

How to Calculate a Five Number Summary in SPSS: A Step-by-Step Guide

Authored by
stats writer

March 15, 2026

RECOMMENDED CITATION

stats writer (2026). *How to Calculate a Five Number Summary in SPSS: A Step-by-Step Guide*. PSYCHOLOGICAL SCALES. Retrieved from <https://scales.arabpsychology.com/?p=136011>

Calculate a Five Number Summary in SPSS

In the field of **statistics**, the ability to condense a large volume of data into a manageable and interpretable format is essential for any researcher. One of the most effective methods for achieving this is the **five-number summary**. This summary provides a snapshot of a **dataset** by highlighting five specific values that describe its center, spread, and range. By utilizing **descriptive statistics**, analysts can quickly identify patterns, detect skewness, and prepare data for further complex modeling. The five-number summary is a foundational pillar of **exploratory data analysis**, originally popularized by the mathematician John Tukey.

The **five-number summary** consists of the following critical values:

The **minimum**: The lowest value present in the observation set.

The **first quartile** (Q1): The value below which 25% of the data falls.

The **median**: The central value that splits the data into two equal halves.

The **third quartile** (Q3): The value below which 75% of the data falls.

The **maximum**: The highest value observed within the dataset.

Generating this summary is a vital step because it offers a multidimensional view of the data distribution. For instance, the **median** serves as a robust measure of central tendency, often preferred over the mean when dealing with skewed distributions or **outliers**. The distance between the first and third **quartiles**, known as the **interquartile range** (IQR), provides insight into the variability of the middle 50% of the observations. Finally, the **minimum** and **maximum** define the absolute boundaries of the data, allowing researchers to calculate the total range and identify potential data entry errors or extreme values.

This comprehensive tutorial is designed to guide you through the process of calculating a **five-number summary** using **SPSS** (Statistical Package for the Social Sciences). As one of the most widely used software tools in social science research, **SPSS** offers a streamlined interface for performing these calculations with precision. Whether you are a student learning the basics of **statistics** or a seasoned professional conducting academic research, mastering this procedure will significantly enhance your **data analysis** capabilities.

The Role of Descriptive Statistics in Research

Before diving into the technical steps in **SPSS**, it is important to understand why **descriptive statistics** are so foundational to the research process. The primary goal of **descriptive statistics** is to provide a clear and concise summary of the data collected, rather than using the data to make inferences about a larger population. By focusing on the **five-number summary**, researchers can visualize the shape of their data without needing to examine every single individual data point. This

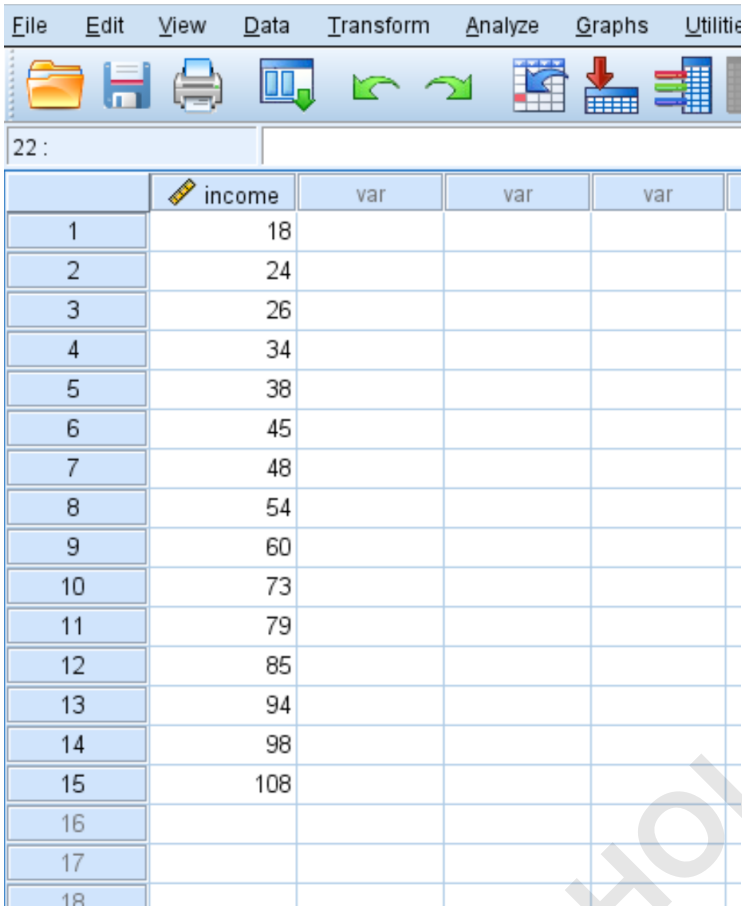
simplification is necessary when dealing with massive datasets where raw numbers are too numerous to interpret visually.

Furthermore, the **five-number summary** acts as a diagnostic tool. If the **median** is significantly closer to the **first quartile** than the **third quartile**, this indicates that the distribution is positively skewed. Conversely, if the distance between the values is roughly equal, the data may follow a **normal distribution**. Identifying these characteristics early in the analysis phase helps in selecting the appropriate parametric or non-parametric tests later in the project. **SPSS** makes these diagnostic observations almost instantaneous through its automated reporting features.

In addition to identifying skewness, these five values are the essential components required to construct a **box plot**. A **box plot** is a graphical representation of the **five-number summary** that makes it easy to spot **outliers** and compare distributions between different groups. Since **SPSS** integrates statistical calculation with graphical output, understanding the numerical summary is the first step toward creating high-quality visualizations for reports and presentations. The following sections will detail how to extract these numbers from your raw data.

Example: Five Number Summary in SPSS

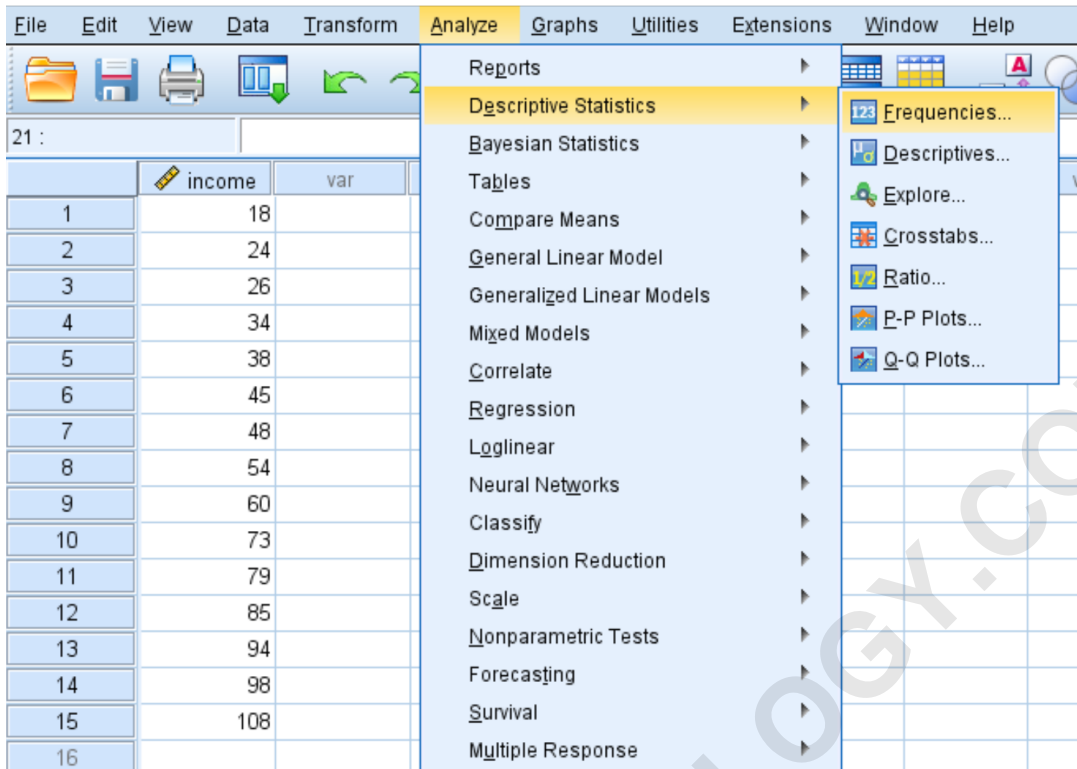
To demonstrate the procedure effectively, let us consider a practical example. Suppose we have a **dataset** in **SPSS** that records the annual income (measured in thousands of dollars) for a sample of 15 individuals. This small sample size is ideal for demonstration purposes, as it allows us to easily verify the results manually if needed. The **variable** we are interested in is "income," and we aim to determine how these earnings are distributed across our sample group.



	income	var	var	var
1	18			
2	24			
3	26			
4	34			
5	38			
6	45			
7	48			
8	54			
9	60			
10	73			
11	79			
12	85			
13	94			
14	98			
15	108			
16				
17				
18				

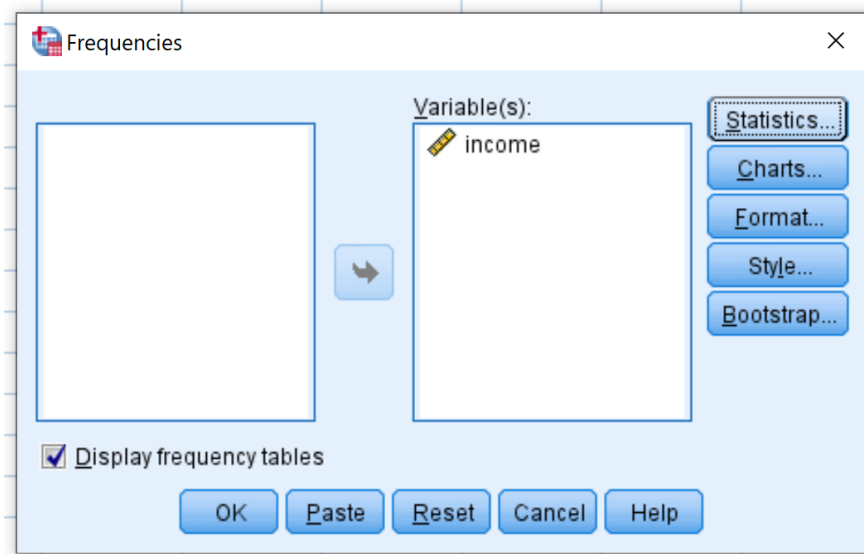
The first step in any **data analysis** task within **SPSS** is ensuring that your data is correctly formatted in the "Data View" tab. Each row should represent an individual observation, while each column represents a **variable**. In this case, the income values are listed in the first column. Once your data is entered and the **variable** levels are appropriately defined (e.g., as "Scale" data for income), you are ready to proceed with the calculation. **SPSS** provides multiple pathways to achieve the same result, but the "Frequencies" method is particularly efficient for summary statistics.

To initiate the calculation for the **five-number summary**, navigate to the top menu bar and click on the **Analyze** tab. From the resulting drop-down menu, hover over **Descriptive Statistics** and select the **Frequencies** option. While the "Explore" menu is also an excellent choice for more detailed analysis, the **Frequencies** command is faster when your primary objective is simply obtaining the quartiles and extreme values. This path opens a specialized dialog box where you can define the parameters of your analysis.



Selecting Variables and Configuring Analysis

Once the **Frequencies** dialog box appears on your screen, you will see a list of all available **variables** from your **dataset** in the left-hand pane. To proceed, locate the **variable** labeled **income** and move it into the "Variable(s)" box on the right. You can do this by clicking on the **variable** name and then clicking the arrow button, or by simply dragging and dropping the name into the box. This step tells **SPSS** exactly which data points it needs to process for the **five-number summary**.



It is important to note that the **Frequencies** menu, by default, is designed to produce frequency tables for categorical data. Since we are working with continuous scale data (income), a frequency table might be too long and not particularly useful. You may choose to uncheck the box labeled "Display frequency tables" at the bottom of the dialog box to keep your output window clean. The real power of this menu lies in the "Statistics" sub-menu, which we will configure in the next step to ensure all five components of the summary are included.

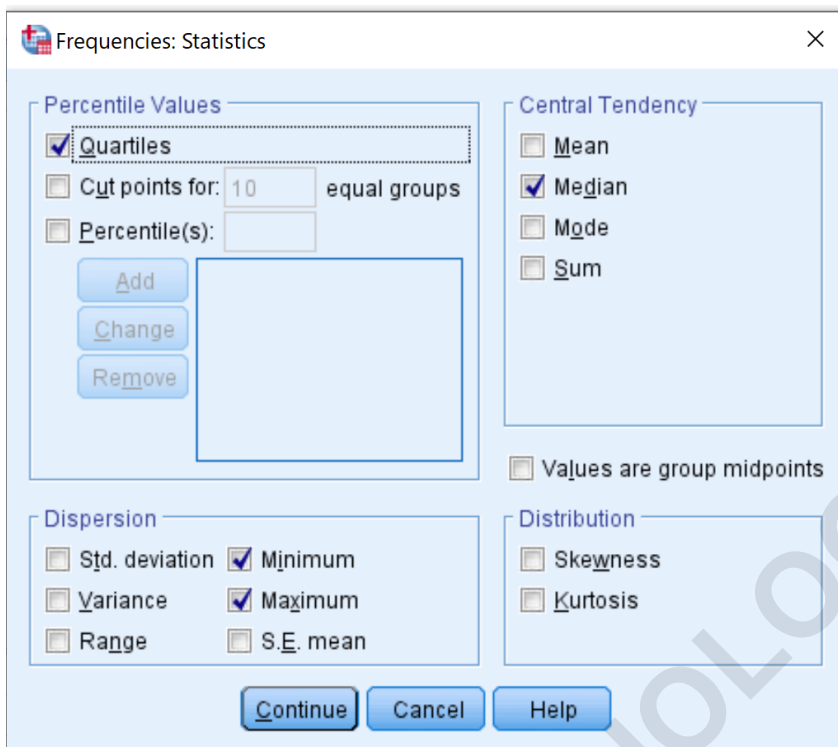
After selecting your **variable**, you must click on the **Statistics** button located on the right side of the dialog box. This action opens a new window containing a wide array of **descriptive statistics** options. To successfully generate a **five-number summary**, you must specifically request the quartiles and the measures of dispersion and central tendency. **SPSS** does not select all five values by default, so manual selection is required to complete the summary requirements.

Defining the Five Summary Statistics

In the **Frequencies: Statistics** sub-menu, you will see several categories of metrics. To capture the **first quartile** and the **third quartile**, ensure that the checkbox for **Quartiles** is selected. This tells **SPSS** to calculate the 25th, 50th, and 75th **percentiles**. Note that the 50th percentile is mathematically equivalent to the **median**, but for clarity, you should also check the box for **Median** under the "Central Tendency" section. This ensures your output is easy to read and explicitly labels the middle value.

Next, you must define the boundaries of your **dataset**. Within the "Dispersion" section of the dialog box, make sure to check the boxes for **Minimum** and **Maximum**. These two values provide the context for the entire distribution, showing the range of income within your sample. By selecting these four options (Quartiles, Median, Minimum, and Maximum), you have effectively requested all

five components of the **five-number summary**. Once these are checked, click the **Continue** button to return to the main dialog window.



Before executing the command, take a moment to review your selections. The **Frequencies** command is highly versatile, and you could also add other metrics like **standard deviation** or **variance** if your research requires them. However, for a standard **five-number summary**, the selections we have made are sufficient. Once you are satisfied with the configuration, click **OK**. **SPSS** will now process the data and display the results in a new Output Viewer window.

Interpreting the SPSS Output Results

The **SPSS** output window will present a table labeled "Statistics" that contains the calculated values for your **variable**. This table is the culmination of the procedure and provides a clear breakdown of the income distribution. By examining this table, you can immediately identify the **five-number summary** values. **SPSS** presents these in an organized list, making it easy to copy them into a research paper or a spreadsheet for further calculation.

Statistics		
income		
N	Valid	15
	Missing	0
Median		54.00
Minimum		18
Maximum		108
Percentiles	25	34.00
	50	54.00
	75	85.00

Based on the example results shown in the image, we can extract the following **five-number summary** for our income **dataset**:

The **minimum** value is **18** (representing \$18,000).

The **first quartile** (25th percentile) is **34.00**.

The **median** (50th percentile) is **54.00**.

The **third quartile** (75th percentile) is **85.00**.

The **maximum** value is **108** (representing \$108,000).

These results tell us a significant amount about the income levels in our group. For example, we can see that the lowest earner makes \$18,000, while the highest earner makes \$108,000. The **median** income of \$54,000 tells us that half of the individuals earn more than this amount and half earn less. Furthermore, the **interquartile range** (calculated as 85.00 minus 34.00) is 51.00, suggesting a fairly wide spread in the middle 50% of the earners. Such insights are invaluable for understanding the socioeconomic profile of your sample.

Advanced Considerations: Skewness and Outliers

When analyzing a **five-number summary**, it is helpful to look at the symmetry of the values. In our example, the distance from the **minimum** to the **median** ($54 - 18 = 36$) is slightly different from the distance from the **median** to the **maximum** ($108 - 54 = 54$). This suggests that the data may have a slight positive skew, meaning there are some higher earners pulling the upper end of the distribution further away from the center than the lower earners. **SPSS** users often use these summaries to determine if the data is "well-behaved" enough for **parametric statistics**.

Another benefit of generating these values in **SPSS** is the identification of **outliers**. While the **five-number summary** itself doesn't explicitly flag **outliers**, you can use the values to perform the "1.5 x IQR" rule. By multiplying the **interquartile range** by 1.5 and adding it to the **third quartile** (or subtracting it from the first), you can define the boundaries for what constitutes an extreme value. If

your **maximum** or **minimum** falls outside these boundaries, **SPSS** visualization tools like the **box plot** will highlight them as individual points.

In professional research environments, the **five-number summary** is often the first thing reported in a "Results" section. It provides the reader with an immediate understanding of the data's scale and variability before the researcher moves into more complex **inferential statistics**, such as regression or ANOVA. By following the steps outlined in this tutorial, you ensure that your **descriptive statistics** are accurate, standardized, and ready for inclusion in any formal academic or professional report.

Conclusion and Additional Resources

Calculating a **five-number summary** in **SPSS** is a straightforward yet powerful process that provides a deep understanding of your **dataset**. By navigating through the **Analyze** and **Descriptive Statistics** menus, you can transform a raw list of numbers into a structured summary that highlights the **minimum**, **maximum**, **median**, and **quartiles**. This procedure is essential for **data cleaning**, initial analysis, and preparing the groundwork for advanced statistical modeling. As you continue to use **SPSS**, you will find that these five values are the foundation of many other diagnostic and visual tools.

If you find yourself working with different software or needing a quick check of your manual calculations, there are several tools available to assist you. For those who prefer working within a spreadsheet environment, learning how to manage these calculations in other programs can be very beneficial. You may find the following resources useful for expanding your statistical toolkit:

[Five Number Summary Calculator](#)

[How to Calculate a Five Number Summary in Excel](#)