Installing and Maintaining R Packages

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About This Presentation

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R Extensions

- R is great, but limited.
- Has a great package extension system.
- R doesn't do what you want? Make it!

"*. . . if I dont know how to fix it, I can hire somebody else to fix it for me.*" — Matt Dowle, developer of the `data.table` package.

Terminology

- We call the extension a *package*.
- *Packages* go into a *library*.
- **This is dumb and confusing, but there's nothing we can ever do about it.**

Example Confusion

- I wrote a library.
- I put the library in a package.
- I install the package . . . into a library.
- I load the package with `library()` ???

BOOM

Installing R Packages

```
1 install.packages("devtools")
```

```
1 install.packages("devtools", lib="some/place/on/disk")
```

```
1 R CMD INSTALL devtools_1.6.tar.gz -l /some/place/on/disk
```

Repositories

- This basically assumes you're using CRAN.
- Lots of exciting development is happening outside of CRAN these days.
- Other binary package repositories: Bioconductor, R-forge (Windows)
- Other source repositories: GitHub, Bitbucket, ...

GitHub Binaries?

Karl Broman @kwbroman · Sep 27

.@hadleywickham @millerdl It would be great to have a service that would complie windows/mac binaries of #rstats pkgs on github.

Reply Retweet Favorite More

Hadley Wickham
@hadleywickham

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@kwbroman @millerdl agreed. Plans are in motion

Installing Packages from Source

To install packages from source, you need some compilers:

- **Windows**: Install Rtools.
- **Mac**: Install Xcode from the app store, possibly some other things from here. If you need OpenMP, god help you.
- **Linux and FreeBSD**: You're good to go.

Installing R Packages

```
1 library(devtools)
2 install_github("hadley/devtools")
```

Devtools Package Install Functions

install_bitbucket	install_github	install_svn
install_deps	install_gitorious	install_url
install_git	install_local	install_version

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Maintinaing R Packages

- Installing and managing R and its extensions can be pretty complicated...
- If printed, the R Installation and Administration manual would run over 100 pages.
- We don't have that kind of time.

Highlights

- Problem: you want to maintain separate package libraries.
- You can always specify which library a package loads from:
  `library("foo", lib.loc="mylib/")`
- But what if you have a lot of packages to load...

Highlights

- `.libPaths()` "gets/sets the library trees within which packages are looked for".
- So if you have package `foo` in libraries `A` and `B`, setting `.libPaths(B)` will put `B` in the search path before `A`.
- Meaning package `foo` will load from library `B` (and R will look there first even if it's not installed there).
- `.Library` and `.Library.site` also exist, but are more specialized.
- `update.packages()` also exists.

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An Appeal: Write a Package

- Are you interested in reproducible research?
- Having functioning code a year from now?
- Collaboration?

Put your code in an R package.

Package Structure

R packages: a place to put stuff

```
.
├── data/
├── demo/
├── inst/
├── man/
├── R/
├── src/
├── tests/
├── vignettes/
├── DESCRIPTION
└── NAMESPACE
```

Package Development Resources

- Writing R Extensions (R Core)
- R package primer (Karl Broman)
- R packages (Hadley Wickham)
- Developing Packages with RStudio (Josh Paulson)
- Packages on CRAN, Bioconductor, GitHub, R-Forge, ...

Git and GitHub Resources

Publishing to GitHub is very easy. . . assuming you use git.

- git/github guide (Karl Broman)
- Try Git: Code School
- GitHub Bootcamp

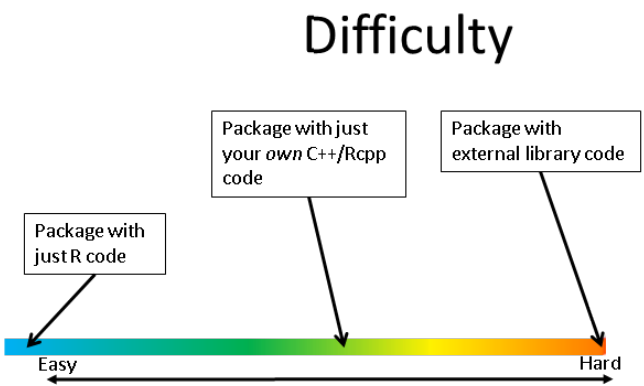
3 Writing R Packages
- Package Structure
- Getting on the GitHub
- Getting on the CRAN

The CRAN

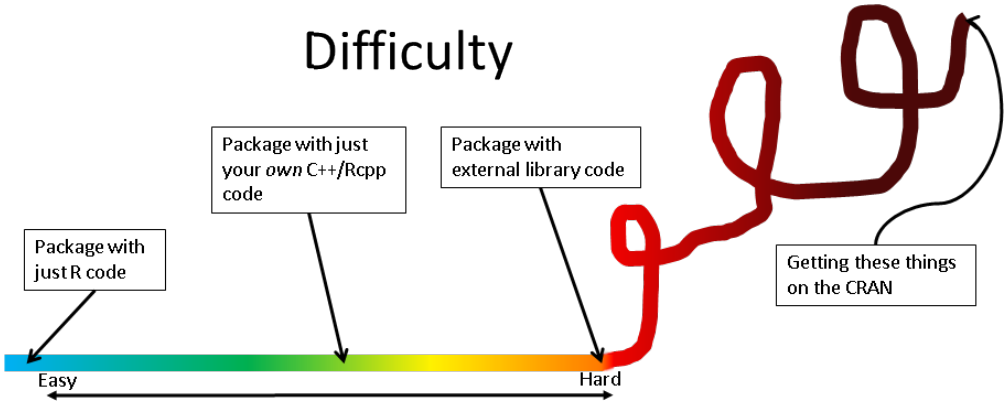
Publishing to CRAN comes at varying degrees of difficulty, largely depending on how A CERTAIN SOMEONE is feeling that day.

- All submissions must pass `R CMD check`.
- You must read, abide by, and acknowledge the CRAN Repository Policy (it changes from time to time).
- Submit via the web form.
- Receive serenity in the knowledge that they will yell at and belittle you, but it doesn't make you a bad person. Just do what they say and move on with your life.

Package Development Difficulty



Package Development Difficulty



Getting on the CRAN

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Summary

- R packages are great!
- You can easily maintain and use several libraries (e.g., multiple binary versions of packages)
- Making an R package isn't scary!
- Submitting it to CRAN is!

Thanks for coming!

Questions?

I'm on the internet!

twitter:	@wrathematics
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blog:	librestats.com