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COMPUTER TECHNOLOGIES STATISTICAL DATA ANALYSIS

U. Sharstniou, Dean of the Faculty of Economics, associate professor
E. Vardomatskaja, senior lecturer of the Department
of Mathematics and Information Technologies
Y. Vishnevskaya, student
K. Dvoryankina, student
Vitebsk State Technological University, Belarus

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Abstract. The most popular of the specialized statistical packages are considered basic operations that can be performed with quantitative data in their statistical analysis, as well as the principal benefits that accrue to the specialist performs statistical processing of information, for each of the packages.

In view of the rapid scientific and technical progress and a considerable increase in information activities there is an urgent need for analysis of quantitative data. For qualitative performance of various types of statistics data analysis was developed by applied statistical packages, which have capabilities to make the process less time consuming. Statistical packages adapted for use in a variety of modern operating systems have capabilities for data visualization and analysis. Currently, all of the statistical systems are classified into two groups:

1. standard software packages;
2. specialized software packages.

The best known and most widely used specialized packages are the following: STATISTICA, SPSS, STADIA, which has a much larger functions compared to the standard packages and allow you to apply the most modern methods of mathematical statistics for data processing.

Integrated system STATISTICA includes a large number of methods of statistical analysis (more than 250 built-in functions) among which the most often implemented are: basic statistics and tables, nonparametric statistics, analysis of variance, multiple regression, nonlinear estimation, time series analysis and forecasting, cluster analysis, factor analysis, discriminant function analysis, analysis of the duration of life, canonical correlation, multidimensional scaling, structural equation modeling etc. Due to its versatility and simple interface, the system has found application in research in various fields, engineering, business, the educational process.

The package of applied programs of statistical data processing STADIA presents the user with a comprehensive set of the most modern and efficient methods of analysis: descriptive statistics, criteria differences, categorical analysis, analysis of variance, correlational and spectral analysis, smoothing, filtering, prediction, simple, multiple, and step-by-step non-linear regression, discriminant, cluster and factor analyses, scaling, quality control methods, calculation and agreement of the distributions, the analysis and replacement of missing values, etc. This program is ideal for adoption of any scientific, financial, administrative, industrial and even household solutions, as well as to highlight patterns of contingencies, projections of the development process, detecting relationships and differences of a set of objects.

The package of applied programs of statistical data processing SPSS is one of the most powerful, versatile and user-friendly statistical packages abroad. SPSS is able to perform approximately 100 procedures of statistical processing in the base module, and a collection of additional modules is in fact the whole statistical tools; to access data stored in virtually any location, including the ability to easily and quickly connect to multiple databases.

For the solving of statistical tasks in environments Windows, Macintosh, or Unix, designed to specialists involved in scientific research, applied integrated software package STATA. A wide range of STATA statistical capabilities suggested hundreds of advanced statistical tools such as regression for dynamic panel data (DPD), generalized estimating equations (GEE); multilevel mixed models, models of conditional heteroscedasticity, ARCH, and estimation with complex survey samples; standard methods, such as linear and generalized linear models (GLM), ANOVA / MANOVA, ARIMA, cluster analysis, and basic tables and summary statistics. Obtained with the help of this application solution package can be used for VAT in the economy, politics and other social sciences (a wide range of models for panel data) and in biostatistics, epidemiology and other fields of medicine.

Important statistical system, which acts as a world leader among computer systems of symbol mathematics for the PC, provides not only the possibility of performing complex numerical calculations with the output of their results in the most elegant graphics, but also carrying out particularly time-consuming analytical transformations and calculations is the computer algebra system Mathematica. Version Windows systems have a modern user interface and enable you to prepare documents in the form of Notebooks (notebooks). They combine baseline data, descriptions of algorithms for solving problems, programs, and results of the decision in much different form (mathematical formulas, numbers, vectors, matrices, tables and graphs). Mathematica has found its application in such scientific fields as physics, finance, web development.

Computer algebra system Maple provides a comfortable environment for computer experiments, during which they try different approaches to the task, analyzes individual decisions, and if necessary programming are selected requiring special speed fragments. The package allows you to create an integrated environment with other systems and universal programming language of high level. The work is

interactive — the user enters commands and immediately sees the result of their execution on the screen. The package Maple is not similar to traditional programming environment where is a need for strict formalization of all the variables and actions with them. Here, automatically provided by selection of the appropriate types of variables and checks the correctness of operations, so in General, do not require descriptions of variables and a strict formalization of the record.

Mathematical package MathCAD is used to solve problems in various sectors of science and technology, finance and economics, physics and astronomy, engineering and architecture, mathematics, and statistics, organization of production and management. System MathCad has a wide range of instrumental, informational, and graphic media. It is in great demand among students, engineers, economists, managers, researchers and all those who are involved with quantitative methods of calculation.

Well known for the vast majority of people is the program Microsoft Excel. Feature of the program is that it allows you to make complex calculations. That is, in the calculation process you can simultaneously use data that are located in different areas of the spreadsheet and linked on a certain bridge. The implementation of such calculations is due to the possibility of introducing different formulas in table cells. The function is evaluated and the result will be displayed in the cell with the formula. Available in a range of formulas are different functions, from addition and subtraction to calculations related to finance or statistics.

The software package "Olymp" implements almost all the areas of analyzing data using mathematical-statistical methods. The possibility of obtaining good results with minimum effort due to automation of the computational process makes the program suitable for a wide range of analysts. As practice shows the use of the program, it is an effective tool for solving many of the challenges facing auditors, employees of analytical departments of banks, financial, investment, petroleum, etc. companies, financial managers of enterprises, working on the market of goods and services.

Last but not least, system features which are considered as spreadsheet Lotus 1-2-3, a professional spreadsheet. Wide graphic capabilities and a convenient interface pack allow you to quickly navigate it. It can be used to create any financial document, a report for accounting, budget, and then place all these documents in databases. Lotus1-2-3 includes strong enough data analysis and data processing.

In conclusion of all mentioned above, it is necessary to say that in the process of treatment and subsequent analysis of quantitative data, the experts should apply the considered statistical system, as this will allow them to conduct statistics data processing of different directions, to carry out particularly laborious analytical transformations and calculations to do it with minimal cost and time to obtain high-quality results and models that can be used to implement the predictions and identify patterns of development of the various processes.

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PROFESSIONAL DEVELOPMENT OF TEACHERS FOR PERFECTING OF ECOLOGICAL EDUCATION

A. Tsimanava, associate professor of the Department of Occupational health and chemistry

I. Semianchukova, Dean of the Faculty of Professional Development and retraining of personnel, associate professor

A. Hrachanikau, associate professor of the Department of Occupational health and chemistry

Vitebsk State Technological University, Belarus

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Absrtract. Basic condition of overcoming environmental problems of global and regional character is formirovakny future experts capable to find and to competently realize paths of optimization of environmental management on the basis of the principles of sustainable development which demands particular training of teachers. For perfecting of ecological education at universities of Belarus, Russia and Ukraine since 2014 the TEMPUS joint project supported by partner universities from the countries of the European Union is carried out. Within the project training programs are developed, distant training courses, professional development in the field of ecological education of teachers and teachers of UVO, USSO, UPTO are created and successfully approved.