Writing R packages
Tools for Reproducible Research

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Why write an R package?

- To distribute R code and documentation
- To keep track of the misc. R functions you write and reuse
- To distribute data and software accompanying a paper.
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A simple example: RSkittleBrewer

Skittle-themed color schemes for R graphics with RSkittleBrewer!

Thu 6 March 2014 | """" (permalink)

Choosing the perfect set of colors for a plot is hard. But people have thought a lot about this problem, and there are solutions! If you’re an R user looking for publication-quality color schemes that are backed by lots of scientific research, check out RColorBrewer, or use the color schemes in ggplot2.

If, on the other hand, you’re looking for a color scheme that reminds you of a bag of Skittles, check out RSkittleBrewer. This is a tiny R package I wrote yesterday to generate vectors of valid R color names for certain Skittle flavors. You can also generate a vector of M&M colors, if (like me) you’re more into chocolate.

The code is on GitHub. Here’s how you use it:

```r
library(devtools)
install_github("RSkittleBrewer", "alyssafrazee")
original = RSkittleBrewer("original")
tropical = RSkittleBrewer("tropical")
wildberry = RSkittleBrewer("wildberry")
mm = RSkittleBrewer("mm")
```

And if you want to see how the colors actually look, you can make a plot:

```r
plotSkittles()
```

It will look like this:

![Color schemes for Skittle-themed graphics](alyssafrazee.com/RSkittleBrewer.html)
R package contents

RSkittleBrewer/

DESCRIPTION
NAMESPACE

R/RSkittleBrewer.R
R/plotSkittles.R
R/plotSmarties.R

man/RSkittleBrewer.Rd
man/plotSkittles.Rd
man/plotSmarties.Rd
Package: RSkittleBrewer
Version: 1.1
Author: Alyssa Frazee
Maintainer: Alyssa Frazee <afrazee@jhsph.edu>
License: MIT + file LICENSE
Title: fun with R colors
Description: for those times you want to make plots with...
URL: https://github.com/alyssafr请教ee/RSkittleBrewer
NAMESPACE file

export(RSkittleBrewer)
export(plotSkittles)
export(plotSmarties)
\name{RSkittleBrewer}  
\alias{RSkittleBrewer}  
\title{Candy-based color palettes}  
\description{Vectors of colors corresponding to different candies.}  
\usage{RSkittleBrewer(flavor = c("original", "tropical", "wildberry", "M&M", "smarties"))}  
\arguments{  
  \item{flavor}{Character string for candy-based color palette.}  
}  
\value{Vector of character strings representing the chosen set of colors.}  
\examples{  
plotSkittles()  
plotSmarties()  
}  
\keyword{hplot}  
\seealso{ \code{\link{plotSkittles}}, \code{\link{plotSmarties}} }
Building, installing, and checking

```r
R CMD build RSkittleBrewer
R CMD INSTALL RSkittleBrewer_1.1.tar.gz
R CMD check RSkittleBrewer_1.1.tar.gz

R CMD check --as-cran RSkittleBrewer_1.1.tar.gz

R CMD INSTALL --library=~/.Rlibs RSkittleBrewer_1.1.tar.gz
# (~/.Renviron file contains R_LIBS=~/.Rlibs)

# On windows:
R CMD INSTALL --build RSkittleBrewer_1.1.tar.gz

# also consider (within R):
library(devtools)
build("/path/to/RSkittleBrewer")
build("/path/to/RSkittleBrewer", binary=TRUE)
```
RSkittleBrewer <-
...
# build package documentation
doc:
    R -e "devtools::document()"
.Rbuildignore

Makefile
fun with R Colors
=================

If you want high-quality, scientifically-researched color schemes for your R plots, check out [RColorBrewer](http://cran.r-project.org/web/packages/RColorBrewer). If you want your plots to be colored the same way as packs of Skittles (or M&Ms), then this package (RSkittleBrewer) is the way to go.

```
### install
with `devtools`:

```
devtools::install_github('RSkittleBrewer', 'alyssafrazee')
```

### use
There are only three functions in this package.

Call `RSkittleBrewer` on a flavor to get a vector of R color names that correspond to that Skittle flavor.
...
That's it!
Include *vignettes* to show how to use your package.

It's simplest to use R Markdown.
- Create a `vignettes/` subdirectory.
- Place a `.Rmd` file there.
- The name of the file becomes the name of the vignette.

Include the following in the `.Rmd` file's YAML header:

```yaml
output: rmarkdown::html_vignette
vignette: >
  %VignetteIndexEntry{Intro to RSkittleBrewer}
  %VignetteEngine{knitr::rmarkdown}
  \usepackage[utf8](inputenc)
```

Load the package in an initial chunk

```r
library(RSkittleBrewer)
```
Package vignettes

- In the DESCRIPTION file, include:
  
  `Suggests: knitr, rmarkdown`
  
  `VignetteBuilder: knitr`

- The following lists the vignettes for a package and then opens a selected vignette.

  ```r
  library(RSkittleBrewer)
  vignette(package="RSkittleBrewer")
  vignette("RSkittleBrewer", "RSkittleBrewer")
  ```
Optional stuff

- **NEWS** file describing changes in each version of the package.
- **inst/CITATION** file describing how to cite your package.
- **inst/doc/** directory any sort of misc. documentation (e.g., pre-compiled computationally heavy vignettes)
- **data/** directory containing data
- **src/** directory containing C/C++/Fortran code
- **demo/** directory with demonstrations (like vignettes, but to be executed in real-time).
- **tests/** and/or **inst/tests/** containing tests.
devtools

Get to know the devtools package.

▶ dev_mode()
▶ load_all()
▶ install_github(), install_bitbucket, ...
▶ document()
▶ build()
▶ check()
▶ check_doc()
▶ run_examples()
▶ test() (next time)
Summary

- R packages really aren't that hard.
- R packages are really useful.
  - Distributing software and data
  - Organizing code for a paper
  - Organizing your misc. R functions
- Look at others' packages, and learn from them.
- Adopt the tools in the devtools package.