

How to Calculate the Average After Removing the Lowest Value in Excel

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The Importance of Precision in Statistical Computation using Microsoft Excel

In the contemporary landscape of **data analysis**, maintaining the integrity of statistical results is paramount for researchers, educators, and business professionals alike. Microsoft Excel remains the industry standard for managing large datasets, offering a robust suite of functions designed to extract meaningful insights from raw numbers. One common challenge in **statistical analysis** is the need to calculate a more representative arithmetic mean by excluding extreme values or anomalies that might skew the overall result. This process, often referred to as trimming or dropping an **outlier**, ensures that the final calculated average reflects the central tendency of the data more accurately without being disproportionately influenced by a single low performance or technical error.

To calculate the average and drop the lowest value from a set of data in Microsoft Excel, users can leverage a combination of the AVERAGE function and the SMALL function, or more effectively, a composite formula involving SUM, **SMALL**, and COUNT. The initial step involves identifying the specific range of data from which the average must be derived. Once the range is established, the user must implement logic that first aggregates the total value of the set and then identifies the minimum entry to be removed. By subtracting the smallest value from the total sum and dividing the remaining total by the adjusted count of items, the resulting figure represents a refined average that excludes the lowest data point.

This sophisticated method of data analysis eliminates the need for manual calculations, which are often prone to human error and inconsistency. In professional settings, such as academic grading or performance reviews, accuracy is non-negotiable. By automating the exclusion of the lowest value, analysts can ensure that their results are reproducible and based on sound mathematical principles. Utilizing these advanced features of Microsoft Excel allows for deeper exploration of datasets and provides a more nuanced understanding of performance metrics across various applications.

Excel: Calculate Average and Drop Lowest Value

Implementing the Formula for Adjusted Averages

In many analytical scenarios, you may find it necessary to calculate the **arithmetic mean** of a specific range while intentionally omitting the lowest entry. This is particularly useful in scoring systems where a participant's worst performance is disregarded to provide a fairer assessment of their overall capability. To achieve this in Microsoft Excel, you can utilize a specialized formula that combines several arithmetic operations into a single, efficient string:

`=(SUM(B2:E2)-SMALL(B2:E2,1))/(COUNT(B2:E2)-1)`

This specific formula is designed to target a horizontal range of cells, such as **B2:E2**, and perform a multi-step calculation. First, it identifies the total sum of all values within that range. Second, it utilizes the **SMALL function** to locate the single lowest value. By subtracting this minimum value from the total sum, the formula isolates the remaining scores. Finally, it divides this adjusted sum by the total count of cells in the range minus one, effectively yielding the average of the remaining data points.

The efficiency of this approach lies in its dynamic nature. Whether your data consists of four columns or four hundred, the logic remains consistent. The following practical example illustrates how this formula can be applied to a real-world grading dataset to automate the calculation of final student scores.

Practical Example: Calculating Academic Grades with Score Exclusions

Consider a scenario involving a classroom spreadsheet that tracks the performance of students across a series of midterm examinations. In this dataset, we have multiple students, each with four distinct scores recorded in separate columns. The goal is to determine a final grade that reflects each student's best three performances, effectively dropping their lowest exam score.

	A	B	C	D	E	F
1	Student	Midterm 1	Midterm 2	Midterm 3	Midterm 4	
2	Andy	90	90	74	84	
3	Bob	92	84	91	71	
4	Chad	87	82	99	84	
5	Doug	75	78	67	90	
6	Eric	68	90	65	76	
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						

In the provided image, we see that student scores are distributed across columns B, C, D, and E. An instructor might decide that the final grade should be the **arithmetic mean** of the three highest scores. Manually identifying the lowest score for every student in a large class would be a tedious

and error-prone task. However, by applying the formula in Microsoft Excel, the process becomes instantaneous and perfectly accurate.

To begin the calculation for the first student, you would navigate to cell **F2** and input the following formula to drop the lowest midterm grade and calculate the adjusted average:

`=(SUM(B2:E2)-SMALL(B2:E2,1))/(COUNT(B2:E2)-1)`

After entering the formula into the initial cell, you can utilize the **Fill Handle** feature in Excel to apply the logic to the rest of the class. By clicking and dragging the corner of cell F2 down through the remaining rows in column F, the software automatically updates the cell references for each student, ensuring that every individual's lowest score is uniquely identified and excluded from their specific average.

F2 <i>fx</i> <code>=(SUM(B2:E2)-SMALL(B2:E2,1))/(COUNT(B2:E2)-1)</code>						
	A	B	C	D	E	F
1	Student	Midterm 1	Midterm 2	Midterm 3	Midterm 4	Average Without Lowest Score
2	Andy	90	90	74	84	88
3	Bob	92	84	91	71	89
4	Chad	87	82	99	84	90
5	Doug	75	78	67	90	81
6	Eric	68	90	65	76	78
7						
8						
9						
10						
11						
12						

Upon completion, column F will reflect the revised averages. This ensures that a single bad day or an outlier performance does not unfairly penalize a student's overall grade, providing a more comprehensive view of their academic success throughout the semester.

To better understand the outcome, let us examine specific cases from the dataset:

Andy's lowest midterm score was a **74**. When this value is excluded, his average is determined by the three remaining scores (90, 90, and 84). The calculation becomes $(90 + 90 + 84) / 3$, resulting in a final average of **88**.

Bob's lowest midterm score was a **71**. After dropping this value, his final grade is calculated using the scores 92, 84, and 91. The resulting math $(92 + 84 + 91) / 3$ yields a final average of **89**.

This systematic process is applied uniformly across the entire dataset, maintaining consistency and transparency in the grading process.

Deconstructing the Mathematical Mechanics of the Formula

To truly master data analysis in Excel, it is helpful to understand the underlying mechanics of the formula we used. The strength of this approach is how it links three distinct functions to perform a complex task. Recall the formula:

`=(SUM(B2:E2)-SMALL(B2:E2,1))/(COUNT(B2:E2)-1)`

Each component of this string serves a specific mathematical purpose:

The **SMALL function** is the primary investigative tool in this formula. It is configured to look at the range **B2:E2** and identify the "k-th" smallest value. By setting the second argument to **1**, we instruct Excel to find the absolute minimum value in the set. If we wanted to drop the two lowest values, we would need a more complex subtraction involving both the 1st and 2nd smallest values.

The SUM function acts as the initial aggregator. It adds every number in the range together without discrimination. By placing the subtraction operator between **SUM** and **SMALL**, we are effectively telling Excel to take the total "pot" of points and remove the single smallest "contribution" from that pot. This leaves us with the total points earned in all but the worst exam.

Finally, the COUNT function determines the denominator for our average. A standard average is the sum divided by the number of items. Since we have intentionally removed one item from the sum, we must also remove one item from the count. The expression **(COUNT(B2:E2)-1)** ensures that we are dividing by the correct number of remaining exams, preventing the average from being artificially lowered by a mismatched denominator.

Advanced Data Management and Scalability

While the student grade example is a classic use case, the ability to calculate an adjusted **arithmetic mean** is vital in many professional fields. In finance, for instance, analysts might drop the lowest monthly return of a volatile asset to better understand its consistent performance. In sports analytics, a coach might drop a player's worst game stats to evaluate their typical contribution to the team. The scalability of the **SUM-SMALL-COUNT** method makes it an essential tool for any data analysis workflow.

Furthermore, this formula can be adapted to handle larger datasets or different exclusion criteria. For example, if a dataset contains ten exams and the instructor wishes to drop the two lowest scores, the formula would be modified to subtract both the 1st and 2nd smallest values, and the

denominator would be adjusted to **(COUNT(B2:K2)-2)**. This flexibility is what makes Microsoft Excel such a versatile environment for **statistical analysis** and reporting.

It is also important to consider how the formula handles ties. If a student receives the same lowest score on two different exams (e.g., two scores of 70), the SMALL function will identify 70 as the minimum, and only one instance of that 70 will be subtracted. This maintains the integrity of the calculation, as the goal is to drop a single "lowest" event, regardless of whether that specific score was repeated.

Conclusion and Best Practices for Spreadsheet Analysis

Mastering the use of combined functions in Microsoft Excel is a significant step toward becoming a proficient data analyst. By understanding how to calculate averages while excluding an **outlier** or minimum value, you gain the ability to provide more accurate and fair representations of data trends. This technique is a cornerstone of professional data analysis, ensuring that results are not skewed by anomalous or irrelevant data points.

When working with these formulas, always ensure that your ranges are correctly defined and that your data types are consistent. For instance, the COUNT function only tallies cells containing numbers, so if there are text entries or empty cells within your range, the formula may return unexpected results. Double-checking your data entry is a best practice that complements the power of Excel's computational capabilities.

The following tutorials explain how to perform other common tasks in Excel:

How to Calculate a Weighted Average in Excel

Using the AVERAGEIF Function for Conditional Means

Identifying Outliers Using Standard Deviation

Advanced Data Visualization Techniques