

How to Calculate the Average Excluding Highest and Lowest Values in Excel

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The Importance of Excluding Outliers in Data Analysis

In the field of professional **data analysis**, calculating a simple **average** is often insufficient for capturing the true essence of a dataset. When a set of numbers contains extreme values, commonly referred to as **outliers**, the resulting **arithmetic mean** can be misleadingly high or low. For instance, in competitive sports scoring or academic grading, the highest and lowest marks are frequently discarded to ensure that the final score reflects the consistent performance of the subject rather than an anomalous event. By learning how to refine your calculations in **Microsoft Excel**, you can produce more accurate and reliable reports that better represent the underlying **data distribution**.

The necessity of excluding the maximum and minimum values arises from the inherent sensitivity of the mean to extreme observations. While the **median** is naturally robust against such **outliers**, the mean is not. Therefore, applying a "trimmed" approach allows analysts to maintain the mathematical properties of the mean while stripping away the statistical "noise" generated by extreme data points. This technique is widely utilized in **economic indicators**, laboratory research, and financial forecasting where a single erratic data point could otherwise invalidate the entire conclusion of a study.

Fortunately, **Excel** provides several sophisticated methods to automate this process, ensuring that users do not have to manually identify and delete values. Utilizing functions like **TRIMMEAN** or a combination of **AVERAGEIFS**, **MAX**, and **MIN** allows for a dynamic calculation that updates automatically as your data changes. This guide will explore the most efficient ways to achieve this, focusing on precision, **formula syntax**, and practical application in real-world scenarios.

Utilizing the TRIMMEAN Function for Specialized Calculations

The primary tool for excluding a specific proportion of extreme values in **Excel** is the **TRIMMEAN** function. This specialized **statistical function** is designed to calculate the **mean** of the interior of a data set by removing a predetermined percentage of data points from the top and bottom tails. Unlike a standard **average**, which considers every value within a specified range, **TRIMMEAN** provides a structured way to "shave off" the ends of your data, making it an ideal choice for datasets where the sample size is large enough to warrant a percentage-based exclusion.

The **syntax** for this function is relatively straightforward: **TRIMMEAN(array, percent)**. The first **argument**, "array," refers to the range of cells containing the numbers you wish to analyze. The second **argument**, "percent," is the fractional number of data points to exclude from the calculation. It is important to note that **TRIMMEAN** rounds the number of excluded data points down to the nearest multiple of 2. This ensures that an equal number of values are removed from both the top and the bottom of the set, preserving the balance of the remaining **data points**.

One of the most powerful aspects of the **TRIMMEAN** function is its flexibility. While many users use it to exclude a fixed percentage, such as 10% or 20%, it can also be adapted to exclude exactly one highest and one lowest value regardless of the dataset's size. By integrating the **COUNT** function into the percentage **argument**, you can create a dynamic formula that scales with your data. This prevents the need for manual adjustments every time a new row is added to your **spreadsheet**, thereby reducing the risk of human error in your **financial modeling** or research tasks.

A Practical Walkthrough of the TRIMMEAN Formula

To calculate the **average** of a range while specifically targeting and removing the single highest and single lowest values, you can use a formula that combines **TRIMMEAN** with the **COUNT** function. The logic involves telling **Excel** to exclude exactly two values from the total count. Specifically, you would use the following **formula** structure:

```
=TRIMMEAN(A2:A11,2/COUNT(A2:A11))
```

In this specific calculation, the **TRIMMEAN** function looks at the range **A2:A11**. The second part of the formula, **2/COUNT(A2:A11)**, calculates what percentage of the total count is represented by two units. By providing this percentage to the function, **Excel** understands that it must remove one value from the top and one value from the bottom. This is a highly efficient way to handle **outliers** without needing complex logic or **conditional formatting**.

Once the highest and lowest values are identified and discarded by the function, **TRIMMEAN** proceeds to calculate the **arithmetic mean** of the remaining values. This provides a "cleaner" result that is more representative of the core dataset. This method is particularly useful in business environments where sales data or performance metrics might have occasional anomalies that do not reflect the standard operating reality.

Step-by-Step Example in a Real Spreadsheet

Consider a scenario where you have a list of ten values in an **Excel** worksheet. These values represent various measurements that you need to **average**. However, the first and last measurements in terms of magnitude seem like potential **outliers**. To ensure your **data analysis** is sound, you decide to exclude them. The following image represents the initial state of your data:

	A	B	C	D	E
1	Values				
2	14				
3	19				
4	22				
5	24				
6	30				
7	44				
8	28				
9	17				
10	14				
11	10				
12					
13					
14					
15					

To perform the calculation, you select a target cell, such as **C2**, and input the formula discussed previously. This formula will scan the range **A2:A11**, determine that there are 10 values, and then exclude the top and bottom 10% (which equals 2 total values). The execution of this **formula** within the **Excel** environment is displayed below:

=TRIMMEAN(A2:A11,2/COUNT(A2:A11))

As illustrated in the screenshot, the result of the calculation is **21**. This number represents the **average** of the middle eight values after the extreme **outliers** have been removed. This automated approach is much faster than manually sorting the data and using a standard **average** function on a subset of the cells.

	A	B	C	D
1	Values		Avg. Excluding High and Low Values	
2	14		21	
3	19			
4	22			
5	24			
6	30			
7	44			
8	28			
9	17			
10	14			
11	10			
12				
13				
14				
15				

Verifying the Accuracy of the Formula Results

To verify that the **TRIMMEAN** function is operating as expected, we can perform a manual check of the data. In our example range of **A2:A11**, the values provided were 10, 14, 19, 22, 24, 30, 28, 17, 14, and 44. By inspecting this list, we can clearly identify that **10** is the minimum value and **44** is the maximum value. These are the two **data points** that our **formula** is designed to ignore.

	A	B	C	D
1	Values		Avg. Excluding High and Low Values	
2	14		21	
3	19			
4	22			
5	24			
6	30			
7	44 Highest			
8	28			
9	17			
10	14			
11	10 Lowest			
12				
13				
14				
15				
16				
17				
18				

After removing 10 and 44 from the set, the remaining values are 14, 19, 22, 24, 30, 28, 17, and 14. If we manually sum these numbers, we get a total of 168. Dividing this sum by the number of remaining values (8) gives us exactly 21. This confirms that the **TRIMMEAN** function correctly isolated the extremes and calculated the **mean** of the central values.

This verification process is a critical step in **data validation**. It ensures that the **logic** applied in your **Excel** formulas matches your intended statistical goals. Once you are confident in the formula's performance, you can apply it to much larger datasets where manual verification would be impossible, trusting that **Excel** will consistently apply the same rigorous **algorithm** to your figures.

Deep Dive into the Formula Logic and Scalability

The elegance of the formula **=TRIMMEAN(A2:A11, 2/COUNT(A2:A11))** lies in its mathematical **scalability**. The "percent" **argument** in the **TRIMMEAN** function dictates how many points are removed. Because the function always removes an equal number of values from both ends, dividing "2" by the total count of numbers in the range ensures that exactly one value is trimmed from the top and one from the bottom, regardless of whether you have 10, 100, or 1,000 entries.

For instance, if your dataset expanded to 20 values (range A2:A21), the calculation within the **argument** would become **2/20**, which is 0.10 or 10%. **TRIMMEAN** would then calculate 10% of 20,

which is 2. It would then remove the lowest 5% (one value) and the highest 5% (one value). This consistency makes the formula a robust **template** for any **spreadsheet** requiring the exclusion of single-point extremes. It effectively transforms a static **statistical function** into a dynamic tool for **data processing**.

Furthermore, this approach avoids the pitfalls of more complex **array formulas** or **VBA** scripts. It utilizes native **Excel** functions that are highly optimized for performance. Whether you are working on a small project or a massive **database**, the **TRIMMEAN** method remains one of the most efficient ways to handle **outlier** removal while maintaining the integrity of your **average** calculation.

Alternative Methods: Using AVERAGEIFS, MAX, and MIN

While **TRIMMEAN** is the most direct method, there is an alternative approach using the **AVERAGEIFS** function. This method is sometimes preferred by users who want more explicit control over the exclusion criteria. By using **AVERAGEIFS**, you can define multiple conditions that a number must meet to be included in the **average**. To exclude the highest and lowest values, you would set criteria that exclude any value equal to the **MAX** or **MIN** of the range.

An example of this alternative **formula** would look like this: **=AVERAGEIFS(A2:A11, A2:A11, ">"&MIN(A2:A11), A2:A11, "<"&MAX(A2:A11))**. This logic tells **Excel** to only average cells in the range **A2:A11** if they are strictly greater than the minimum value and strictly less than the maximum value. This is a very transparent way to build a formula, as each part of the condition is clearly visible to anyone auditing the **spreadsheet**.

However, there is a significant difference between this method and **TRIMMEAN**. If your dataset contains multiple instances of the same maximum or minimum value (e.g., two people tied for the lowest score of 10), the **AVERAGEIFS** formula will exclude *all* instances of that value. In contrast, **TRIMMEAN** will only exclude one instance from each end if the percentage **argument** is set correctly. Depending on your **data analysis** requirements, one method may be more appropriate than the other, though **TRIMMEAN** is generally the standard for "trimmed" averages in **statistics**.

Best Practices for Data Integrity in Excel

When performing any advanced **data analysis** in **Excel**, it is vital to follow best practices to ensure your results are accurate. First, always ensure that your data range does not contain hidden **strings** or text formatted as numbers, as this can cause functions like **COUNT** or **TRIMMEAN** to return errors or incorrect results. Using **data validation** tools to restrict input to numeric values can help maintain a clean **database** environment.

Second, consider the impact of empty cells. Most **Excel** **statistical functions**, including

AVERAGE and **TRIMMEAN**, automatically ignore empty cells. However, they do not ignore cells containing the number zero. If a zero is a valid data point, it will be included in the calculation and could potentially be identified as the "minimum" value to be excluded. If a zero represents missing data, it should be removed or handled using **IFERROR** logic to prevent it from skewing your **average**.

Finally, always document your formulas and the logic behind your **outlier** exclusion. If you are sharing your **workbook** with colleagues, a brief note explaining why you chose to use **TRIMMEAN** or **AVERAGEIFS** will help them understand the **methodology**. This transparency is key to professional **reporting** and ensures that your **data analysis** can be replicated and verified by others in your organization.

Further Learning and Excel Resources

Mastering the **average** function variants is just the beginning of what you can achieve with **Microsoft Excel**. The ability to manipulate **data points** and apply conditional logic is a core skill for anyone working in **finance**, **engineering**, or **business intelligence**. By understanding the nuances of functions like **TRIMMEAN**, you move beyond basic **spreadsheet** usage and into the realm of sophisticated **data science**.

If you are interested in expanding your skills further, there are numerous tutorials available that cover related topics. You might want to explore how to calculate **weighted averages**, how to use **pivot tables** for advanced **data aggregation**, or how to create **dynamic charts** that update based on your trimmed calculations. Each new function you master adds another tool to your analytical arsenal, allowing you to derive deeper insights from your data.

The following tutorials and **official documentation** explain how to perform other common operations in **Excel**, helping you to refine your workflows and increase your productivity. Whether you are a beginner or an advanced user, staying updated with the latest **software** features and **statistical methods** is essential for excellence in the digital workplace.