What is the process for finding the median of grouped data and what are some examples?

Authored by

stats writer

June 30, 2024

The process for finding the median of grouped data involves several steps. First, the data must be organized into groups or classes. Then, the midpoint of each group or class is determined. Next, the total number of data points is calculated. If the number of data points is odd, the median is the midpoint of the group with the highest frequency. If the number of data points is even, the median is the average of the two midpoints of the two groups with the highest frequencies.

For example, if we have the following data:

Group 1: 10-20
Group 2: 21-30
Group 3: 31-40
Group 4: 41-50

The midpoints of each group would be:
Group 1: 15
Group 2: 25
Group 3: 35
Group 4: 45

If the total number of data points is 10, and the highest frequency is in Group 2 and Group 3, the median would be the average of the two midpoints (25 + 35)/2 = 30.

Some other examples of finding the median of grouped data include calculating the median income for a specific age group, finding the median height in a certain population, or determining the median price range for a particular type of product. This process is commonly used in statistics and data analysis to better understand the central tendency of a set of data.

Find the Median of Grouped Data (With Examples)

Often we may want to calculate the median of data that is grouped in some way.

Recall that the represents the value that lies directly in the middle of a dataset, when all of the values are arranged from smallest to largest.

For example, suppose we have the following grouped data:

Range	Frequency
1-10	2
11-20	7
21-30	10
31-40	3
41-50	1

While it's not possible to calculate the exact median since we don't know the , it is possible to estimate the median using the following formula:

Median of Grouped Data = L + W

where:

L: Lower limit of median classW: Width of median classN: Total FrequencyC: Cumulative frequency up to median classF: Frequency of median class

Note: The median class is the class that contains the value located at N/2. In the example above, there are N = 23 total values. Thus, the median value is the one in

position 23/2 = 11.5, which would be located in the class 21-30.

The following examples show how to calculate the median of grouped data in different scenarios.

Example 1: Calculate the Median of Grouped Data

Suppose we have the following frequency distribution that shows the exam scored receive by 40 students in a certain class:

Exam Score	Frequency
51-60	4
61-70	8
71-80	15
81-90	8
91-100	5

In this example, there are N = 40 total values. Thus, the median value lies in the class where 40/2 = 20 is located. The 20th largest value would be located in the 71-80 class.

Knowing this, we can calculate the following values:

L: Lower limit of median class: 71W: Width of median class: 9N: Total Frequency: 40C: Cumulative frequency up to median class: 12F: Frequency of median class: 15

We can plug these values into the formula to calculate the median of the distribution:

Median = L + WMedian = 71 + 9Median = 75.8

We estimate that the median exam score is 75.8.

Example 2: Calculate the Median of Grouped Data

Suppose we have the following frequency distribution that shows the number of points scored per game by 60 basketball players:

Points Scored	Frequency
1-10	8
11-20	25
21-30	14
31-40	9
41-50	4

In this example, there are N = 60 total values. Thus, the median value lies in the class where 60/2 = 30 is

located. The 30th largest value would be located in the 11-20 class.

Knowing this, we can calculate the following values:

L: Lower limit of median class: 11W: Width of median class: 9N: Total Frequency: 60C: Cumulative frequency up to median class: 8F: Frequency of median class: 25

We can plug these values into the formula to calculate the median of the distribution:

Median = L + WMedian = 11 + 9Median = 18.92

We estimate that the median exam score is 18.92.

Additional Resources

The following tutorials explain how to perform other common operations with grouped data: