R Packages

Justin Post

What do we want to be able to do?

Data Science!

- Read in raw data and manipulate it
- Combine data sources
- Summarize data to glean insights
- Apply common analysis methods
- Communicate Effectively

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Where Do Our Objects & Functions Come From?

When you open R a few `packages` are loaded

- R package:

  - Collection of functions/objects/datasets/etc.
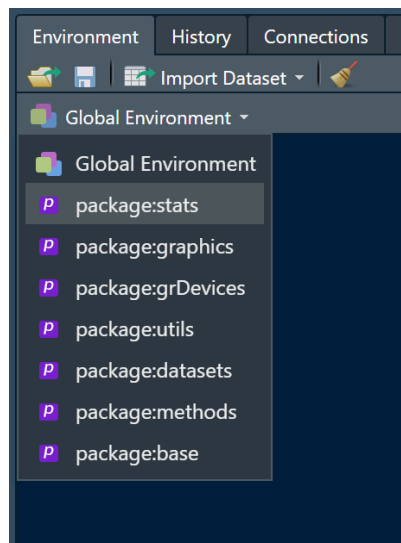
Where Do Our Objects & Functions Come From?

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- R package:

    - Collection of functions/objects/datasets/etc.

- Packages exist to do almost anything

    - List of CRAN approved packages
    - Plenty of other packages on places like GitHub!

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Where Do Our Objects & Functions Come From?

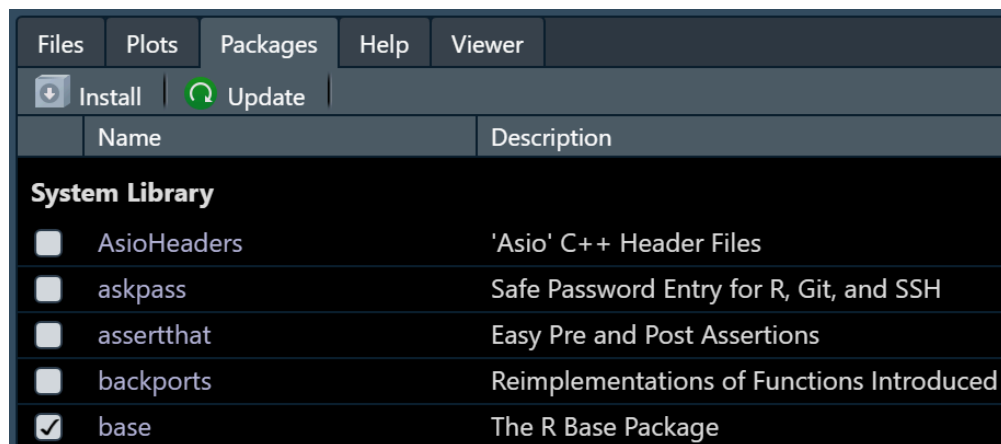- When you open R a few `packages` are loaded

- `base` package has `c()`, `data.frame()`, `list()`, ...

Installing an R Package

- First time using a package
  - Must **install package**
  - Can use code, menus, or Packages tab

```
install.packages("dplyr")
```

Accessing a Package in Your R Session

- Only install once!

- **Each session**: read in package using `library()` or `require()`

```r
library("dplyr")
```

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Accessing a Package in Your R Session

- Difference - if no package
  - `library()` throws an error
  - `require()` returns FALSE

```
library("notAPackage")
```

```
## Error in library("notAPackage"): there is no package called 'notAPackage'
```

```
require("notAPackage")
```

```
## Warning in library(package, lib.loc = lib.loc, character.only = TRUE,
## logical.return = TRUE, : there is no package called 'notAPackage'
```

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Setting Packages to Automatically Load

To load packages by default, access your `.Rprofile` file

- Add in the code

```
options(defaultPackages=c(getOption("defaultPackages"),
                          "mypackage1",
                          "mypackage2"))
```

See here for info on finding your `.Rprofile` file

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Accessing a Package in Your R Session

- See everything from a package:

```r
ls("package:dplyr")
```

```
##  [1] "%>%"               "across"            "add_count"
##  [4] "add_count_"        "add_row"           "add_rownames"
##  [7] "add_tally"         "add_tally_"        "all_equal"
## [10] "all_of"            "all_vars"          "anti_join"
## [13] "any_of"            "any_vars"          "arrange"
## [16] "arrange_"          "arrange_all"       "arrange_at"
## [19] "arrange_if"        "as.tbl"            "as_data_frame"
## [22] "as_label"          "as_tibble"         "auto_copy"
## [25] "band_instruments"  "band_instruments2" "band_members"
## [28] "bench_tbls"        "between"           "bind_cols"
## [31] "bind_rows"         "c_across"          "case_match"
## [34] "case_when"         "changes"           "check_dbplyr"
## [37] "coalesce"          "collapse"          "collect"
## [40] "combine"           "common_by"         "compare_tbls"
## [43] "compare_tbls2"     "compute"           "consecutive_id"
## [46] "contains"          "copy_to"           "count"
## [49] "count_"            "cross_join"
```

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Calling From a Library

- Call functions without loading full library with `::`

- If not specified, most recently loaded package takes precedent

```
#stats::filter(...) calls time-series function from stats package
dplyr::filter(iris, Species == "virginica")
```

```
##    Sepal.Length Sepal.Width Petal.Length Petal.Width   Species
## 1           6.3         3.3          6.0         2.5 virginica
## 2           5.8         2.7          5.1         1.9 virginica
## 3           7.1         3.0          5.9         2.1 virginica
## 4           6.3         2.9          5.6         1.8 virginica
## 5           6.5         3.0          5.8         2.2 virginica
## 6           7.6         3.0          6.6         2.1 virginica
## 7           4.9         2.5          4.5         1.7 virginica
## 8           7.3         2.9          6.3         1.8 virginica
## 9           6.7         2.5          5.8         1.8 virginica
## 10          7.2         3.6          6.1         2.5 virginica
## 11          6.5         3.2          5.1         2.0 virginica
## 12          6.4         2.7          5.3         1.9 virginica
## 13          6.8         3.0          5.5         2.1 virginica
## 14          5.7         2.5          5.0         2.0 virginica
## 15          5.8         2.8          5.1         2.4 virginica
##                                        5.3         2.3 virginica
                                         5.5         1.8 virginica
                                         6.7         2.2 virginica
                                         6.9         2.3 virginica
                                         5.0         1.5 virginica
```

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Quick R Example

Let's jump into R and see how to download a package that will allow us to create a `.pdf` file from our `.qmd`!

R Packages Recap

- Install packages first (download it)

  - Can do more than one at a time

- Load package with `require()` or `library()`

- Call a function without loading using `::`

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