R Essentials

Getting Started with R

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Agenda

- An overview
- Interface of RStudio
- Quickstart
- Useful functions

An overview

The characteristics of R

- Comparing to Matlab, SAS, SPSS: Free
- Comparing to Julia: Larger community
- Functional Programming

R in one sentence

Applying functions to objects. Greg Martain

R: core of computation

- Download from [https://cran.r-project.org/ (https://cran.r-project.org/)](https://cran.r-project.org/)

RStudio: the IDE

- Download from https://www.rstudio.com/products/rstudio/download [(https://www.rstudio.com/products/rstudio/download)](https://www.rstudio.com/products/rstudio/download)

Interface of RStudio

Four blocks

- Script
- Console
- Environment
- Multi-functional

Console tricks

- Using `Ctrl + L` for clearing
- Using Up and Down arrow checking executed scripts

Keyboard shortcuts

Using `Alt` + `Shift` + `K` for shortcuts.

Quickstart

Using <- for assignment

- = is OKAY, but <- is more common
- Using `Alt + -` to get <-

Using # for comments

In [1]:
```python
# Declaring objects

# Declaring function
```

Assignments in action

```
In [2]:   # Declaring objects
          my_favorite_star <- "Tom Cruise"
          my_lucky_number <- 24
          r_is_easy <- TRUE

          # Declaring function
          say_hello <- function(){
            return("Hello R!")
          }
```

Style guide

http://adv-r.had.co.nz/Style.html (http://adv-r.had.co.nz/Style.html)

Why is R Console keeps showing +?

The reason is that R is still expecting inputs from us.

```
In [3]:  #my_favorite_player <- "Steve Nash
         #
         #say_hello <- function(){
         #  return("Hello R!")
         #
         #help(print
```

2 ways to solve it

1. Complete your inputs
2. ESC

Printing objects or calling function

```
In [4]:  # Printing objects
         my_favorite_star
         my_lucky_number
         r_is_easy

         # Calling function
         say_hello()
```

'Tom Cruise'

24

TRUE

'Hello R!'

Useful functions

Using `rm()` to remove objects

```
In [5]:   rm(r_is_easy)
          #r_is_easy # Error
```

How to install packages

- `install.packages()`
- Do it once

How to import packages

- `library()`
- Do it every time

Function to query functions or data

```
In [6]:  #help(print) # ?print
         #help(cars) # ?cars
```

Function to show environment information

In [7]:
```r
sessionInfo()
```

```
R version 3.5.2 (2018-12-20)
Platform: x86_64-apple-darwin15.6.0 (64-bit)
Running under: macOS Mojave 10.14.3

Matrix products: default
BLAS: /Library/Frameworks/R.framework/Versions/3.5/Resources/lib/libRblas.0.dy
lib
LAPACK: /Library/Frameworks/R.framework/Versions/3.5/Resources/lib/libRlapack.
dylib

locale:
[1] C/UTF-8/C/C/C/C

attached base packages:
[1] stats     graphics  grDevices utils     datasets  methods   base

loaded via a namespace (and not attached):
 [1] compiler_3.5.2  IRdisplay_0.7.0 pbdZMQ_0.3-3    tools_3.5.2
 [5] htmltools_0.3.6 base64enc_0.1-3 crayon_1.3.4    Rcpp_1.0.0
 [9] uuid_0.1-2      IRkernel_0.8.15 jsonlite_1.6    digest_0.6.18
[13] repr_0.19.2     evaluate_0.12
```

Function to get locale

```
In [8]: Sys.getlocale()
```

'C/UTF-8/C/C/C/C'

Function to get current working directory

In [9]: `getwd()`

'/Users/kuoyaojen/r_programming'

Function to set working directory

- Always use forward slash when declaring path
- Back slash has other functionalities, such as escape, Unicode...
- Try not to use non-English username

```
In [10]:  #setwd("/Users/USERNAME/Desktop") # MacOS desktop
          #setwd("C:/Users/USERNAME/Desktop") # Windows desktop
```

Function to quit RStudio

Not saving workspace image is recommended.

In [11]:
```r
# q()
```

Common learning path for R programming

- Installation of compiler or interpreter
- Choosing a friendly IDE
- Quickstart
- Data structure: vector types
- Control flows: conditionals
- Control flows: iterations
- Functions
- (Optional) Class
- (Optional) Package development