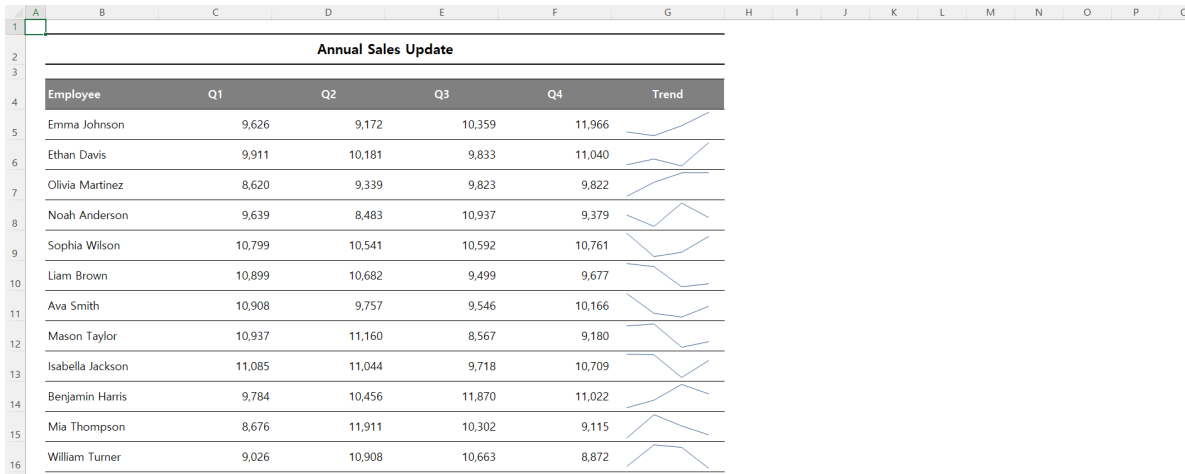

Figure 15: Sparklines Applied

Accessing Sparkline Options

The three types of sparklines each have their "best-use" cases. The Line types are often used to show or highlight a trend in the data, Column can be used to show trends as well, but it is often used to highlight the highest / lowest value in the time series. Finally, Win/Loss visualizes data based on positive/negative values, regardless of the magnitude of the numbers. To try out other formats, click on one of the newly added sparklines, and a Sparkline tab will appear as shown in Figure 16.
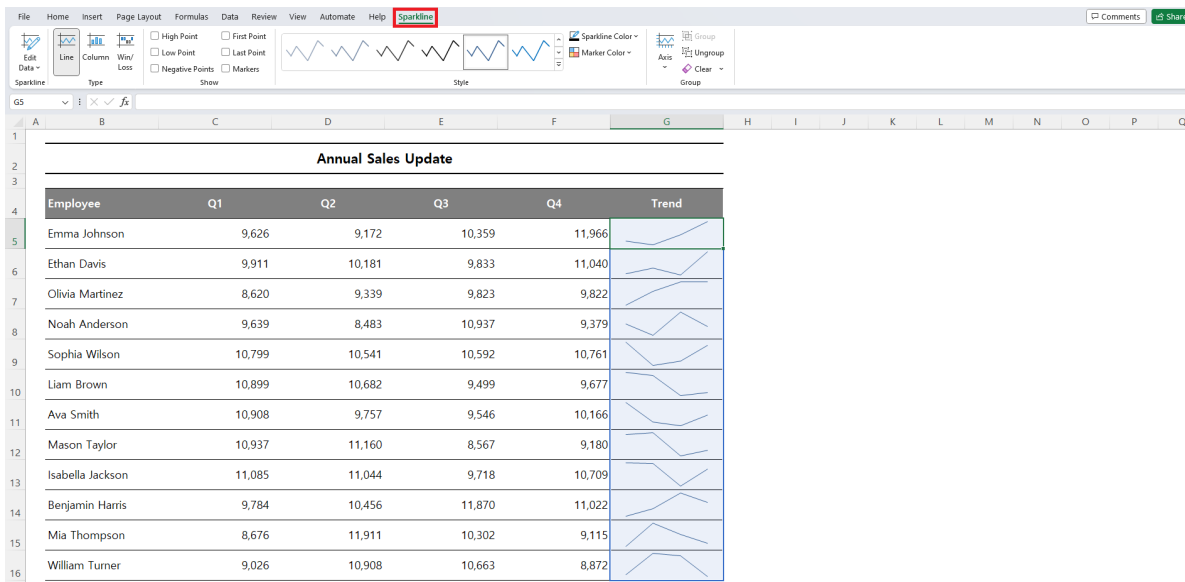

Figure 16: Sparkline Options

Sparkline Options: Lines

There are a number of options that allow us to customize the sparklines. First, the purple box contains some options to accentuate certain values in the time series. It allows the user to show the high point, low point, first occurrence, last occurrence, negative points, and markers for the individual data points. Try activating and deactivating each option to see what each option will add to your graph.

Next clicking the red box opens up a set of some predetermined graph options. If none of the given options are unsatisfactory, you may manually set the sparkline color and marker colors through the options in the blue box and orange box, respectively.
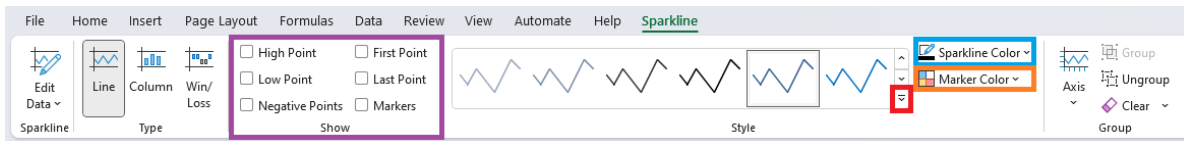

Figure 17: Sparkline Options: Lines

Sparkline Options: Columns

We can freely alternate between the different types of sparklines by clicking on the options Type. For instance, clicking on the Column option in the red box in Figure 18, we can change the lines to a bar graph. See the changes in the orange box, and notice the changes in the Style option in the blue box.
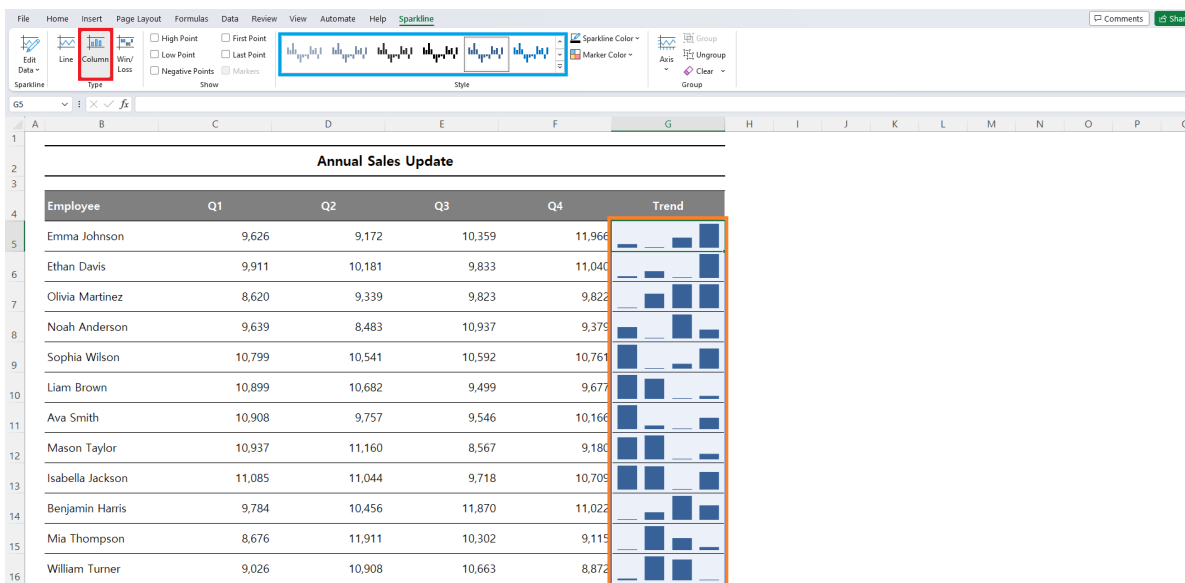

Figure 18: Sparkline Options: Lines