

# Building R packages for Windows

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# Outline

- 1 **Installing the required tools**
- 2 Creating the package
- 3 Putting your package on CRAN
- 4 More advanced features

# Installing the required tools

To build an R package in Windows, you will need to install some additional software tools.

## Links and detailed instructions:

[www.murdoch-sutherland.com/Rtools](http://www.murdoch-sutherland.com/Rtools)

- Rtools (*essential*)
- Microsoft HTML Help Workshop (*optional*)
- MikTeX (*optional*)

# Essential: Rtools

## Contains:

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## Download from:

[www.murdoch-sutherland.com/Rtools/](http://www.murdoch-sutherland.com/Rtools/)

Run latest version of Rtools. Choose default “Package authoring installation”.

# Optional: Microsoft HTML Help Workshop

- Used for producing compiled html help files.
- You can produce an R package without it, but the package will not contain chm files.
- Download from [go.microsoft.com/fwlink/?LinkId=14188](https://go.microsoft.com/fwlink/?LinkId=14188)

# Optional: MikTeX

- MikTeX is used for producing the pdf help files.
- You can produce an R package without it, but the package will not contain pdf help files. You may have this installed already.
- Download from

[www.miktex.org](http://www.miktex.org)

# Essential: Setting PATH variable

- The PATH variable tells Windows where to find the relevant programs.
- The path variable may have already been fixed when installing Rtools.
- To add a directory to your PATH on Windows XP select  
Control Panel → System → Advanced  
→ Environment Variables
- You should check that it looks something like  
this:

```
C:\Rtools\bin;C:\Rtools\perl\bin;C:\Rtools\MinGW\bin;  
C:\Program files\R\R-2.7.0\bin;  
C:\Program Files\HTML Help Workshop;<others>
```



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- If you have not installed HTML Help workshop, you will need to set `WINHELP=NO` in `MkRules` (in the directory `C:\Program files\R\R-2.7.0\src\gnuwin32`).

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- The `htmlhelp` part of the `PATH` can be omitted if you did not install the HTML help workshop.
- If you have not installed HTML Help workshop, you will need to set `WINHELP=NO` in `MkRules` (in the directory `C:\Program files\R\R-2.7.0\src\gnuwin32`).
- If there are problems, please read the `Rtools.txt` file *carefully*.

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# Creating the package

Information about creating packages is provided in the document “Writing R extensions” (available under the R Help menu) or at

[cran.r-project.org/doc/manuals/R-exts.html](http://cran.r-project.org/doc/manuals/R-exts.html)

This document should be read!

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package.skeleton(name="fred",list=ls())
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package.skeleton(name="fred",list=ls())
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- This will generate a directory `fred` and several sub-directories in the required structure.

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- The `package.skeleton()` command will have created these files for you.
- You now need to edit them so they contain the right information.

# DESCRIPTION file

Package: fred

Version: 0.5

Date: 2008-06-29

Title: My first collection of functions

Author: Joe Developer <Joe.Developer@some.domain.net>,  
with contributions from A. User <A.User@whereever.net>.

Maintainer: Joe Developer <Joe.Developer@some.domain.net>

Depends: R (>= 2.2.0), forecast

Suggests: tseries

Description: A short (one paragraph) description of what  
the package does and why it may be useful.

License: GPL version 2 or newer

URL: <http://www.another.url>

# Rd files

- Help files for each function or data set in the `man` subdirectory under `fred`
- In a simple markup language resembling  $\text{\LaTeX}$ .
- Detailed instructions for writing R documentation:

```
cran.r-project.org/doc/manuals/R-exts.html  
#Writing-R-documentation-files
```



# Rd files

```
\name{seasadj}
\alias{seasadj}
\title{Seasonal adjustment}
\usage{seasadj(object)}

\arguments{
\item{object}{Object created by \link[stats]{decompose}
or \link[stats]{stl}.}
}

\description{Returns seasonally adjusted data constructed
by removing the seasonal component.}

\value{Univariate time series.}

\seealso{\code{\link[stats]{stl}}, \code{\link[stats]{decompose}}}

\author{Rob J Hyndman}

\examples{
plot(AirPassengers)
lines(seasadj(decompose(AirPassengers,"multiplicative")),col=4)
}
```

# Including C or Fortran code

If your R code calls C or Fortran functions, the source code for these functions needs to be placed in the subdirectory

`fred/src`

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- This will compile all the necessary information and create a zip file which should be ready to load in R.

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- The checks are quite strict. A package will often work ok even if it doesn't pass these tests. But it is good practice to build packages that do satisfy these tests as it may save problems later.

# Building a package for other operating systems

- To build a package for something other than a Windows computer, use  
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- To build a package for something other than a Windows computer, use `Rcmd build fred`
- This creates a `tar.gz` file which can then be installed on a non-Windows computer.

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using 'anonymous' as log-in name and your  
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using 'anonymous' as log-in name and your  
e-mail address as password.
- 4 Send a message to `CRAN@R-project.org`  
about it.

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- Save this in a textfile called **NAMESPACE** in the top level package directory.

# S3 methods

## Example

```
average <- function(x)
{
  ave <- sum(x)/length(x)
  structure(list(ave=ave,x=x),class="average")
}

plot.average <- function(object, ...)
{
  boxplot(object$x)
  abline(h=object$ave,col=2,lwd=2)
}
```

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average <- function(x)
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  ave <- sum(x)/length(x)
  structure(list(ave=ave,x=x),class="average")
}
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```
plot.average <- function(object, ...)
{
  boxplot(object$x)
  abline(h=object$ave,col=2,lwd=2)
}
```

**Usage** plot(average(rnorm(20)))

# S3 methods

**Add to your NAMESPACE file:**

```
S3method(plot, average)
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**For new S3 methods, add to an R file:**

```
forecast <- function(object,...)  
  UseMethod("forecast")
```

# C code

- Put C code in the `src` subdirectory.
- In an R file:

```
f <- function(x)
  .Call("foo", x, PACKAGE="fred")
```
- In the `NAMESPACE` file

```
useDynLib(fred)
export(f)
```

# Conclusion

There is a lot more information in

[cran.r-project.org/doc/manuals/R-exts.html](https://cran.r-project.org/doc/manuals/R-exts.html)