

# Understanding and Calculating Deciles in Google Sheets: A Step-by-Step Guide

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## The Role of Deciles in Statistical Data Distribution

In the complex field of [statistics](#) and [data analysis](#), achieving a deep understanding of the [data distribution](#) within a [dataset](#) is essential for deriving meaningful conclusions. Deciles serve as foundational tools for this purpose. Deciles are specific values that systematically divide an ordered dataset into ten equally sized parts, meaning each segment encompasses exactly 10% of the total observations. As a specialized type of [quantile](#)--alongside more commonly known measures like quartiles (four parts) and [percentiles](#) (one hundred parts)--deciles provide a highly granular view of how values are spread.

The primary analytical function of deciles is to establish thresholds that indicate the value below which a specific cumulative percentage of observations falls. For instance, the **First Decile** (D1) marks the boundary below which the lowest 10% of the data values are found. Following this pattern, the **Second Decile** (D2) indicates the point where 20% of the data lies below it, and this segmentation continues sequentially up to the **Ninth Decile** (D9), which represents the value threshold for the bottom 90% of the dataset. The tenth decile (D10) is, by definition, equivalent to the maximum value of the dataset.

Decile analysis provides crucial insights into the overall shape, [skewness](#), and spread of the data. By examining the distance between deciles, analysts can quickly determine where the majority of the data clusters and identify potential [outliers](#) or significant shifts in value density. For example, calculating the range between the first and ninth deciles instantly reveals the central 80% of the data, effectively excluding the most extreme 10% on both the low and high ends, thus offering a robust measure of central tendency spread.

## Leveraging the PERCENTILE Function in Google Sheets

When data manipulation takes place within a spreadsheet environment, such as [Google Sheets](#), the calculation of deciles becomes remarkably efficient. Google Sheets incorporates a powerful native [function](#), known as **PERCENTILE**, which is specifically designed to calculate the value corresponding to a designated [percentile](#) rank within any given array of data. Since deciles are fundamentally defined as specific percentiles--the first decile being the 10th percentile, the second the 20th, and so on--this function is the perfect tool for our statistical analysis needs.

The [syntax](#) required for the **PERCENTILE** function is both straightforward and highly intuitive, making it easily adoptable for users of all skill levels:

**=PERCENTILE(CELL RANGE, PERCENTILE)**

To properly utilize this statistical tool, it is essential to understand the two core arguments required:

**CELL RANGE:** This argument mandates the specification of the contiguous range of cells (e.g., `A1:A50`, `B2:B100`) that contains the numerical [dataset](#) for which the decile calculation is to be performed.

**PERCENTILE:** This must be a decimal numerical value falling between 0 and 1, inclusive, representing the fractional rank of the desired percentile. To calculate the nine principal deciles, one must input values ranging from 0.1 (for the 1st decile/10th percentile), 0.2 (for the 2nd decile/20th percentile), and progressively increasing steps up to 0.9 (for the 9th decile/90th percentile).

For example, if an analyst intends to isolate the value corresponding to the **third decile** (D3) within a data array spanning cells `A1` through `A50` in [Google Sheets](#), the correct and necessary formula to be entered into a separate cell is structured as follows:

**=PERCENTILE(A1:A50, 0.3)**

Execution of this formula will reliably return the precise numerical value below which 30% of the entire data population within the specified range resides, defining the third decile threshold.

## Step-by-Step Calculation and Interpretation of Decile Values

To fully solidify the methodology, let us examine a concrete, practical application of the **PERCENTILE** function. Imagine we are working with a [dataset](#) composed of 20 distinct numerical observations--perhaps representing student test scores, monthly sales figures, or scientific measurements. Our explicit objective is to calculate and understand the significance of all nine deciles (D1 through D9) for this particular sample.

The initial step involves organizing the raw data. Consider the following array of values, typically arranged in a single column within your spreadsheet:

|    | A                 | B | C | D |  |
|----|-------------------|---|---|---|--|
| 1  | <b>Data Value</b> |   |   |   |  |
| 2  | 56                |   |   |   |  |
| 3  | 58                |   |   |   |  |
| 4  | 64                |   |   |   |  |
| 5  | 67                |   |   |   |  |
| 6  | 68                |   |   |   |  |
| 7  | 73                |   |   |   |  |
| 8  | 78                |   |   |   |  |
| 9  | 83                |   |   |   |  |
| 10 | 84                |   |   |   |  |
| 11 | 88                |   |   |   |  |
| 12 | 89                |   |   |   |  |
| 13 | 90                |   |   |   |  |
| 14 | 91                |   |   |   |  |
| 15 | 92                |   |   |   |  |
| 16 | 93                |   |   |   |  |
| 17 | 93                |   |   |   |  |
| 18 | 94                |   |   |   |  |
| 19 | 95                |   |   |   |  |
| 20 | 97                |   |   |   |  |
| 21 | 99                |   |   |   |  |
| 22 |                   |   |   |   |  |

Once the data is situated (for example, in column A), we proceed to systematically calculate each decile. This requires applying the **PERCENTILE** [function](#) nine times, adjusting the percentile argument (0.1, 0.2, 0.3, ..., 0.9) for each calculation. The subsequent illustration demonstrates the practical setup within [Google Sheets](#), clearly showing the formulas used in column B and the resulting decile values generated:

|    |                                     |                                    |        |       |   |
|----|-------------------------------------|------------------------------------|--------|-------|---|
| D2 | <div><div></div><div>fx</div></div> | =PERCENTILE(\$A\$2:\$A\$21, C2/10) |        |       |   |
|    | A                                   | B                                  | C      | D     | E |
| 1  | Data Value                          |                                    | Decile | Value |   |
| 2  | 56                                  |                                    | 1      | 63.4  |   |
| 3  | 58                                  |                                    | 2      | 67.8  |   |
| 4  | 64                                  |                                    | 3      | 76.5  |   |
| 5  | 67                                  |                                    | 4      | 83.6  |   |
| 6  | 68                                  |                                    | 5      | 88.5  |   |
| 7  | 73                                  |                                    | 6      | 90.4  |   |
| 8  | 78                                  |                                    | 7      | 92.3  |   |
| 9  | 83                                  |                                    | 8      | 93.2  |   |
| 10 | 84                                  |                                    | 9      | 95.2  |   |
| 11 | 88                                  |                                    |        |       |   |
| 12 | 89                                  |                                    |        |       |   |
| 13 | 90                                  |                                    |        |       |   |
| 14 | 91                                  |                                    |        |       |   |
| 15 | 92                                  |                                    |        |       |   |
| 16 | 93                                  |                                    |        |       |   |
| 17 | 93                                  |                                    |        |       |   |
| 18 | 94                                  |                                    |        |       |   |
| 19 | 95                                  |                                    |        |       |   |
| 20 | 97                                  |                                    |        |       |   |
| 21 | 99                                  |                                    |        |       |   |
| 22 |                                     |                                    |        |       |   |
| 23 |                                     |                                    |        |       |   |

Each numerical result derived from this process represents a significant threshold within the data distribution. Interpreting these values is crucial for drawing accurate statistical conclusions:

The calculated First Decile (D1) is **63.4**. This precise value means that 10% of all recorded data points in this dataset are equal to or less than 63.4.

The Second Decile (D2) yields **67.8**. Consequently, this demonstrates that 20% of the entire data population falls at or below this specific numerical point.

The Third Decile (D3) is determined to be **76.5**. This signifies a cumulative percentage, meaning 30% of all observations are numerically less than or equivalent to 76.5.

Such quantitative thresholds allow for rapid performance assessment. If, hypothetically, these values represented competitive scores, achieving a score above the D9 threshold would immediately classify that performance within the top 10% of the entire cohort, providing clear benchmarking.

## Determining Decile Rank with the PERCENTRANK.EXC Function

While calculating the decile thresholds (D1 through D9) is highly informative, analysts often require a method to classify where an individual data point stands relative to the entire distribution. This requires determining the percentile rank of a specific observation, which in turn allows for its assignment into the correct decile interval. For this inverse calculation, [Google Sheets](#) offers the equally powerful function: **PERCENTRANK.EXC**.

The **PERCENTRANK.EXC** [function](#) computes the rank of a specified value as a percentage of the dataset, specifically excluding the lowest and highest boundary values from the percentile calculation (hence the "EXC" moniker). This exclusive method is often preferred for rigorous statistical classification, as it precisely determines the percentile into which any given observation falls.

Understanding the required [syntax](#) is key to utilizing this tool effectively:

**=PERCENTRANK.EXC(CELL RANGE, DATA VALUE, SIGNIFICANCE)**

Here is a detailed breakdown of the arguments necessary for accurate ranking:

**CELL RANGE:** This argument defines the array containing all the numerical data points (e.g., `A1:A20`). It must be a single-dimension array (column or row).

**DATA VALUE:** This specifies the exact numerical point, either contained within the dataset or external to it, for which the corresponding percentile rank is sought.

**SIGNIFICANCE** (Optional): This parameter dictates the number of decimal places or significant digits used to express the resulting percentile rank. When categorizing observations into deciles, setting the significance to one digit often suffices, as it clearly aligns the rank with the 0.1, 0.2, 0.3 decile boundaries.

In essence, **PERCENTRANK.EXC** calculates what percentage of the values in the specified range are strictly less than the chosen data value. This percentile output, expressed as a decimal between 0 and 1, is then interpreted directly to place the observation into its corresponding decile category.

## Applying PERCENTRANK.EXC to Categorize Data Points

Continuing with our established [dataset](#) of 20 numerical values, let us now demonstrate how the **PERCENTRANK.EXC** function is practically applied to assign a relative rank to every single data point. We will utilize the original data located in column A and input the ranking [function](#) into an adjacent column to derive the percentile rank for each score individually.

The visual representation below illustrates the implementation of this function within [Google Sheets](#). Note the specific inclusion of the optional `SIGNIFICANCE` argument in the formula, which is used to ensure the output precision facilitates straightforward categorization into 10% intervals, simplifying the assignment of decile categories:

| B2 |            | <i>fx</i> | =PERCENTRANK.EXC(\$A\$2:\$A\$21, A2, 1) |   |   |
|----|------------|-----------|-----------------------------------------|---|---|
|    | A          | B         | C                                       | D | E |
| 1  | Data Value | Decile    |                                         |   |   |
| 2  | 56         | 0         |                                         |   |   |
| 3  | 58         | 0.1       |                                         |   |   |
| 4  | 64         | 0.1       |                                         |   |   |
| 5  | 67         | 0.2       |                                         |   |   |
| 6  | 68         | 0.2       |                                         |   |   |
| 7  | 73         | 0.3       |                                         |   |   |
| 8  | 78         | 0.3       |                                         |   |   |
| 9  | 83         | 0.4       |                                         |   |   |
| 10 | 84         | 0.4       |                                         |   |   |
| 11 | 88         | 0.5       |                                         |   |   |
| 12 | 89         | 0.5       |                                         |   |   |
| 13 | 90         | 0.6       |                                         |   |   |
| 14 | 91         | 0.6       |                                         |   |   |
| 15 | 92         | 0.7       |                                         |   |   |
| 16 | 93         | 0.7       |                                         |   |   |
| 17 | 93         | 0.7       |                                         |   |   |
| 18 | 94         | 0.8       |                                         |   |   |
| 19 | 95         | 0.9       |                                         |   |   |
| 20 | 97         | 0.9       |                                         |   |   |
| 21 | 99         | 1         |                                         |   |   |
| 22 |            |           |                                         |   |   |

The resulting output generated by **PERCENTRANK.EXC** is a decimal representing the normalized rank of the value (0 to 1). This rank is the direct indicator needed to classify the data point into the correct decile:

If an observation's percentile rank falls between 0.0 (exclusive) and 0.1 (inclusive), that data point is categorized within the **First Decile**. For instance, the data value of **58** produces a rank in this range.

If the computed rank is between 0.1 (exclusive) and 0.2 (inclusive), the value belongs to the **Second Decile**. Examples include data values such as **64** and **67**, which both fall within this specific 10% segment.

If the rank is between 0.2 (exclusive) and 0.3 (inclusive), the data point is placed in the **Third Decile**. The observation of **68** serves as a clear example of a value categorized within this decile interval.

This systematic categorization continues throughout the range, with each of the nine deciles occupying a distinct 0.1 fractional interval of the total percentile rank scale.

Through the systematic application and accurate interpretation of the **PERCENTRANK.EXC** function, analysts can effectively segment large datasets, gaining an immediate understanding of the relative standing and performance of any individual data point compared to its peers.

## Broad Applications and Strategic Insights Provided by Decile Analysis

Deciles transcend mere statistical computation; they function as robust analytical instruments with widespread applicability across diverse professional domains. They offer immediate, actionable insights into performance metrics, distribution fairness, and overall data structure, guiding strategic decision-making and highlighting key areas for intervention or investment.

A prominent application resides in **economic analysis**, where deciles are routinely used to scrutinize the distribution of income or wealth across a population. By comparing metrics like the average income of the lowest decile against that of the highest decile, researchers can quantify economic inequality, providing data necessary to formulate targeted social or fiscal policies. Similarly, in the field of **education**, deciles are invaluable for cohort analysis; they allow administrators to quickly identify students performing in the top 10% or the bottom 10% of their peers, enabling the implementation of specialized support programs or advanced curriculum enrichment.

In the commercial sector, particularly **business intelligence and marketing**, decile segmentation is critical for customer relationship management. Businesses frequently segment their customer base using deciles based on metrics like total lifetime spending, purchase frequency, or product engagement levels. This segmentation allows for highly differentiated marketing strategies: high-value customers in the top deciles might receive exclusive loyalty incentives, while those in the lowest deciles might be targeted with re-engagement campaigns. Furthermore, in **financial analysis**, deciles can classify the performance of investment portfolios or individual assets, helping investors contextualize risk and reward relative to broader market benchmarks or peer investment groups.

Ultimately, decile analysis simplifies inherently complex data by segmenting it into ten distinct, manageable, and highly interpretable groups. They establish a clear framework for rigorous comparison, allowing analysts to benchmark individual achievements against the collective group, identify significant underlying trends, and make evidence-based decisions driven by the relative standing of observations. The seamless integration and straightforward calculation of these



measures within spreadsheet tools like [Google Sheets](#) democratize advanced data insight for a wide array of users.

## **Further Resources for Advanced Spreadsheet Analysis**

To continue developing proficiency in data analysis and statistical functions within [Google Sheets](#), we encourage exploration of additional tutorials covering other essential and frequently used analytical functions: