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Environment for statistical computing

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Abstract

This paper is a short exposition on the current state of art as far as statistical software is concerned. The main aims are to take a look at current tendencies in information technologies for statistics and data analysis, especially for describing selected programs and systems.

We start with statistical packages, i.e.Â a suite of computer programs that are specialized in statistical analysis, to enable people to obtain the results of standard statistical procedures without requiring low-level numerical programming, and to provide facilities of data management. A big surprise for many statisticians is that the most typical representative in this domain is Microsoft Excel. Aside from that, we touch upon a few commercial packages, a few general public license packages, and a few analysis packages with statistics add-ons.

An integrated environment for statistical computing and graphics is essential for developing and understanding new techniques in statistics. Such an environment must

essentially be a programming language. Therefore, we take a closer look at several typical representatives of these types of programmes, and on a few general purpose languages with statistics libraries.

However, there exists quite a clear distinction between practical and theoretical approaches to most statistical work. The majority of software products for statistics are on the practical side, using numerical and graphical methods to provide the user access to existing methods. On the other hand, software packages specifically designed just for pure statisticalâ€“mathematical modelling do not exist. Nevertheless, all available computer algebra and/or mathematical systems offer tools for theoretical statistical work. Therefore, we take a look at some possibilities in this area.

Finally, we summarize several major driving forces that will influence, according to our strong belief, the statistical software development process in the near future. Due to limited space, these discussions are cursory in nature for the most part. This paper is based on the personal experience of the author as described in [J. Antoch, Series of papers on statistical software and environments for statistical computing (in Czech for the Czech Statistical Society Newsletter and other publications).Â [1]] and on the information available on Internet. Very good and interesting source of information is especially Google search machine [Google search machine.Â [12]], Wikipedia [Wikipedia, a multilingual web-based, free content encyclopedia project.Â [25]] and the journal Scientific Computing World [Scientific Computing World Journal.Â [22]].

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