

# Building R from source on MACs and PCs

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- MAKE SURE YOU READ THE RELEVANT SECTION BELOW DEPENDING ON THE KIND OF MACHINE YOU HAVE AND THEN RELIGIOUSLY FOLLOW THE DIRECTIONS AND DON'T TRY ANYTHING FUNNY
- TO BE ON THE SAFE SIDE, WRITE EVERY STEP YOU TOOK, EVERY COMMAND YOU TYPED ON A PIECE OF PAPER SO THAT IF YOU ARE STUCK I CAN DO A LITTLE POST-MORTEM. IF DON'T HAVE THIS PIECE OF PAPER WITH YOUR ACTIVITY HISTORY I MIGHT BE OF VERY LITTLE HELP AND YOU MIGHT HAVE TO GO THROUGH THE FOLLOWING STPES OVER AND OVER AGAIN.
- THE AUTHOR OF THIS DOCUMENT HOLDS NO RESPONSIBILITY FOR ANY MISHAP / MISERY / GRIEF / LOSS-OF-DATA / HEADACHE / WHATEVER.
- For MACs (OS X 10.4):

This part of this document is based on <http://wiki.urbanek.info/index.cgi?TigerR>.

- Install X11 from the Tiger DVD along with the Xcode Tools 2.0.
- Now open a window of the Terminal application and use it to type every command mentioned below. Note every command is on a separate line. Also, any command starting with sudo may ask you for root or the administrator password.
- Install gfortran4 from the HPC pages <http://hpc.sourceforge.net/> but make sure you choose the **Panther** (not Tiger!!!) version of the g95 (as of now it's g95-bin.tar.gz). NOTE, APPARENTLY THE FINK G95 COMPILER IS BROKEN, SO USE THE PANTHER G95 BINARY MENTIONED ABOVE. Given you downloaded it on your desktop, unpack it by typing the following in the Terminal:

```
cd /
sudo tar xvzf ~/Desktop/g95-bin.tar.gz
```

- Download R source code, i.e., a file called R-\*. \*. \*.tar.gz (where the "\*" are replaced by the then current version numbers of R) from any USA-based site listed on the CRAN section of <http://www.r-project.org/> and put it on your desktop, say its called R-2.1.1.tar.gz. Now type:

```
cd ~/Desktop
tar xvzf R-2.1.1.tar.gz
```

- Now configure R, i.e., type:

```
cd R-2.1.1
./configure --with-aqua --with-blas='-framework vecLib' --with-lapack F77=gfortran
```

- Now make and install R:

```
make
sudo make install
sudo chmod -R g+w /Library/Frameworks/R.framework
```

- Note the make might fail with error message of the following sort:

```
Error in dyn.load(x, as.logical(local), as.logical(now)) :
  unable to load shared library '/Builds/R-2.1.1/library/grDevices/libs/grDevices.so':
dlopen(/Builds/R-2.1.1/library/grDevices/libs/grDevices.so, 6): Symbol not found: __cg_jpeg_resync_to_restart
Referenced from: /System/Library/Frameworks/ApplicationServices.framework/Versions/A/Frameworks/ImageIO.framework/Versions/A/ImageIO
Expected in: /usr/local/lib/libJPEG.dylib
```

- If it does halt as mentioned above do the following for all the offending libraries such as `libjpeg`, `libtiff`, `libpng`. In the following, I describe what to do for `libjpeg`, do similar things for the other libraries:

```
cd /usr/local/lib
sudo mv libpng.dylib libpng.dylib.moved
```

- After having done the above rerun:

```
make
sudo make install
sudo chmod -R g+w /Library/Frameworks/R.framework
```

- It should work fine now, i.e., you should be able to invoke R from the command line if you type R in the terminal, if it does not come see me with the error messages.

- **For PCs (Windows 2000 and XP):**

This part of this document is based on the "R Installation and Administration" document found in the manual section of <http://www.r-project.org/>.

- We are going to assume that you have either Emacs or XEmacs installed on your machine.
- We are going to assume that you do have Winzip installed on your computer.
- In the following, we are going to use the words directory and folder interchangeably.
- First make sure you know how to change the Path environment variable on your Windows 2000 or XP. This is how do it:

- \* From the desktop right click My Computer and click properties.
- \* In the System Properties window click on the Advanced tab.
- \* In the Advanced section click the Environment Variables button.
- \* Finally, in the Environment Variables window highlight the Path variable in the Systems Variable section and click edit. Suppose your present value of Path looks like the following. Note, each different directory is separated with a semicolon as shown below:

```
C:\Program Files;C:\Winnt;C:\Winnt\System32
```

- \* Now to add a directory say C:\Blah\Foo\Bar\Whatever\All Right Enough just add the directory name, as before, to the end of the present value like so (note the separating semicolon!):

```
C:\Program Files;C:\Winnt;C:\Winnt\System32;C:\Blah\Foo\Bar\Whatever\All Right Enough
```

- \* NOTE THERE ISN'T ANY SPACE BEFORE AND AFTER THE SEMICOLONS. ALSO, WHEN YOU ARE ADDING A DIRECTORY TO THE PATH AS ABOVE MAKE SURE YOU DO NOT TYPE JUST COPY AND PASTE THE DIRECTORY NAME (FROM THE WINDOWS EXPLORER ADDRESS BAR, IF YOU WANT), NOT TYPING WILL AVOID LOT OF PROBLEMS.
- \* Now hit OK a couple of times to make sure this change is registered.

- Go to <http://www.murdoch-sutherland.com/Rtools/> and read the directions and do the following:

- \* Download <http://www.murdoch-sutherland.com/Rtools/tools.zip> and save it on the Desktop
- \* Double click on the file and use WinZip to unzip the above file extract the contents: it will be just be a folder called tools by default, move it to C: from Desktop, i.e., you should have a folder C:\tools

- \* Add `C:\tools\bin` to your Path environment variable following the steps described above
- \* Search for a file called `cygwin1.dll` and you should get two instances of this file (if you have cygwin installed on your machine), namely,

```
C:\cygwin\cygwin1.dll and
C:\tools\cygwin1.dll.
```

Rename the copy `C:\cygwin\cygwin1.dll` to `C:\cygwin\cygwin1.dll.moved`.

- Now, you will need the Windows port of perl5. A package containing this is available from <http://www.activestate.com/Products/ActivePerl/>. Go to that page and hit download, once you are looking at the files-to-be-downloaded-list choose the MSI (MicroSoft Installer) file which corresponds to the latest release, which is usually the first MSI file from the top.
- You need a recent version of the MinGW port of gcc from <http://www.mingw.org/download.shtml>.
  - \* Go there, and download the file called `MinGW-4.1.0.exe` or the most recent version of MinGW. *Do not get files corresponding to either MinGW Utilities or MinGW Runtime.* Save this file and follow the directions of the in-built installer which kicks-off after you click on it. This would install MinGW.
  - \* Add `C:\MinGW\bin` to your Path environment variable following the steps described above. **Make sure this directory, i.e., `C:\MinGW\bin` comes after the `C:\tools\bin` which you added to Path before.**

- Pull up the Run command dialog box from Windows start menu. Type `cmd` on the Run command dialog box and hit return. This should open a Command window, which should look like a bland black window with a long prompt showing which directory you are in. Note this window is not a cygwin command window, its the Windows command window. NOW USE THIS WINDOW TO TYPE EVERY COMMAND MENTIONED BELOW. NOTE EVERY COMMAND IS ON A SEPARATE LINE.

- Use Windows explorer and create a new folder called `R_HOME` in `C:` and type in the command window:

```
cd C:\R_HOME
```

From this point onwards, do not type anything else in the command window unless otherwise mentioned below. So, in particular, we are going to assume that you are in the directory `C:\R_HOME` unless otherwise specified.

- Now download the R source files.
  - \* Go to <http://www.r-project.org/>, click on the CRAN link on the left pane and then choose a US-based mirror from the bottom of the right pane and click on the link. Now click and download the file `R-*.*.*.tar.gz` with the "\*" replaced by the then current version of R. Lets say, the filename reads `R-2.1.1.tar.gz`.
  - \* Move the `R-*.*.*.tar.gz` file to `C:\R_HOME`. *Do not use WinZip to do anything with this file!*
  - \* Now type the following in the command window:
 

```
tar xvzf R-2.1.1.tar.gz
```
  - \* The above should create a directory called `C:\R_HOME\R-2.1.1`
- Now type in your browser address bar:
 

```
http://www.murdoch-sutherland.com/Rtools/R_Tcl.zip
```

 which should prompt to save a file called `R_Tcl.zip`. Save this file to `C:\R_HOME\`. Now issue the following command:

```
unzip R_Tcl.zip
```

- Open up the file `R_HOME\R-2.1.1\src\gnuwin32\MkRules` in Emacs/X-Emacs. Edit this file as directed below. Beware: the file `MkRules` contains tabs and some editors (e.g. WinEdt) silently remove them, use Emacs or XEmacs instead. Before editing, the two lines you would be changing should look like the following:

```
HELP = YES
TCL_HOME = $(RHOME)/Tcl
```

Below is what you should have after editing. Search for the words `HELP` and `TCL_HOME` in this file and change the above lines to the following:

```
HELP = NO
TCL_HOME = C:/R_HOME/Tcl
```

- Go to <http://www.murdoch-sutherland.com/Rtools/> and download the file `iconv.zip` and save it in `C:\R_HOME`. Now type the following in the command window:

```
unzip iconv.zip
mv iconv.dll R-2.1.1\src\gnuwin32\unicode
```

- Type the following in the command window:

```
cd C:\R_HOME\R-2.1.1\src\gnuwin32\
make
```

- This will take some time, so relax.
- YOU MIGHT GET THE FOLLOWING TYPE OF ERROR MULTIPLE TIMES, THERE'S A SMALL GLITCH SOMEWHERE. FOR THE TIME BEING HERE IS THE PROBLEM AND THE SOLUTION. You might see `make` failing with an error message in essence saying the directory:

```
C:\R_HOME\R-2-1.1\library\***\inst,
```

where `***` could be `base`, `grid`, `utils`,..., could not be found. Just note the path, say it is, `C:\R_HOME\R-2-1.1\library\base`. Go to the that directory using windows explorer; create a blank new folder called `inst` inside it; then rerun `make`, i.e., type the following in the command window:

```
make
```

You might have to repeat the above steps multiple times for different directories such as `base`, `tools`, `stats`, `grid` etc., please be patient and careful.

- After this add `C:\R_HOME\R-2-1.1\bin` to your Path environment variable following the steps described above.
- You should be all set at this point. To check whether things work open up a new command window and type `R` and see what you get, guess what, `R` should start up and the version number should read `2.1.1`, if not you have problem(s). Come see me with your step-by-step activity history.