# Building R packages for Windows

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## 1. Installing the required tools

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

http://cranrprojectorg/binwindowsRtools/ (http://cran.r-project.org/bin/windows/Rtools/)

### 1.1 Essential: Rtools

This is a collection of unix-like tools that can be run from the DOS command prompt. It also contains the MinGW compilers that are used for compiling Fortran and C code. You should download and run the version corresponding to the flavour of R you are using. When asked, choose the default "Package authoring installation" to build add-on packages.

### 1.2 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. Most of you will have this installed anyway. Download from

http://wwwmiktexorg (http://www.miktex.org)

### 1.3 Essential: Setting PATH variable

The PATH variable tells Windows where to find the relevant programs. To add a directory to your PATH on Windows select

```
Control Panel -> System -> Advanced -> Environment Variables
```

The path variable may have already been fixed in step 1.1. In any case, you should check that it looks something like this:

```
C:\Rtools\bin;C:\Program files\R\R-2.15.1\bin\x64;
```

The last directory will depend on whether you have a 32-bit or 64-bit operating system. It should be the directory that contains the file `Rcmd.exe`

- The precise directories will depend where you have installed the various tools. The above path should work if you have followed the default installation procedure. If the directory names contain spaces, put them in quotation marks.
- I have assumed R2.15.1. For later versions, simply change the above paths to the relevant R version. It will probably then still work.
- If there are problems, please read the Rtools.txt file carefully.

## 2 Creating the package

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

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

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The main items are summarized below to get you started, but you will almost certainly need to consult the above document if you are to successfully compile a package.

### 2.1 Use package.skeleton()

The simplest way to create a package is to first create an R workspace containing all the relevant functions and data sets that you want to include in the package. Delete anything from the workspace that you do not want to include in the package. Make sure the current directory is set to whereever you want create the package. Use

```
setwd("C:/My Documents/Rpackages")
```

for example. Then, to create a package called `"fred"`, use the R command

```
package.skeleton(name="fred")
```

This will generate a directory `fred` and several sub-directories in the required structure.

### 2.2 Editing the files

A package consists of a directory containing a file 'DESCRIPTION' and usually has the subdirectories `R`, `data` and `man`. The package directory should be given the same name as the package. The `package.skeleton` command above will have created these files for you. You now need to edit them so they contain the right information.

### 2.3 DESCRIPTION file

The DESCRIPTION file contains basic information about the package in the following format:

```
Package: pkgname
Version: 0.5
Date: 2007-06-05
Title: My first collection of functions
Author: Joe Developer , with
contributions from A. User .
Maintainer: Joe Developer
Depends: R (>= 2.0.0), 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
```

### 2.4 Rd files

The help files for each function and data set are given in "R documentation" (Rd) files in the `man` subdirectory. These are in a simple markup language closely resembling LaTeX, which can be processed into a variety of formats, including LaTeX, HTML and plain text. As an example, here is the file which documents the function `seasadj` in the `forecast` package.


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-  Kevin Little
  thank you, i use R Studio and R underneath, do I need to be running R3, my main system is still...

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  day ago (http://robjhyndman.com/hyndsight/revolu
  1040286994)

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

\arguments{
\item{object}{Object created by \code{\link[stats]{decompose}}
or \code{\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)
}

\keyword{ts}
```

Detailed instructions for writing R documentation are at

http://cranr-projectorg/docmanualsRextshtml#WritingRdocumentationfiles (http://cran.r-project.org/doc/manuals/R-exts.html#Writing-R-documentation-files)

## 2.5 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 `src` under `fred`.

## 2.6 Compiling the package for Windows

To compile the package into a zip file, go to a DOS prompt in the directory containing your package. (i.e., the directory `"C:\My Documents\Rpackages"` in the above example. Then type

```
Rcmd INSTALL --build fred
```

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

## 2.7 Checking the package

To check that the package satisfies the requirements for a CRAN package, use

```
Rcmd check fred
```

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.

## 2.8 Building a package for other operating systems

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. It can also be uploaded to CRAN provided it satisfies the above tests.

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Steve • 4 years ago

Rob, thanks for posting this but I am still struggling to make your example work. All the steps work up to

Rcmd build --binary fred

*** installing help indices
Error in Rd_info(db[[i]]) : Rd files must have a non-empty \title.
See chapter 'Writing R documentation' in manual 'Writing R Extensions'.
* removing 'C:/Users/eick/AppData/Local/Temp/Rinst1284800485/fred'
ERROR
* installation failed

My \title is fine and Rcmd build works fine if I take out the --binary but the resulting fred_1.0.tar.gz won't install.

Reply Share ›

Rob J Hyndman Mod → Steve • 4 years ago

It sounds like some kind of problem with your Rd files rather than with the software needed to build a package for Windows. build without --binary is just zipping up your directory and not processing any files.

Reply Share ›

David Scott • 4 years ago

I recommended this post on R-help as being useful. Uwe Ligges rightly pointed out there have been changes since R-2.10.0:

" ... these instructions are outdated since there is no chm help
support for R-2.10.x, for example."

You may wish to update

Reply Share ›

Rob J Hyndman Mod → David Scott • 4 years ago

Thanks David. I've updated the instructions

Thanks David. I've updated the instructions.

Reply Share ›

alex • 4 years ago

I have done my R package on UNIX, and it did not work in Windows. I tried to build R package using above steps.

But there is no RCMD command on DOS prompt , it show it is not recognized as internal or external command.

Do you know the reason? My PC os is windows7. Thanks

Reply Share ›

Rob J Hyndman Mod ➔ alex • 4 years ago

If Rcmd is not recognized at the DOS prompt then you don't have the path to the R bin directory set up properly (step 1.3). Type "path" at the DOS prompt and check that the directory is listed.

1 Reply Share ›

yaser • 

Thank you for your useful comments. I did all steps respectively to build package with name: mypkg
I instal Rtools and MikTeX and I did step 1.3 to add this paths:
C:\Rtools\bin
C:\Rtools\perl\bin
C:\Rtools\MinGW\bin
C:\Program Files\R\R-2.11.1\bin

By using this prompts in R, I make mypkg folder in:
C:\Users\Yaser\Documents
> require(stats)
> f package.skeleton(list="f", name="mypkg")

So I changed MS-Dos Command prompt to:
C:\Users\Yaser\Documents>_
But when I run "Rcmd build -binary mypkg" or "Rcmd build mypkg" in , I see this Error:
'Rcmd' is not recogonized as an internal or external command, operable program or batch file.

I need your help to make package, I have some functions that want to convert them in package. I need your help, if it is possible, I want from you to make a graphic or video view of all above steps.
With many thanks
Good luck

Reply Share ›

Rob J Hyndman Mod ➔ yaser • 3 years ago

It looks like you ignored my last advice. I really can't provide general help on all things related to R and DOS. Try reading a manual.

Reply Share ›

alex • 4 years ago

Thank you for your quick respose. I found it in C:\Program Files (x86)\R\R-2.10.1\bin. However, when I run Rcmd install mypackage. it showed it can't open perl script "C:\PROGRA~2\R\R-210~1.1\bin\install".

I cannot find it either , I changed path in way as above.

Do you have suggestion? Thanks.

have a good day!

have a good day!

Reply Share ›

alex • 4 years ago

Sorry. I installed it in R GUI. Thanks you for your help.

Reply Share ›

mery • 3 years ago

i have a question.
when i run R CMD check mypackage, it showed "Installation failed" when it is checking whether package "mypackage" can be installed...ERROR

Reply Share ›

> Rob J Hyndman Mod ➔ mery • 3 years ago
>
> You need to read the rest of the output to figure out what the error is. Try closing R and make sure nothing else is accessing the relevant directory.
>
> Reply Share ›

mery • 3 years ago

Thanks, one error is in DESCRIPTION file! Now i'll hope that it's all ok!

Reply Share ›

mery • 3 years ago

sorry i've another problem when i checked mypackage:

it showed "Found possibly globabl 'T' or 'F' in the following functios: A, B, C" when it is checking R code for possible errors....NOTE

Reply Share ›

> Rob J Hyndman Mod ➔ mery • 3 years ago
>
> Try reading the manuals.
>
> Reply Share ›

Lxmi • 3 years ago

Hi,
When I was doing R CMD check mypackage I got an error saying that :
checking whether the package can be loaded: ERROR
Error in library(test): there is no package called 'test'
Execution halted
It looks like this package has a loading problem ... "

Any help is appreciated.
Thanks in advance..
–Lxmi

Reply Share ›

Jane • 3 years ago

Hi,
Thank you for this summary page!
I have a package I was previously able to compile and use for R 2.6.
In the newer versions of R it did not work, so I am making it from scratch using Rtools and new R version.

However, I keep getting error after Rcmd build --binary mypack

* checking for file 'mypack/DESCRIPTION' ... OK
* preparing 'mypack':
* checking DESCRIPTION meta-information ... OK
* removing junk files
* checking for LF line-endings in source and make files
* checking for empty or unneeded directories

* building binary distribution
* installing *source* package 'mypack' ...
** R
** preparing package for lazy loading

---

see more

Reply Share ›

Rob J Hyndman Mod ➔ Jane • 3 years ago

Jane. Read the error message. It helpfully says to run the function installXLSXsupport() from the gdata package in order to complete its installation.

Reply Share ›

Jane • 3 years ago

These are just warnings.
The error comes from:
Error in winMenuAdd(menuname, NULL, NULL) :
Menu functions can only be used in the GUI

Thanks!

Reply Share ›

Vishal Gokhale • 3 years ago

Thanks for the page.
It helped me to avoid restarting the machine in Ubuntu every time I wanted to make a code change to debug a certain piece of code.
However I noticed that running just below command results into an error
---
>package.skeleton(name="fred")
Error in !have : invalid argument type
---
Using the command (below) instead works
You might want to change just that bit to make it perfect :)
---
>package.skeleton(name = "fred", environment = .GlobalEnv, path = ".", force = FALSE, namespace = FALSE)
Creating directories ...
Creating DESCRIPTION ...
Creating Read-and-delete-me ...
Saving functions and data ...
Making help files ...
Done.
Further steps are described in './fred/Read-and-delete-me'.
---

Reply Share ›

Rob J Hyndman Mod ➔ Vishal Gokhale • 3 years ago

Your additional arguments are just the defaults, so this should not make any difference. I suspect there is another problem, but it is not obvious from the error what it might be.

Reply Share ›

Tal Galili • 

This seems to happen because there are no objects in the environment.

See here for a simple fix:
https://stat.ethz.ch/pipermail...

Reply Share ›

Roger • 3 years ago

Hi, thank you so much for this summary. It's very nice and clear.

I followed all the steps outlined here, however, I still got some problems when I try to enter the dos commands.

If I entered "Rcmd build curves2", everything is fine, and the package can be installed in R in Mac.
However, if I entered "Rcmd build --binary curves2". There seems to be one error. (Though I can still see one package appear after this command is run, however, it's not installable in R under windows)
Could you please help me out of this? Thanks so much~~

The dos results are as follows:

C:\Users\z4432045>Rcmd build --binary curves2
* checking for file 'curves2/DESCRIPTION' ... OK
* preparing 'curves2':
* checking DESCRIPTION meta-information ... OK
* cleaning src

see more

Reply Share ›

Roger • 3 years ago

I am sorry that my comment was too long and some dos results are missing. The rest dos results are here(The error is shown in the last line):

util.c:1040:5: warning: statement with no effect
util.c: In function 'min':
util.c:858:1: warning: control reaches end of non-void function
gcc -shared -s -static-libgcc -o curves2.dll tmp.def dcdflib.o ipmpar.o mcmc.o n
etworks.o profile.o rand.o splines.o util.o -LC:/PROGRA~1/R/R-212~1.2/bin/i386 -
lR
util.o:util.c:(.text+0x221): undefined reference to `dpotrf_'
util.o:util.c:(.text+0x1189): undefined reference to `dtrtri_'
collect2: ld returned 1 exit status
ERROR: compilation failed for package 'curves2'
* removing
'C:/Users/z4432045/AppData/Local/Temp/RtmpGRtc6x/Rinst2e7d684a/curves
2'
ERROR
Installation failed

C:\Users\z4432045>

Reply Share ›

Rob J Hyndman Mod ➔ Roger • 3 years ago

When the package does not install, almost always the error messages provided will tell you why. You need to read them. All those warnings point to problems in your C code.

1 Reply Share ›

Tim • 2 years ago

Dear Sir,

thank you for the summary provided above,
I still experience a technical difficulty.

I installed the package author version and the installer modified the path.

I created a directory C: MyRpackages

in this directory is the folder "LGP data" as created by R skeleton-function.

I made sure i was in this directory, unfortunateley when using the "Rcmd build --binary LGP data" command it does not recognize the command.

Someone in the above comments also had this trouble, but i did check the path as you recommended.
If I type path in the DOS command window it gives the following:"PATH=c:\Rtools\bin;c:\Rtools\perl\bin;c:\Rtools\MinGW\bin;C:WINDOWS\s
I think this is what it should say, no ?

Any help would be much appreciated,

Thanks in advance

Reply Share ›

Rob J Hyndman Mod → Tim • 2 years ago
Your path does not include where the R binary files are stored.

Reply Share ›

Tim • 
My apologies, I overlooked that.

Thanks for your help & patience with stupid questions

:-)

It works fine now

Kind Regards

Reply Share ›

Nipesh Bajaj • 2 years ago
Dear sir, I am also having problem in building my package

1. I have created a folder in C, naming R_PackageBuild
2. In R console I supplied following codes:
> setwd("c:/R_packageBuild")
> package.skeleton("trial1",namespace = TRUE, code_files = "f:/trial.r")

Now a folder naming 'trial1' has been created with all package information. I have modified the 'man' folder.

Now I opened cmd. There I have written followings:
cd C:\R_PackageBuild
Rcmd build --binary trial1

But following error pop up:
Error: unexpected symbol in "tools:::.test_load_package('trial1',....)"
Execution halted
ERROR: loading failed

Can you please favor me some suggestion how can I fix this error.

Thank you very much for your time.

Reply Share ›

Rob J Hyndman Mod → Nipesh Bajaj • 2 years ago
It looks like there is a weird symbol in your package. Most likely you haven't completed editing the Rd files.

Reply Share ›

Nipesh Bajaj • 
Thanks Rob for your point. However still I could not find out where I

have done wrong. In file code_files (i.e. the 'trial.r' file), there is only a function:
fn1 <- Vectorize(function(x,y,z) {
return(x + y +z)
}, SIMPLIFY = TRUE)

Once I run the package.skeleton() function, it creates a folder with name trial1, in the working directory. There is man folder and inside that folder there are 2 files with name, 'fn1' & 'trial1-package'. I have modified the contents of those 2 files as follows:

****************** for 'fn1':
\name{fn1}
\alias{fn1}

\title{
A function.
}

see more

Reply Share ›

Rob J Hyndman Mod ➔ Nipesh Bajaj • 2 years ago
I've no idea. This is not an R help service.
Reply Share ›

Nipesh Bajaj • [illegible]
okay, no probs
Reply Share ›

Krusty The Klown • 2 years ago
Hi, I'm facing some problems with building an R package under Windows 7. When I check the package, this is the message from MS Dos:

Warning message:
In normalizePath(path.expand(path), winslash, mustWork) :
path[1]="C:/Programmi/R/R-2.13.0/src/library/ForImp.Rcheck": Accesso negato
Warning in normalizePath(path.expand(path), winslash, mustWork) :
path[1]="C:/Programmi/R/R-2.13.0/src/library/ForImp.Rcheck": Accesso negato
Warning in normalizePath(path.expand(path), winslash, mustWork) :
path[2]="C:/Programmi/R/R-2.13.0/src/library/ForImp.Rcheck": Accesso negato
* installing *source* package 'ForImp' ...
Error in normalizePath(path.expand(path), winslash, mustWork) :
path[1]="./DESCRIPTION": Accesso negato
ERROR: installing package DESCRIPTION failed for package 'ForImp'
* removing 'C:/Programmi/R/R-2.13.0/src/library/ForImp.Rcheck/ForImp'

Any idea on what it means?

Thanks,
KtK
Reply Share ›

Krusty The Klown • [illegible]
Guys, I've solved the problem! They were due to... the non-operative Windows 7 system (a matter of paths & their translation from English to Italian).
Thx,
KtK
Reply Share ›

Steven Mosher • 2 years ago

Thanks for all your help. I used your instructions to build my first package ( see my blog) and I'm slowly slouching toward submitting to CRAN. I have a few questions. I've read all the manuals, sometimes they are a bit dense, so here are my questions.

1. I get warnings about data objects that are present in the manual but not in the code. They dont need to be in the code. how do I remove them, or will CRAN accept with warnings?

2. I built for win 64, how do I build for both 32 and 64. My package is pure R, no other source

3. I want to include demos. This entails a demo folder and an 00index file. Where do I put that index file?

I've also got some questions about submitting to CRAN, but for now lets look at those.

Reply Share ›

Steven Mosher •

Well, I answered some of my questions.

1. When R builds a .Rd file for a data object they put the following in for usage \usage{data(yourObject)}
That causes a warning. \usage{yourObject} fixes that.
Not sure why that is. Perhaps because I had lazyData set to FALSE.

2. no answer yet

3. the 00Index file goes in the 'demo' subdirectory.
the "name" of the demo should not have an R extension.

Reply Share ›

Rob J Hyndman Mod ➔ Steven Mosher • 2 years ago

CRAN won't accept a package if there are any warnings, so you need to fix them.

1. I don't understand why your change would fix the problem, or why there would be a problem with \usage{data(yourObject)}. That's what I use in my Rd files for data objects. I also use lazyData set to "yes".

2. You don't need to worry about it. CRAN will build for all operating systems. Just upload the tar.gz file to the CRAN incoming directory. (That is, not the binary build.)

3. I've never put demos in my packages, so I don't know.

Reply Share ›

Ludo • 2 years ago

just came across this post, liked it. But the link to Rtools seems outdated. It is now on CRAN; eg. http://cran.freestatistics.org...

Reply Share ›

Rob J Hyndman Mod ➔ Ludo • 2 years ago

Thanks Ludo. The link is now fixed.

Reply Share ›

Maria Antonietta • a year ago

Hi,
I have a problem when i execute the command "R CMD check". You can see the following error log that this command returns to me:

* checking PDF version of manual ... WARNING
LaTeX errors when creating PDF version.

This typically indicates Rd problems.
LaTeX errors found:
! LaTeX Error: File `inconsolata.sty' not found.

Type X to quit or <return> to proceed,
or enter new name. (Default extension: sty)

! Emergency stop.
<read *="">

l.267

! ==> Fatal error occurred, no output PDF file produced!

see more

1 Reply Share ›

Maria Antonietta • a year ago
Hi,
at the end I found the solutions to my problem. I must install the inconsolata package from the "MIKtex Package Manager": Start in the Start Menu item for MikTeX 2.8,

and find the "package manager" item. Run it, and choose to install the

"inconsolata" package.Now, the check is OK!!
Bye,
mery
Reply Share ›

cmmm7031 • a year ago
Hi,

How Upload the tar.gz le to
ftp://CRAN.R-project.org/incom...
Carlos
Reply Share ›

Rob J Hyndman Mod ➔ cmmm7031 • a year ago
Use ftp software such as FileZilla
Reply Share ›

cmmm7031 • a year ago
Thank you, Rob

Help me, please

What happened?[To Parent Directory]
19.04.2012 03:02 2632 00check.log
19.04.2012 03:02 406 00install.out
19.04.2012 03:02 <dir> examples_and_tests
19.04.2012 03:02 117515 TestSurvRec_1.0.zipHow, Do I submission "my package" in CRAN incoming?
what is the procedure?
</dir>
Reply Share ›

Josh Bowden • a year ago
Hi,
How do I link to specific windows libraries? I want to include a Lapack function from Intel MKL, for example dgeqrf(). What lines would I need in the Makevars.win file (and do I need Linux libraries or Windows DLLs or static libs?
Reply Share ›

Josh Bowden ➔ Josh Bowden • a year ago

Looks like I found an answer that works:
- Use Windows librarys.- Add something like the following for using Intel MKL to Makevars.win :PKG_LIBS = $(shell "${R_HOME}/bin${R_ARCH_BIN}/Rscript.exe" -e "Rcpp:::LdFlags()") -L$(MKLROOT)/lib/ia32 -lmkl_rtPKG_CPPFLAGS = -m32 -I $(MKLROOT)/include(although, I put in the full path instead of $(MKLROOT)Compile with R CMD INSTALL...Quite simple once you have got rid of the 300 other possibilities.

Reply Share ›

Dissanayake • 9 months ago

how to clean up new r package by ;'rm rf .....'

Reply Share ›