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Parameters and Statistics

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Parameters in statistics is an important component of any statistical analysis. In simple words, a parameter is any numerical quantity that characterizes a given population or some aspect of it. This means the parameter tells us something about the whole population.

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Commonly Encountered Parameters

The most common statistics parameters are the measures of central tendency [1]. These tell us how the data behaves on an average basis. For example, mean [2], median [3] and mode [4] are measures of central tendency that give us an idea about where the data concentrates. Standard deviation [5] tells us how the data is spread from the central tendency, i.e. whether the distribution is wide or narrow. Such parameters [6] are often very useful in analysis.

We can have many different statistical data [7] and models built on the same parameter. In the very simple case, consider data sets that have the same mean. We can create infinitely many distributions of data that have the same mean. For example, the data set 23, 27, 31, 35, 39 has a mean of 31 and so does the data set 1, 31, 61. The same parameter of mean can lead to different distributions.

The above is a very simple example, but the concept of a parameter [8] in statistics gains more importance when you study different distributions that occur in nature. The best known example is the normal distribution [9] that occurs in all forms of analysis, from human behavior

to studies related to the universe. This diversity is surprising and forms a cornerstone for a lot of statistical analysis.

In the normal distribution, there are two parameters that can characterize a distribution - the mean and standard deviation. By varying these two parameters, you can get different kinds of normal distributions.

Variables are Not Parameters

As a researcher, it is important to differentiate between variables [10] and parameters in statistics. Variables, like the name suggests, are quantities that can be changed by the experimenter.

For example, the number of cases to study for a given problem is a variable. Thus a researcher might choose a population of 100 people or 150 people, depending on various statistical requirements. This would count as a variable.

A parameter, on the other hand, will be independent of the variable and the number of cases that are taken to study. In fact, the parameters will fix the distribution irrespective of the total number of cases under study.

Different statistical studies require different kinds of parameters for the characterization of data. In many simple cases, the mean or median is a very good indication of the data. For example, if a professor wants to determine the performance of students on a test, the median score is a very good indication of this.

Source URL: <https://explorable.com/parameters-and-statistics>

Links

[1] <https://explorable.com/measures-of-central-tendency> [2] <https://explorable.com/arithmic-mean> [3] <https://explorable.com/calculate-median> [4] <https://explorable.com/statistical-mode> [5] <https://explorable.com/measurement-of-uncertainty-standard-deviation> [6] <http://en.wikipedia.org/wiki/Parameter> [7] <https://explorable.com/statistical-data-sets> [8] <http://www.tutorvista.com/math/statistical-parameter> [9] <https://explorable.com/normal-probability-distribution> [10] <https://explorable.com/research-variables>