# RANDOM VALUES AND THEIR LAWS OF PREPARATION

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**Annotation:**Many of the known connections between different aspects of the world around us now are obtained by analyzing the data collected by humanity. After statistically determining the dependencies, a person finds this or that rational explanation for the patterns that have already been discovered. The formal mathematical aspect of statistical research methods is indifferent to the nature of the objects being studied and is the subject of mathematical statistics.

**Keywords:**Numerical characteristics of a random variable, expected value, standard deviation, scattering, probability density.

A random variable is called a value that accepts values depending on the randomness of the situation. Differentiation is discrete and random continuous quantities. A discrete quantity is called if it receives a set of calculated values. (Example: number of patients at the doctor's appointment, number of letters on the page, number of molecules of a given size). Continuity is the amount that can take values in a certain range. (Example: air temperature, body weight, height, etc.)

Distribution Law A random variable is a set of possible values of a quantity and the probabilities (or frequencies of occurrence) that correspond to these values.

PRI mene R:

| x | x 1 | x 2 | x 3 | x 4 | ... | x n |
|---|-----|-----|-----|-----|-----|-----|
| p | p 1 | 2-bet | p 3 | 4-bet | ... | p n |
| x | x 1 | x 2 | x 3 | x 4 | ... | x n |
| m | m 1 | m 2 | m 3 | m 4 | ... | m n |

NUMBER PROPERTIES OF RANDOM VALUES.

In most cases, in addition to the distribution of a random variable or its substitution, information about these quantities can be provided by numerical parameters Numerical characteristics of a random variable ... The most common: 1 .Expected value is the sum of the products of all possible values of a random variable (average value) on the probability of these values:

2. Dispersion random variable:

$$D(x) = \frac{(x_1 - M(X))^2 m_1 + (x_2 - M(X))^2 m_2 + ... + (x_i - M(X))^2 m_i}{n} =$$

$$(x_1 - M(X))^2 p_1 + (x_2 - M(X))^2 p_2 + ... + (x_i - M(X))^2 p_i = \sum_{i=1}^{n} (M(X) - x_i)^2 p_i$$

3 .Average square deviation:

Rule "Three SIGMA" - if the random variable is distributed according to the normal law, then the deviation of this value from the average to the absolute value does not exceed three times the standard deviation

GAUSS LAW - THE LAW OF NORMAL DEVELOPMENT

Often distributed quantities exist in normal law (Gauss's law). main feature: it is a restrictive law that other distribution laws approach. The random variable is distributed according to the normal law, if any, it looks like the probability density:

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} \exp\left(-\frac{1}{2}\left(\frac{M(x)-x}{\sigma}\right)^2\right)$$

M (X) is the mathematical expectation of a random variable;

is the standard deviation. Probability density (distribution function) shows how the probability changes relative to the interval dx is a random variable depending on the value of the quantity:

**FUNCTIONS OF MATHEMATICS STATISTICS**. Mathematical statistics is a branch of mathematics devoted to mathematical methods of systematization, processing and use of statistical data for scientific and practical purposes. Statistical data refers to information about the number and nature of objects in a set that are more or less specific. A research method based on the consideration of statistical data from individual sets of objects is called statistical. The formal mathematical aspect of statistical research methods is indifferent to the nature of the objects being studied and is the subject of mathematical statistics. The main task of mathematical statistics is to draw conclusions about mass events and processes from the data of their observations or experiments. Statistics is a science that allows us to see patterns in the chaos of random data, highlight the connections made in them, and identify our efforts to increase the proportion of correctly made decisions. Many of the connections that are now known between different aspects of the world around us are obtained by analyzing the data collected by humanity.

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