

Processing of Study Results by Mathematical Statistical Methods

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Abstract: This article provides a brief overview of the mathematical statistic methods and comments on its use in researches.

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Introduction

The method of statistical analysis is as important to scientific research as it is to other disciplines. At the same time, the phenomena existing in science are evaluated and verified using precise mathematical parameters. Statistics comes from the Latin word "status", which means the state of affairs. The word "status" comes from the words "stato" - state, "statusta" - knowledge of the state, "statustica" - the body of knowledge about the state. The Census in Ancient Egypt 3,500 years ago, the Census of Peter I in Russia and the Book of the Terrible Court in England are the first statistics.

The science of "political arithmetic", which originated in England in the seventeenth century, was the basis for the formation of statistics. Statistics is the study of quantitative aspects of social phenomena in relation to their qualitative aspects. Qualitative aspects of events are studied by specialized disciplines. In particular, sounds, words and sentences are studied in linguistics, rhyme, rhythm, weight, the structure of poetry, literature, organic life, biology and geology of the earth's crust and resources, in pedagogy, the levels of the applied methodology, in sociology, the level of society, in business, the level of profit and etc. Statistics study these phenomena on the basis of quantitative parameters. At the same time, statistics consider the nature of the variability of events under the influence of various factors. In this sense, statistics can reflect the dynamics of events. However, it should be noted that statistics cannot be approached as the only absolute truth and statistics cannot be overestimated. Statistics based on false factual material can lead to misconceptions about events. In this sense, the joke about statistics is as follows: "There are three types of lies: a) lie; b) gross deception; c) statistics".

But today it is impossible to imagine accurate results without the use of mathematical statistical methods. As in any other field, all scientific research uses the mathematical-statistical method.

Main Part

Determination of the patterns of mass random events is based on the study of statistical data - the results of observations. The first task of mathematical statistics is the collection and (if there is a lot of data) methods of grouping statistics.

The second task of mathematical statistics is the development of methods for analyzing statistical data in accordance with the objectives of the study. The study of certain phenomena by methods of mathematical statistics serves as a tool for solving many problems that science and practice promote (correct organization of the technological process, purposeful planning, etc.). Thus, the task of mathematical statistics is to develop methods for collecting and processing statistical data in order to draw scientific and theoretical conclusions.

Mathematical statistics originated with the theory of probability (seventeenth century) and began to be created with it. The further development of mathematical statistics (the second half of the 19th

century - the beginning of the 20th century) is associated primarily with the names of P.L.Chebysheva, A.A.Markova, A.M.Lyapunov, as well as K.Gauss, A.Quetelet, F. Galton, K.Pearson, etc. In the twentieth century there were Soviet mathematicians (V.I.Romanovsky, E.E.Slutsky, A.N.Kolmogorov, N.V.Smirnov), as well as English scientists (Student, R.E.Pearson), American scientists (J.Neumann, A.Wald). most interested in mathematical statistics. c) core and sample sets. Require the study of a set of homogeneous objects in relation to any qualitative or numerical attribute that characterizes these objects. For example, if there is a batch of parts, then the quality mark of the part can be its standard, and the symbol for the quantity can be the size of the part. Sometimes a general check is performed, that is, each of the objects in the set is compared with the character being studied. However, in practice, general checks are rarely used. For example, if the set contains a very large number of objects, then it is physically impossible to conduct a general inspection. In such cases, a limited number of objects are randomly selected and studied from the collection. A collection of samples, or simply a sample, is a collection of randomly selected objects.

The main set is a collection of selected objects. Set size (primary or custom) is the number of items in that set. For example, if out of 1000 pieces. To check, 100 units are taken, then the size of the main set of crows is $N = 1000$, the sample size is $p = 100$.

The core set usually contains a limited number of items. However, if this number is much larger, then it is sometimes assumed that the total set consists of an infinite number of objects, in order to simplify calculations or narrow theoretical conclusions. This is justified by the fact that an increase in the size of the main set (in large volumes) has practically no effect on the results of processing the selected data. D) recurring and non-recurring collections. Representative sampling There are two ways to create a selection: after an object is selected and tracked, it cannot be returned to the main collection or not. Accordingly, the choice is divided into repeating and non-repeating. A reselection is a selection in which the resulting object (before taking the next one) is returned to the main set. An item that is highlighted as a unique set is called a flashback in the main collection. In practice, irreversible random selection is usually used. In order to think with sufficient confidence about the nature of the general opinion of interest to us on the basis of information in the selection, the objects of the sample must accurately describe the main work. This requirement is summarized as follows: the sample must be representative.

Conclusion. Correlation analysis methods are often used to process research results. These mathematical and statistical methods allow you to reproduce research results with minimal error, as well as accurately calculate the effectiveness of the results.

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