

# “Readme” file of the TSdist package.

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This document provides the installation instructions and prerequisites for the TSdist package of R.

## 1 Installation prerequisites

- **R software:** The last version of the software can be downloaded from <http://www.r-project.org/>.
- **Other required R packages:** These packages are listed in the Depends and Imports fields of the Description file of the package, and they can all be found in the CRAN repository. The dependencies are installed automatically if the automatic installation mode is chosen, but they must be installed manually if the manual installation mode is selected (not recommended). The complete instructions for both these types of installations are contained in the following sections.
- **Some suggested (but not required) R packages:** *testthat* is an R package that allows the inclusion of unit tests in R packages. The installation of this package is only necessary if the user is interested in executing the unit tests of the TSdist package. This package can be found in <http://cran.r-project.org/web/packages/testthat/index.html>.
- **C compiler:** The TSdist package includes some internal functions programmed in C language. As such, if the package is installed from source (as is the case of most Unix based distributions), then a C compiler (such as gcc) should be installed. If the installation of TSdist is done from binary files obtained from CRAN (for Windows, and some OS distributions) then the compiler is not necessary.
- **Other pre-requisites:** package *rgl*, on which TSdist depends, requires a windowing system such as X11 (unix), carbon (os-x) or win32 (Windows) and OpenGL libraries. These are already available in most systems, but in case of errors during the installation, the instructions to install these components can be found in the README file of the *rgl* package (<https://cran.r-project.org/web/packages/rgl/README>).

## 2 Installation instructions

### 2.1 Automatic installation from the CRAN repository

The simplest and recommended way to install the **TSdist** package is by connecting to the CRAN repository, where the package is hosted. The following command will download and install the **TSdist** package in Linux, Mac-OS and Windows systems from CRAN:

```
> install.packages("TSdist", dependencies=TRUE)
```

When executing this command, R will prompt the user to choose a mirror of the CRAN repository. The recommendation issued by the R team is to select the mirror closest to the user, to minimize network load. This method will automatically install the entire dependency tree of **TSdist** and the **TSdist** package itself and is thus the most common method to install R packages. Remember that, for Unix distributions, a C compiler must be installed in order to correctly compile the C code within the package.

### 2.2 Manual installation (not recommended)

Manual installation is usually used for packages which are not in CRAN or other common R-package repositories, and in very specific circumstances. As such, we do not recommend this type of installation for **TSdist**, especially for non-expert R users. However, in the following sections we include a complete guide of how this advanced type of installation can be carried out.

To install **TSdist** manually from the source files, in Unix systems (except some OS versions), we would have to download the package manually from CRAN (<https://cran.r-project.org/web/packages/TSdist/index.html>). If we want to install **TSdist** manually in Windows, OS X Snow Leopard or OS X Mavericks, since the package contains some C code, we will need the binary files, which are available in the same direction.

Additionally, if we choose this option, all the packages **TSdist** depends on and the dependencies of these will also have to be installed before the installation of **TSdist**. To obtain the whole set of dependencies of an R package we can execute the following code:

```
> library(tools)
> package_dependencies(packages="TSdist",
+ db = available.packages(),
+ which = c("Depends", "Imports"),
+ recursive = TRUE, reverse = FALSE,
+ verbose = getOption("verbose"))
```

To obtain only the dependencies which have not been installed:

```
> library(tools)
> x<-package_dependencies(packages = "TSdist",
+ db = available.packages(),
+ which = c("Depends", "Imports", "LinkingTo"), recursive = TRUE,
+ reverse = FALSE,
```

```
+ verbose = getOption("verbose"))
> y<-installed.packages()
> setdiff(x[[1]],y[,1])
```

In this case, the dependency tree is conformed of the following packages:

|                         |            |             |              |
|-------------------------|------------|-------------|--------------|
| [1] "ifultools"         | "splus2R"  | "grid"      | "MASS"       |
| [5] "lattice"           | "wmtsa"    | "misc3d"    | "rgl"        |
| [9] "class"             | "clv"      | "grDevices" | "utils"      |
| [13] "stats"            | "graphics" | "methods"   | "cluster"    |
| [17] "longitudinalData" | "pdc"      | "locpol"    | "KernSmooth" |
| [21] "TSclust"          | "dtw"      | "xts"       | "zoo"        |
| [25] "proxy"            |            |             |              |

Packages `grid`, `stats`, `graphics`, `methods`, `utils` and `grDevices` are installed together with the base installation of R and do not have to be installed again. The rest of these packages can be downloaded from [http://cran.r-project.org/web/packages/package\\_name/index.html](http://cran.r-project.org/web/packages/package_name/index.html), by modifying **package\_name** by the name of the corresponding package.

The installation must be done in the correct order, in order to respect the dependencies between the packages. As such, once we have downloaded the required packages (including `TSdist`), we must save them all in a directory. Then we execute the following commands:

```
> library(tools)
> write_PACKAGES("/path/to/packages/")
> install.packages("TSdist", contriburl="file:///path/to/packages/")
```

Note that, if the manual installation is carried out in Windows, then `write_PACKAGES()` generates two files: `PACKAGES` and `PACKAGES.gz` under the `'/path/to/packages/'` directory where all zip files are placed. The file `PACKAGES.gz` should be deleted before `install.packages()` function is executed.

Remember that, in the case of Unix-like systems, a C compiler must be installed in order to correctly compile the C code within the package. Furthermore, some dependencies could require the installation of some system libraries (i.e. package `rgl` requires a windowing system such as X11, carbon or win32 and OpenGL libraries as commented above). These libraries are generally installed by default in most systems, but in case of errors, the user should access the README files and documentation of the corresponding package, in which the installation process is explained in detail.

For more information on installing and administrating R and its packages see [http://cran.r-project.org/doc/manuals/r-release/R-admin.html#Installing-R-under-Unix\\_002dalikes](http://cran.r-project.org/doc/manuals/r-release/R-admin.html#Installing-R-under-Unix_002dalikes).

### 3 Use of `TSdist`

To begin to use the `TSdist` package in R, we just need to type the following command in the R console:

```
> library(TSdist)
```