Ranking

In this practice, you will learn how to organize data in an Excel spreadsheet by rank.

> ### Practice Spreadsheet
>
> Use this [workbook](#) for the chapter.

Maximum and Minimum

Looking at the table, notice the different columns: employee, position, age, college GPA, and salary. Let's suppose that we wanted to find the oldest age in this list of employees.

We could scan the list with our eyes and find the answer that way, but suppose the list was much longer, perhaps thousands of rows. You wouldn't be able to do that. However, there is a way to have Excel calculate the answer for us.

D	E	F	G	
Age	**College GPA**	**Salary**		
49	3.92	$36,000		Max
25	2.55	$52,000		Min
50	3.57	$74,000		3rd Lar
36	2.64	$48,000		4th sma
44	3.62	$62,000		

Figure 7.1

In this practice, we will explore how to find the maximum age, the minimum, the third-largest, and the fourth smallest. Type these into 4 cells in the same column, then copy and paste the headers for **Age, College GPA,** and **Salary** in the next three columns. (See **Figure 7.1**)

Let's begin with the maximum age. Complete the following steps.

1. Type **=MAX** into the cell, followed by an open parentheses.
2. Select all the values in the **Age** column, then close the parentheses and push **Enter**.

This will automatically calculate the maximum age from the selected range. Your formula should look similar to the one in **Figure 7.2**.

D	E	F	G	H		I	
Age	College GPA	Salary				Age	
49	3.92	$36,000		Ma=MAX(D3:D17			
25	2.55	$52,000		Min MAX(number1, [number2], ...)			
50	3.57	$74,000		3rd Largest			
36	2.64	$48,000		4th smallest			
44	3.62	$62,000					
52	3.38	$59,000					
24	3.47	$48,000					
31	2.88	$51,000					
45	2.88	$58,000					
30	3.93	$38,000					
37	2.31	$55,000					
24	3.66	$22,000					
31	3.65	$60,000					
40	2.34	$46,000					
48	3.33	$40,000					

Figure 7.2

To calculate the minimum age, do the following in the cell beside the one labeled **Min**.

1. Type **=MIN** into the cell, followed by an open parentheses.
2. Select all the values in the same range as before, then close the parentheses and push **Enter**.

This will automatically calculate the minimum age from the selected range.

Large and Small Functions

To find the third-largest, there is a formula called "large" that allows you to find within a given array, what largest number you would find. This is represented in the formula as **k**. This variable tells Excel which number "largest" you'd like to identify. For example, in the circumstance of third largest, *k* would equal three. (See **Figure 7.3**)

Figure 7.3

To calculate the third-largest, do the following in the cell beside the one labeled **Min**.

1. Type **=LARGE** into the cell, followed by an open parentheses.
2. Select all the values in the same range as before, replace the spot for *k* with **3**, then close the parentheses and push **Enter**.

This principle is also applicable to finding, for example, the fourth smallest. This formula is called "small."

1. Type **=SMALL** into the cell, followed by an open parentheses.
2. Select all the values in the same range as before, replace the spot for *k* with **4**, then close the parentheses and push **Enter**. (See **Figure 7.4**)

Figure 7.4

Matching the Format

Now, because we didn't anchor the references for these functions, we can drag them across to calculate the maximum and the minimum for GPA and salary as well. Since we want the number formats to match, use the format painter.

1. Select one row of the original age, GPA, and salary.
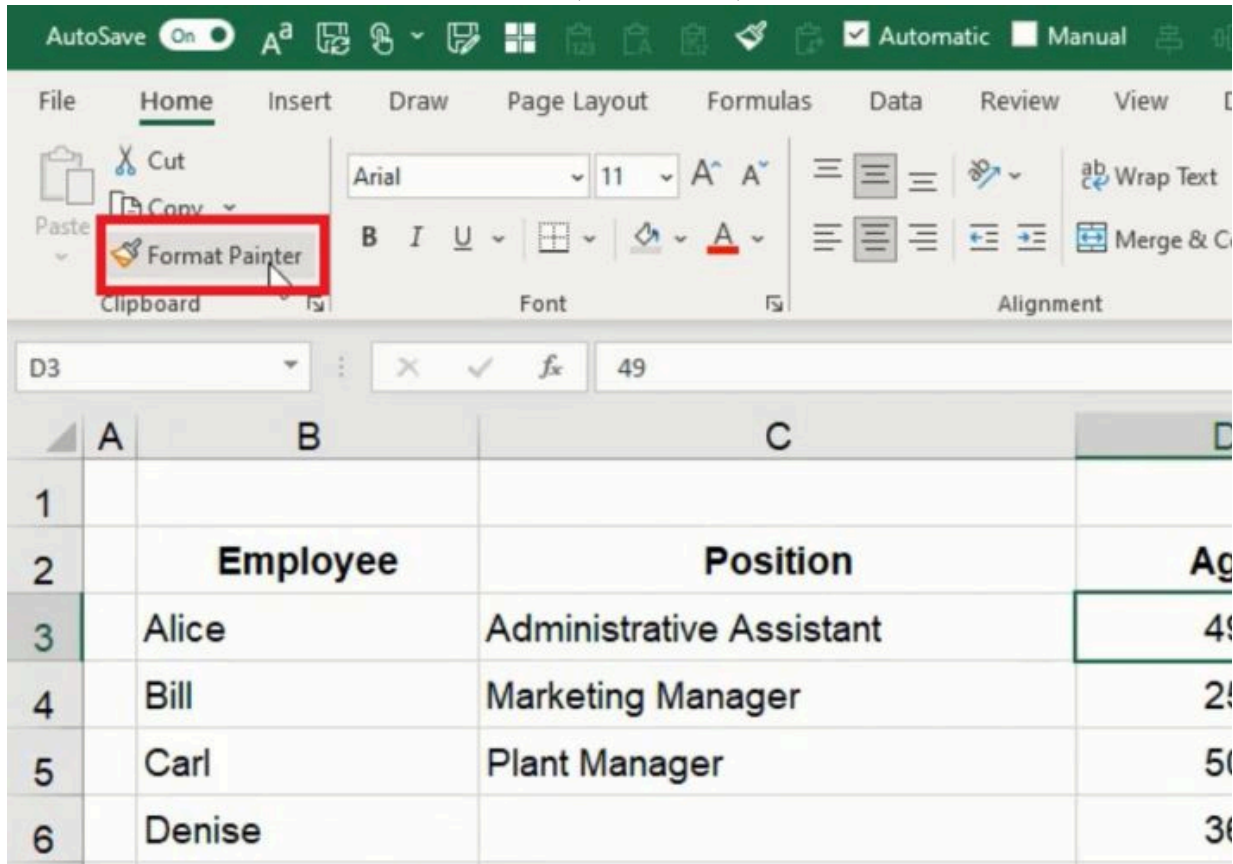2. Select the format painter on the upper left-hand side. (See **Figure 7.5**)

Figure 7.5

3. Drag your mouse over the new age, GPA, and salary. (See **Figure 7.6**)

		Age	College GPA	Salary
	Max	52	3.932	74000
	Min	24	2.306	22000
	3rd Largest	49	3.664	60000
	4th smallest	30	2.64	40000

Figure 7.6

a. This will automatically adjust the format to match that of the original reference. (See **Figure 7.7**)

G	H	I	J	K
		Age	College GPA	Salary
	Max	52	3.93	$74,000
	Min	24	2.31	$22,000
	3rd Largest	49	3.66	$60,000
	4th smallest	30	2.64	$40,000

Figure 7.7

Cell Referencing

One slight alteration we can do to our formulas to make them even more dynamic is that if we didn't want to be "hard-coding" or just typing in, for example, a three for "third largest" we can reference an additional cell.

1. Copy the cells with the =LARGE and =SMALL functions, and paste them below. (See **Figure 7.8**)

G	H	I	J	K	L
		Age	College GPA	Salary	
	Max	52	3.93	$74,000	
	Min	24	2.31	$22,000	
	3rd Largest	49	3.66	$60,000	
	4th smallest	30	2.64	$40,000	
	3rd Largest	45	3.65	$59,000	
	4th smallest	31	2.88	$46,000	

Figure 7.8

2. Notice that the pasted cells are now referencing the wrong set of cells.
3. Delete the incorrect information.
4. Off to the side, type a **3** beside the **3rd Largest** cell, and a **4** beside the **4th Smallest** cell.
5. Type **=LARGE** in the cell beside the *3rd Largest,* choose your array, (which is just all of the ages,) and then reference the **3** cell. (See **Figure 7.9**)
6. Hit **F4** to anchor the formula so that as you drag and copy it over, it won't move.
7. Repeat with the **=SMALL** function.
8. Drag over to the right, hover over the icon in the corner, and choose **Fill Without Formatting** to maintain the number formats it had previously.
    a. Now, if instead of the third-largest we'd like to see, for example, the fifth-largest, we can change the **3** to a **5**, and the referenced information will change along with it.
    b. Manually change the label to match, from third largest to fifth largest.

D	E	F	G	H	I	J	K	L
Age	**College GPA**	**Salary**			**Age**	**College GPA**	**Salary**	
49	3.92	$36,000		Max	52	3.93	$74,000	
25	2.55	$52,000		Min	24	2.31	$22,000	
50	3.57	$74,000		3rd Largest	49	3.66	$60,000	
36	2.64	$48,000		4th smallest	30	2.64	$40,000	
44	3.62	$62,000						
52	3.38	$59,000	3	3rd=LARGE(D3:D17,G8				
24	3.47	$48,000	4	4th s~~mallest~~ LARGE(array, k)				
31	2.88	$51,000						
45	2.88	$58,000						
30	3.93	$38,000						
37	2.31	$55,000						
24	3.66	$22,000						
31	3.65	$60,000						
40	2.34	$46,000						
48	3.33	$40,000						

Figure 7.9

Numbered List

We can also create a numbered list to rank the items from smallest to largest.

1. You can manually type and drag a list of, for example, 1–8, or you can use the fill series option as learned in a previous video.
2. Then, type **=LARGE**, select the array, and then anchor it, or make it an absolute reference, by pressing **F4**.
3. Then, for *k*, (which rank we want), we want the first largest, so you will select the number **1** from the list you previously created. (See **Figure 7.10**)

D	E	F	G	H		I	
Age	**College GPA**	**Salary**				**Age**	**Colleg**
49	3.92	$36,000		Max		52	3.
25	2.55	$52,000		Min		24	2.
50	3.57	$74,000		3rd Largest		49	3.
36	2.64	$48,000		4th smallest		30	2.
44	3.62	$62,000					
52	3.38	$59,000	5	5th Largest		45	3.
24	3.47	$48,000	4	4th smallest		30	2.
31	2.88	$51,000					
45	2.88	$58,000					
30	3.93	$38,000		1 =LARGE($D$3:$D$17,H12			
37	2.31	$55,000		2 LARGE(array, k)			
24	3.66	$22,000		3			
31	3.65	$60,000		4			
40	2.34	$46,000		5			
48	3.33	$40,000		6			
				7			
				8			

Figure 7.10

4. You can then drag it down, and because you have attached it to the proper references, it should fill in with the corresponding numbers.
5. Label the list with the word **Large**.

You'll notice that if you attempt to drag over the ages for the GPA and salary, it will give you an error. This has to do with the anchoring because rather than being referenced to the number *1*, *k* is now referenced to *52*.

To anchor just the cell, you will need to anchor to just the row, rather than the column and the row.

1. Change your formula so that only the row is being referenced. (See **Figures 7.11** and **7.12**)
   a. This makes it so that it won't move when you move cells down, but it will move columns to the right if dragged over.
2. Use the format painter to keep the data looking consistent.

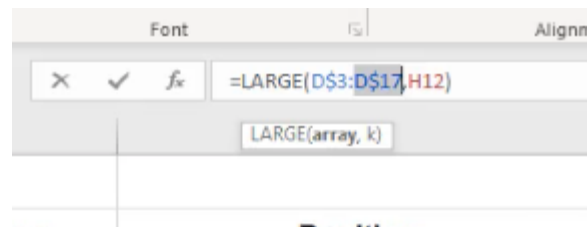You could do the same exercise with the small formula.

Figure 7.11

Figure 7.12

Rank Function

For our next example of ranking, let's say that instead of creating a list off to the side, we want to add a column into our data to give it a rank relative to the list and will rank every single item in the list.

1. Select columns **G** through **L**, right-click, and select **Insert**.
   a. This will shift all the formulas to the right so you don't lose them but have a space to work in.
2. Label columns for ranking each of the elements.
   a. The ampersand gives you the ability to combine terms.
      i. Type **="Rank "&**
   b. Select D2, the cell labeled **Age**
   c. Press **Enter**.
   d. Drag this cell over, and the information should fill in until all the columns are labeled properly.

RANK.AVG

If there's more than one age in the list that are the same and you choose RANK.AVG, the rank assigned to both of them will be the average of their rank.

1. Select the first cell under **Rank Age**, **G3**, and type **=RANK.AVG**.
2. Select the corresponding Age cell in the same row, D3, and type a comma after.
3. Select the entire Age array, and anchor just the rows.
4. Type a comma, and it will give you the option between descending or ascending. Choose descending (the largest number gets the highest rank).
5. Note that when the formula is complete, it will rank the age with a dollar sign. Update the format by selecting Number rather than Currency. Remove the decimals.
6. Drag this cell all the way down.
7. Drag that new array across.
   a. If your anchoring is set up correctly, each cell should correlate with the number in the same row in the assigned column of that information.
   b. If you expand the decimals, note that some ranks contain a .5 at the end. This is because the RANK.AVG formula is being used. It is averaging the two places to give you together and giving them the average of the two ranks.
      i. For example, the average of place *10* and place *11* would be *10.5*.

RANK.EQ

If you choose rank.eq, instead of averaging the two ranks that happen to be the same, it will take the highest of the two and it will assign that rank to both of them.

1. Copy the formulas from the rank titles by referencing them.
2. Add a note in the column above that says **AVG** for the averaged ranks, and **EQ** for the ones you are about to complete.
   a. Color code them using the fill colors.
3. Set up the rank formula again, but this time, choose RANK.EQ instead of RANK.AVG.
   a. Don't forget to anchor only the rows and not the columns.
4. Copy the cell over to the rest of the columns.
5. Copy these three cells down to the rest of the rows.
6. Change the formatting from **Currency** to **Numbers**.
   a. Notice that there's no .5 in the decimal places this time because the higher rank of the two that match is being used.
   b. For example, if two values at the *10* and *11* place were the same, they would both become *10.*

That's how the RANK function works, along with the MIN, MAX, LARGE, and SMALL functions.

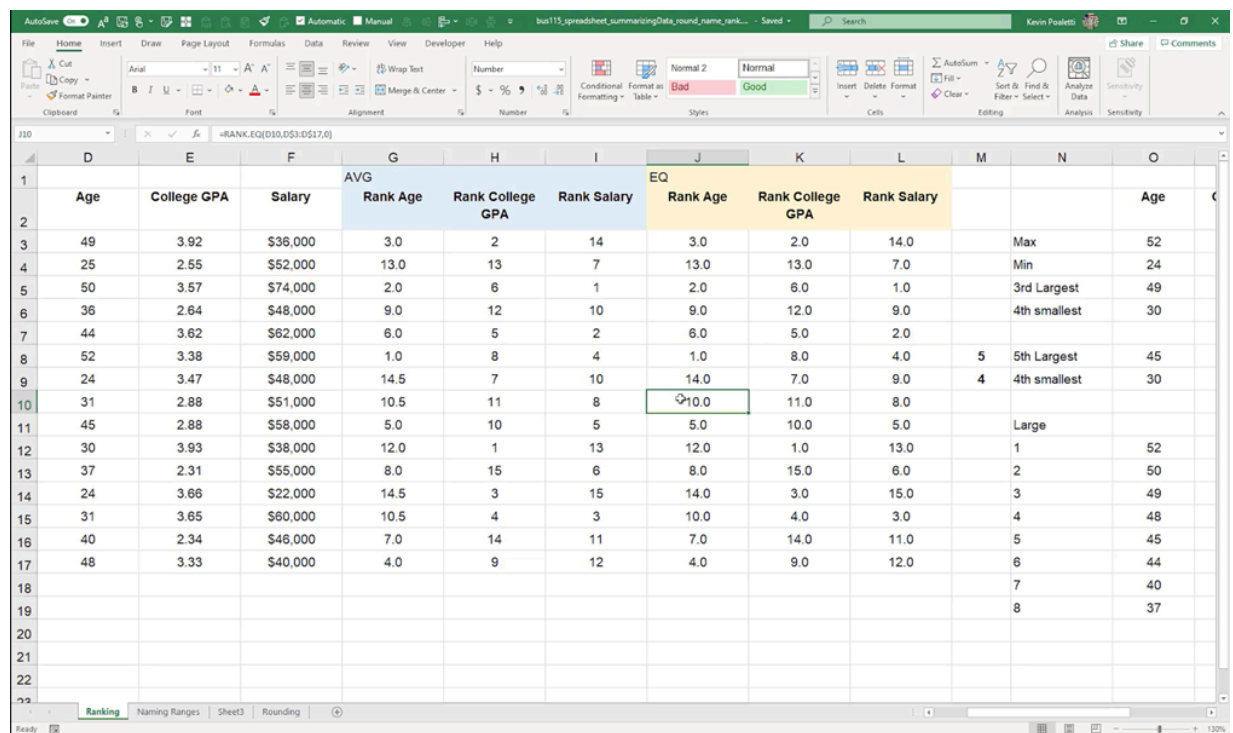When completed, your practice worksheet should look like the following:

Figure 7.13

Supplemental Resource