

## A GUIDE TO *MESOSAUR*: A PROGRAM FOR THE STATISTICAL ANALYSIS OF TIME SERIES

*MESOSAUR* is a computer program for the statistical analysis of time series, which was created by a team of programmers and statisticians at the *Central Economics and Mathematics Institute: CEMI* in Moscow. In some respects, it is a model of software engineering. It runs very swiftly, even on machines that are virtually obsolete, and it is very sparing in its demands for computer memory. It has an well-designed interface based on menus and key-commands, which makes all of its functions readily accessible. Embedded in the program is a reference section, which explains the basic terms in time-series analysis and which describes the methods and models applied in the program. This amounts to a small textbook.

### Accessing the Program

The *MESOSAUR* program may be downloaded from the web page *Programs and Manuals* by clicking on the legend *MESOSAUR Zip File*. The file `meso.zip` can be assigned to your personal directory, if you are operating with the CFS system, or to the place of your choice, if you are downloading it onto a personal computer.

The `meso.zip` file can be unpacked to reveal a directory labelled `RUSKY`, which contains various binary files, executable files and subdirectories. The subdirectories are labelled `DEMO`, `ARCHIVE`, `IMPEX`, `ARMATEST` and `XYARMA`. The `DEMO` directory contains a variety of data files, which are packed into `DEMO.MES`. These are in a format that is native to *MESOSAUR*. The data are also available in an ASCII (i.e. `.txt`) format via the *Data Sets* web page.

The `ARCHIVE` and `IMPEX` directories are empty. They are the locations where you might store your own data files in ASCII format. The `ARMATEST` and `XYARMA` directories, of which the contents are also available via the *Data Sets* page, contain data sequences that have been generated by a pseudo random number generator in conjunction with the specifications of various autoregressive moving-average models.

The *MESOSAUR* program is activated by clicking on the plain icon labelled `MESOSAUR.EXE`. The other items within the `RUSKY` directory may be ignored, with the possible exception of `MESOCNF.EXE`, which can be used to re-configure the program to work with your own computer and to change the language of the interface of *MESOSAUR* from English to Russian, should you so wish. The program should be configured already to work with the CFS. To adapt it to another *Windows* system, you may rely on the auto-configuration facility of `MESOCNF.EXE`.

## Operating the Program

On starting the program, *MESOSAUR* confronts you with its title screen, which is dismissed by typing **<Return>**. This will bring you to the upper level of the program. Across the top of the screen, just below a prompt line, will be found a menu bar bearing the following labels:

<b>System I/O Variable VisualAnalysis Statistics Models</b>
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You pass from one item on the menu to another by using the horizontal arrow keys **<←>** and **<→>**. As you do so, the directories associated with each menu item are displayed. To select a command from within the current menu directory, you may either press the keys which are indicated, or else you may select the command by using the **<↑>** and **<↓>** keys and by typing **<Return>**.

**Opening a Demo Data File.** To open a data file, you must move to the **I/O** menu. To select one of the files in the **DEMO** data directory, which stands beside the program in the **RUSKY** directory, you should execute the command **File** within the directory of the **I/O** menu by typing **<Ctrl-F>** or by another means. You will be presented with the **DATA FILE DIRECTORY** which lists the file **DEMO** as the only item. This must be opened. Now follow the instruction given at the bottom of the screen which is to press **<Insert>**. A local menu pops up. Select **Open**—by pressing **<O>** or by selecting the command via the arrow keys and by pressing **<Enter>**.

The full list of variables or time series in the **DEMO** directory is now displayed. One of the variables in the table—the current variable—is highlighted. To choose another variable, move up or down the list via the arrow keys **<↑>** and **<↓>**. When the appropriate variable has been selected—say, for example, **airpass**—it may be read into the memory of the computer by pressing **<Insert>** to access the local menu again and by selecting the **Read** command. Had the **Read** command been applied to the **DEMO** directory before opening it and selecting a variable, then its entire contents would have been read into the memory.

To return to the upper level of the program—ie. to the menu bar—press the **<Esc>** key and respond to the queries that the program poses via a dialogue box. *MESOSAUR* will alert you to the danger of exiting the program by pressing the **<Esc>** key too often and rising too far. With the data in memory, one is able to perform operations of analysis and display. Usually, the immediate concern is to plot the series by issuing the relevant command under the menu **VisualAnalysis**.

**Opening an ASCII Data File.** To select one of the ASCII files within the **TESTARMA** sub directory or within the **XYARMA** sub directory of the **RUSKY** directory, you must access the **Import->** command under the **I/O** menu. The command has a sub-menu where various options are displayed. Press **<Return>** to access the sub-menu. Since the data in **TESTARMA** are stored as Text, the **ASCII** option, which is the first item, must be selected from the sub-menu. Pressing **<Return>** again will lead to a dialog box into which the file name and the path to the import directory can be entered.

Unless you have scanned the directory in advance, you will not know the name of any data file. Therefore, you might press the **<->|>** tab key to move the cursor to the **Import Directory** field. There, you will find pre-existing entry in the form of **C:\RUSKY\IMPEX**, where **C** denotes the disc or virtual disc on which the **RUSKY** directory resides. This path can be changed to **C:\RUSKY\TESTARMA**. Thereafter, pressing **<Ctrl-F>** will bring a list of the files into view. A file may be selected from this list and read by pressing **<Return>**.