NIH Library Classes: Packages

## cowplot Package

The [cowplot](https://wilkelab.org/cowplot/) package is a simple add-on to ggplot. It provides various features that help with creating publication-quality figures, such as a set of themes, functions to align plots and arrange them into complex compound figures, and functions that make it easy to annotate plots and or mix plots with images.

# install.packages("cowplot")  
library(cowplot)

## forcats Package

The goal of the [forcats](https://forcats.tidyverse.org/) package is to provide a suite of tools that solve common problems with factors, including changing the order of levels or the values. Some examples include:

* [fct\_reorder()](https://forcats.tidyverse.org/reference/fct_reorder.html): Reordering a factor by another variable.
* [fct\_infreq()](https://forcats.tidyverse.org/reference/fct_inorder.html): Reordering a factor by the frequency of values.
* [fct\_relevel()](https://forcats.tidyverse.org/reference/fct_relevel.html): Changing the order of a factor by hand.
* [fct\_lump()](https://forcats.tidyverse.org/reference/fct_lump.html): Collapsing the least/most frequent values of a factor into “other.”

You can learn more about each of these in [vignette(“forcats”)](https://forcats.tidyverse.org/articles/forcats.html). If you’re new to factors, the best place to start is the chapter on [factors](https://r4ds.hadley.nz/factors) in R for Data Science.

# install.packages("forcats")  
library(forcats)

## gapminder Package

Excerpt of the [Gapminder](http://www.gapminder.org/data/) data. The main object in this package is the gapminder data frame or “tibble”. There are other goodies, such as the data in tab delimited form, a larger unfiltered dataset, premade color schemes for the countries and continents, and ISO 3166-1 country codes. The gapminder data frame include six variables, ([Gapminder.org documentation page](http://www.gapminder.org/data/documentation/)).

## **gitcreds Package**

[gitcreds](https://gitcreds.r-lib.org/) allows users to query git credentials from R, that allows you to use the same credentials in command line git, R and the RStudio IDE., etc. Users can set their GitHub token once and use it everywhere.

## ggrepel Package

[ggrepel](https://ggrepel.slowkow.com/index.html) provides geoms for [ggplot2](https://ggplot2.tidyverse.org/) to repel overlapping text labels:

* [geom\_text\_repel()](https://ggrepel.slowkow.com/reference/geom_text_repel.html): draws a rectangle underneath the text, making it easier to read. The text labels repel away from each other and away from the data points.
* [geom\_label\_repel()](https://ggrepel.slowkow.com/reference/geom_text_repel.html): text labels repel away from each other, away from data points, and away from edges of the plotting area

## ggridges Package

Supports the creation of ridgeline plots in ggplot2. Ridgeline plots are partially overlapping line plots that create the impression of a mountain range. They can be quite useful for visualizing changes in distributions over time or space. The ggridges package provides two main geoms:

1. geom\_ridgeline: Takes theheight values directly to draw ridgelines
2. geom\_density\_ridges: first estimates data densities and then draws those using ridgelines

## GGally Package

[GGally](https://ggobi.github.io/ggally) extends ggplot2 by adding several functions to reduce the complexity of combining geoms with transformed data. Some of these functions include a pairwise plot matrix, a scatterplot plot matrix, a parallel coordinates plot, a survival plot, and several functions to plot networks.

## **hms Package**

The [hms](https://hms.tidyverse.org/) package provides a simple class for storing durations or time-of-day values and displaying them in the hh:mm:ss format. This class is intended to simplify data exchange with databases, spreadsheets, and other data sources. Attributes of the hms package include:

* Stores values as a numeric vector that contains the number of seconds since midnight
* Supports construction from explicit hour, minute, or second values
* Supports coercion to and from various data types, including POSIXt
* Can be used as column in a data frame
* Based on the difftime class
* Values can exceed the 24-hour boundary or be negative

## Knitr

[knitr](http://yihui.name/knitr/) is a general-purpose tool for dynamic report generation in R using Literate Programming techniques. Inspired by [Sweave](https://en.wikipedia.org/wiki/Sweave), the **knitr** package was designed to be a transparent engine for dynamic report generation with R, and combine features in other add-on packages into one package.

# install.packages("knitr")  
library(knitr)

## nlme Package

The [nlme: Nonlinear Mixed-Effects Models](https://www.rdocumentation.org/packages/nlme/versions/3.1-159/topics/nlme) package fits a nonlinear mixed-effects model in the formulation described in Lindstrom and Bates (1990) but allowing for nested random effects. The within-group errors are allowed to be correlated and/or have unequal variances. We are simply using it for the [oxboys](https://rdrr.io/cran/mlmRev/man/Oxboys.html) dataset.

## OpenIntro Package

The [OpenIntro](http://openintrostat.github.io/openintro/) package includes the data and functions for the [OpenIntro Statistics](https://www.openintro.org/book/os/) textbook. The package also contains custom plotting functions for reproducing book figures, and the datasets used in [OpenIntro labs](openintro.info/stat/labs.php?stat_lab_software=R).

## Palmer Penguins

The goal of [palmerpenguins](https://allisonhorst.github.io/palmerpenguins/) is to provide a great dataset for data exploration & visualization, as an alternative to the iris dataset.

### portalr Package

The [portalr](https://weecology.github.io/portalr/) package provides collection of basic functions to summarize the Portal project data on rodents, plants, ants, and weather at our long-term field site in the Chihuahuan Desert. The data begin in 1977 and are continuously updated today. There are functions to summarize rodent abundance, biomass, or energy and by site, plot, or treatment type. There are functions to summarize the weather data collected from our automated weather stations and plant data that is collected each summer and fall. You need to set default data folder using:

# install.packages("portalr")  
library(portalr, use\_default\_data\_path('../lsc527-data-raw/'))

## RColorBrewer

[Cynthia Brewer](https://en.wikipedia.org/wiki/Cynthia_Brewer), a geographer and color specialist, created sets of colors for print and the web and they are available in the add-on package [RColorBrewer](https://cran.r-project.org/package=RColorBrewer). You will need to install and load this package to use.

## Report

Primary goal of [report](https://easystats.github.io/report/) is to bridge the gap between R’s output and the formatted results contained in your manuscript. It automatically produces reports of models and data frames according to **best practices** guidelines (e.g., [APA](https://apastyle.apa.org/)’s style), ensuring **standardization** and **quality** in results reporting.

The report package works in a two step fashion. First, you create a report object with the [report()](https://easystats.github.io/report/reference/report.html) function. Then, this report object can be displayed either textually (the default output) or as a table, using [as.data.frame()](https://rdrr.io/r/base/as.data.frame.html). Moreover, you can also access a more digest and compact version of the report using [summary()](https://rdrr.io/r/base/summary.html) on the report object (Figure 1).

Figure 1: Report package workflow.

## R Markdown

R Markdown documents are fully reproducible. Use a productive [notebook interface](https://bookdown.org/yihui/rmarkdown/notebook.html) to weave together narrative text and code to produce elegantly formatted output.

# install.packages("rmarkdown")  
library(rmarkdown)

### svglite

[svglite](https://svglite.r-lib.org/) is a graphic device that is capable of creating SVG files from R graphics. SVG is a vector graphic format which means that it encodes the instructions for recreating a graphic in a scale-independent way. This is in contrast with raster graphics, such as PNG (as can be produced with the graphic devices in [ragg](https://ragg.r-lib.org/)), which encode actual pixel values and will get pixelated as you zoom in

# install.packages("svglite")  
library(svglite)

## Dow

## Tidyverse Package

The tidyverse is a collection of R [packages](https://www.tidyverse.org/packages) designed for data science. All packages share an underlying design philosophy, grammar, and data structures. Most importantly, the tidyverse collection of packages contains [ggplot](https://ggplot2.tidyverse.org/).

# install.packages("tidyverse")  
library(tidyverse)

── Attaching core tidyverse packages ──────────────────────── tidyverse 2.0.0 ──  
✔ dplyr 1.1.3 ✔ readr 2.1.4  
✔ ggplot2 3.4.3 ✔ stringr 1.5.0  
✔ lubridate 1.9.2 ✔ tibble 3.2.1  
✔ purrr 1.0.2 ✔ tidyr 1.3.0  
── Conflicts ────────────────────────────────────────── tidyverse\_conflicts() ──  
✖ dplyr::filter() masks stats::filter()  
✖ dplyr::lag() masks stats::lag()  
✖ lubridate::stamp() masks cowplot::stamp()  
ℹ Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors

## **usethis Package**

usethis is a [workflow package](https://usethis.r-lib.org/) that automates repetitive tasks that arise during project setup and development, both for R packages and non-package projects.