

## QF-104: Data Management in R

### Instructors:

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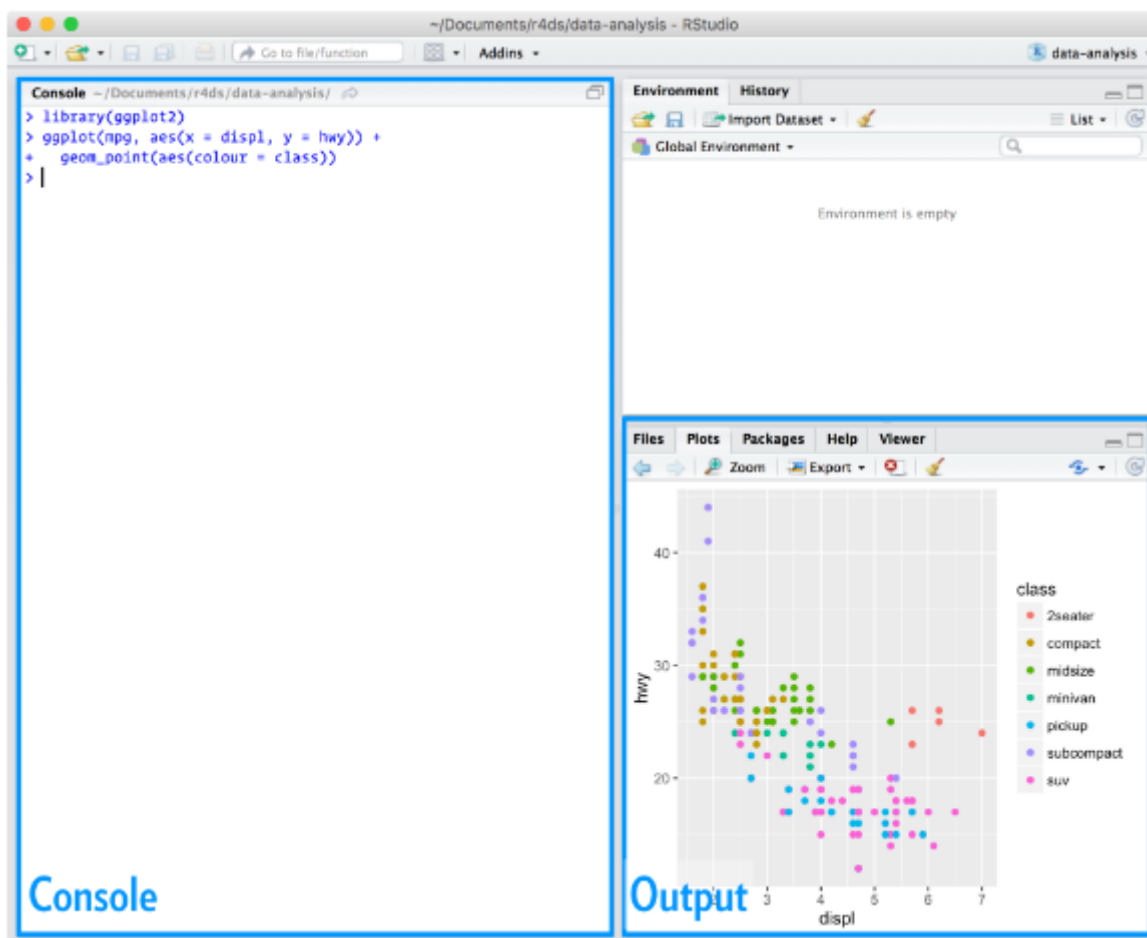
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### What is R?

- R is an overgrown calculator.
- R is a free software for statistical computing and visualization.
- R is a programming language.

### What is RStudio?

- RStudio is a free IDE (integrated development environment) specifically for R.



## Write Code

Navigate tabs  
Open in new window  
Save  
Find and replace  
Compile as notebook  
Run selected code

Annotations for 'Write Code':

- Source with or without Echo**: Points to the 'Run' button in the toolbar.
- Show file outline**: Points to the 'Source' button in the toolbar.
- Multiple cursors/column selection with Alt + mouse drag**: Points to the code editor.
- Code diagnostics that appear in the margin. Hover over diagnostic symbols for details.**: Points to the left margin of the code editor.
- Syntax highlighting based on your file's extension**: Points to the code editor.
- Tab completion to finish function names, file paths, arguments, and more.**: Points to the code editor.
- Multi-language code snippets to quickly use common blocks of code.**: Points to the 'for' loop snippet in the code editor.
- Jump to function in file**: Points to the 'foo' function definition in the code editor.
- Change file type**: Points to the file type dropdown in the bottom right corner.

```

1 # Good Start...
2 # shared users
3
4
5
6 "P0030001"
7 "P0030002"
8 "P0030003"
9 "P0030004"
10
11
12 get_digit <-function() {
13   ("num" %>% (10 ^ n))
14   %/% (10 ^ (n - 1))
15 }
16
17 fo
18   for {snippet}
19   foo {GlobalEnv}
20   force {base}
21
22
23 (Top Level)
  
```

Console output:

```

> foo(1)
[1] 2
> foo <- function(x) x + 1
> foo(2)
[1] 3
> foo(2)
[1] 3
> foo(1)
[1] 2
  
```

## R Support

Import data with wizard  
History of past commands to run/copy  
Display .RPres slideshows  
**File > New File > R Presentation**

Annotations for 'R Support':

- Load workspace**: Points to the 'Load workspace' button in the Environment pane.
- Save workspace**: Points to the 'Save workspace' button in the Environment pane.
- Delete all saved objects**: Points to the 'Delete all saved objects' button in the Environment pane.
- Search inside environment**: Points to the search bar in the Environment pane.
- Choose environment to display from list of parent environments**: Points to the 'Global Environment' dropdown in the Environment pane.
- Display objects as list or grid**: Points to the 'List' button in the Environment pane.
- Displays saved objects by type with short description**: Points to the 'Data' section in the Environment pane.
- View in data viewer**: Points to the 'View in data viewer' button in the Environment pane.
- View function source code**: Points to the 'View function source code' button in the Environment pane.
- Create folder**: Points to the 'New Folder' button in the Files pane.
- Upload file**: Points to the 'Upload' button in the Files pane.
- Delete file**: Points to the 'Delete' button in the Files pane.
- Rename file**: Points to the 'Rename' button in the Files pane.
- Change directory**: Points to the 'More' button in the Files pane.
- Path to displayed directory**: Points to the 'Path to displayed directory' text in the Files pane.
- Working Directory**: Points to the 'Working Directory' text in the Files pane.
- Maximize, minimize panes**: Points to the maximize/minimize buttons in the Files pane.
- Drag pane boundaries**: Points to the drag handle in the Files pane.
- Press ↑ to see command history**: Points to the 'Up' arrow button in the Files pane.

Environment pane:

Global Environment	Load workspace	Save workspace	Delete all saved objects	Search inside environment
iris	150 obs. of 5 variables			
Values				
a	1			
Functions	function (x)			

Files pane:

```

New Folder Upload Delete Rename More
Name
..
hello.R
19 B Apr 13, 2016, 11:17 AM
  
```

# RStudio IDE :: CHEAT SHEET

## Documents and Apps

Annotations for Documents and Apps:

- Check spelling
- Render output
- Choose output format
- Choose output location
- Insert code chunk
- Jump to previous chunk
- Jump to next chunk
- Run selected lines
- Publish to server
- Show file outline
- Access markdown guide at **Help > Markdown Quick Reference**
- Jump to chunk
- Set knitr all previous options
- Run this code chunk
- Run this code chunk
- RStudio recognizes that files named **app.R**, **server.R**, **ui.R**, and **global.R** belong to a shiny app
- Run app
- Choose location to view app
- Publish to shinyapps.io or server
- Manage publish accounts

## Write Code

Annotations for Write Code:

- Navigate tabs
- Open in new window
- Save
- Find and replace
- Compile as notebook
- Run selected code
- Import data with wizard
- History of past commands to run/copy
- Display .Rpres slideshows
- File > New File > R Presentation**
- Load workspace
- Save workspace
- Delete all saved objects
- Search inside environment
- Choose environment to display from list of parent environments
- Display objects as list or grid
- Multi-cursors/column selection with **Alt + mouse drag**
- Re-run previous code without Echo
- Source with or without Echo
- Show file outline
- Code diagnostics that appear in the margin
- Hover over diagnostic symbols for details
- Syntax highlighting based on your file's extension
- Tab completion to finish function names, file paths, arguments, and more
- Multi-language code snippets to quickly use common blocks of code
- Jump to function in file
- Change file type
- Working Directory
- Maximize, minimize panes
- Press **Alt** to see command history
- Drag pane boundaries
- Path to displayed directory
- A file browser keyed to your working directory. Click on file or directory name to open.

## R Support

## Pro Features

Annotations for Pro Features:

- Share Project with Collaborators
- Active shared collaborators
- Start new R Session in current project
- Close R Session in project
- Select R Version
- PROJECT SYSTEM**
- File > New Project**
- RStudio saves the call history, workspace, and working directory associated with a project. It reloads each when you re-open a project.
- Name of current project
- RStudio opens plots in a dedicated Plots pane
- Navigate recent plots
- Open in new window
- Export plot
- Delete plot
- Delete all plots
- GUI Package manager lists every installed package
- Install Packages
- Update Packages
- Create reproducible package library for your project
- Click to load package with **library()**. Unclick to detach package with **detach()**
- Package version installed
- Delete from library
- RStudio opens documentation in a dedicated Help pane
- Home page of helpful links
- Search within help file
- Search for help file
- Viewer Pane displays HTML content, such as Shiny apps, RMarkdown reports, and interactive visualizations
- Stop Shiny app
- Publish to shinyapps.io, rpubs, RSCloud, ...
- Refresh
- View<data>** opens spreadsheet like view of data set
- Filter rows by value or value range
- Sort by values
- Search for value

## Debug Mode

Annotations for Debug Mode:

- Open with **debug()**, **browse()**, or a breakpoint. RStudio will open the debugger mode when it encounters a breakpoint while executing code.
- Click next to line number to add/remove a breakpoint
- Highlighted line shows where execution has paused
- Run commands in environment where execution has paused
- Examine variables in executing environment
- Select function in traceback to debug
- Step through code one line at a time
- Step into and out of functions to run
- Resume execution
- Quit debug mode
- Launch debugger mode from origin of error
- Open traceback to examine the functions that R called before the error occurred
- Show Traceback
- Return with Debug
- Next
- Continue
- Stop

## Version Control with Git or SVN

Annotations for Version Control:

- Turn on at **Tools > Project Options > Git/SVN**
- Show file diff
- Commit staged files
- Push/Pull to remote
- View History
- Added
- Deleted
- Modified
- Renamed
- Untracked
- Open shell to type commands
- current branch

## Package Writing

Annotations for Package Writing:

- File > New Project > New Directory > R Package**
- Turn project into package. Enable roxygen documentation with **Tools > Project Options > Build Tools**
- Roxygen guide at **Help > Roxygen Quick Reference**



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