DEMYSTIFYING CREATING CUSTOM LIBRARIES FOR YOUR ORGANIZATION

By: Dan Caley

MY HOPES FOR THIS PRESENTATION

That you will all be inspired to create your own custom R Libraries

Introductions

- My Name is Dan Caley
- My hobbies are hiking and taking care of my dog Helmet
- I Work at Custom Ink
- I’m a Senior Data Analyst

https://github.com/rstudio/rstudio-conf-2022-program/

Custom Ink

- At Custom Ink we are big believers in the power and importance of community.
- Custom Ink enables people to design and order custom t-shirts and gear for their clubs, companies, charities, family reunions, and more.
- This is consistent with building Libraries

Building Custom Libraries

Libraries allow a community of people to take their functions in their organization and group them into a single package.

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WHY PACKAGE YOUR FUNCTIONS INTO A LIBRARY

Why Package Your Functions into a Library

If you every have had the internal thought process…

- Where did I save that function again?
- Why can’t I find that function?
- Was that function in my notepad, R-markdown, or did I physically print it, and fax it to myself?
- Let me just re-write this function I constantly use.
- Oh wow my co-workers could really benefit from using this function.

Value of Packaging Your Functions into a Library

- If you are finding yourself constantly re-using the same function then you should elevate these functions into a packages.
- Sharing these function may help teammates with their work.
- Encourages others in your organization to add their functions to your library

WHAT IS A FUNCTION

What is a Function?

- A **Function** is a set of statements that when combined performs a specific task.

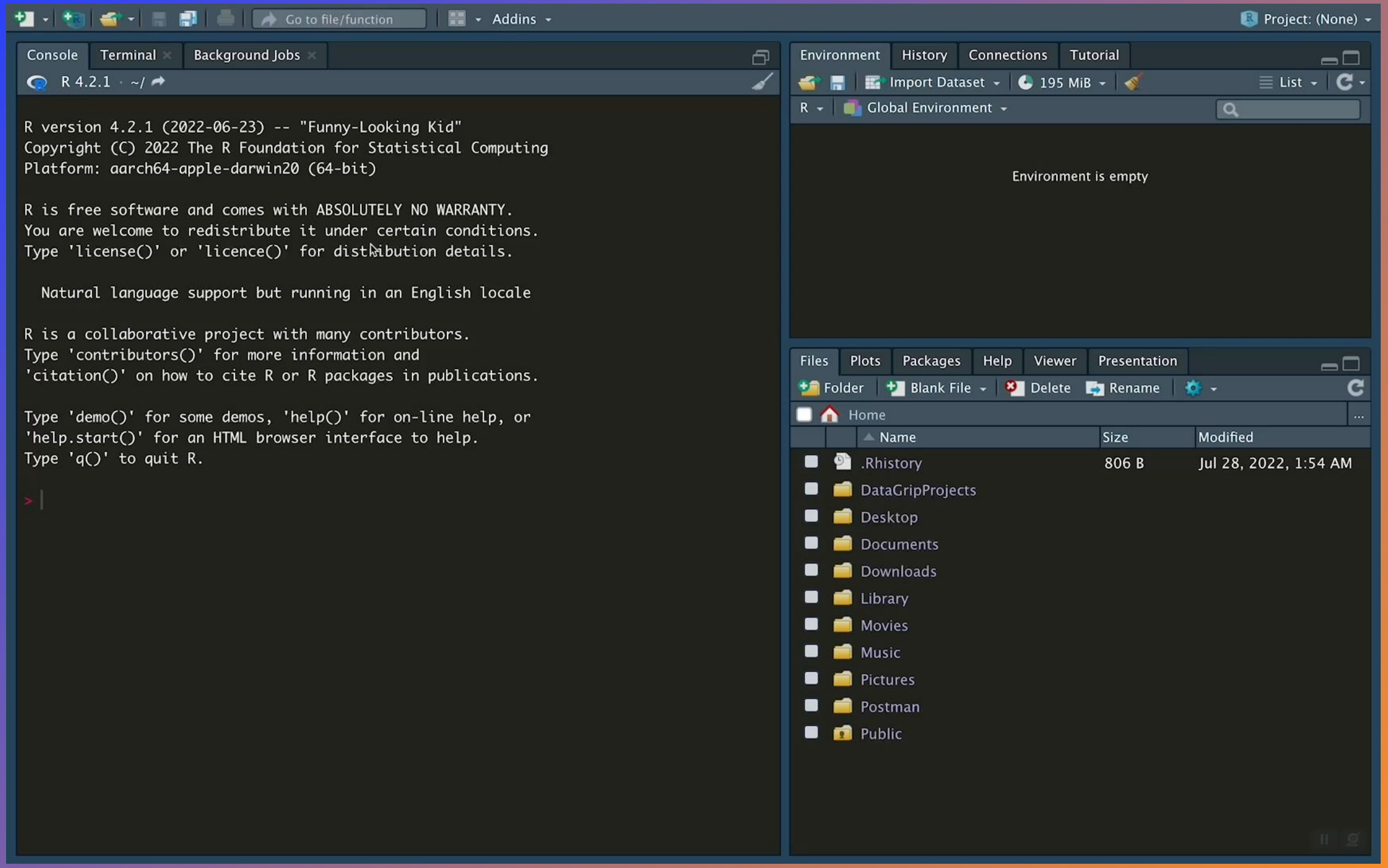
- Function Example:

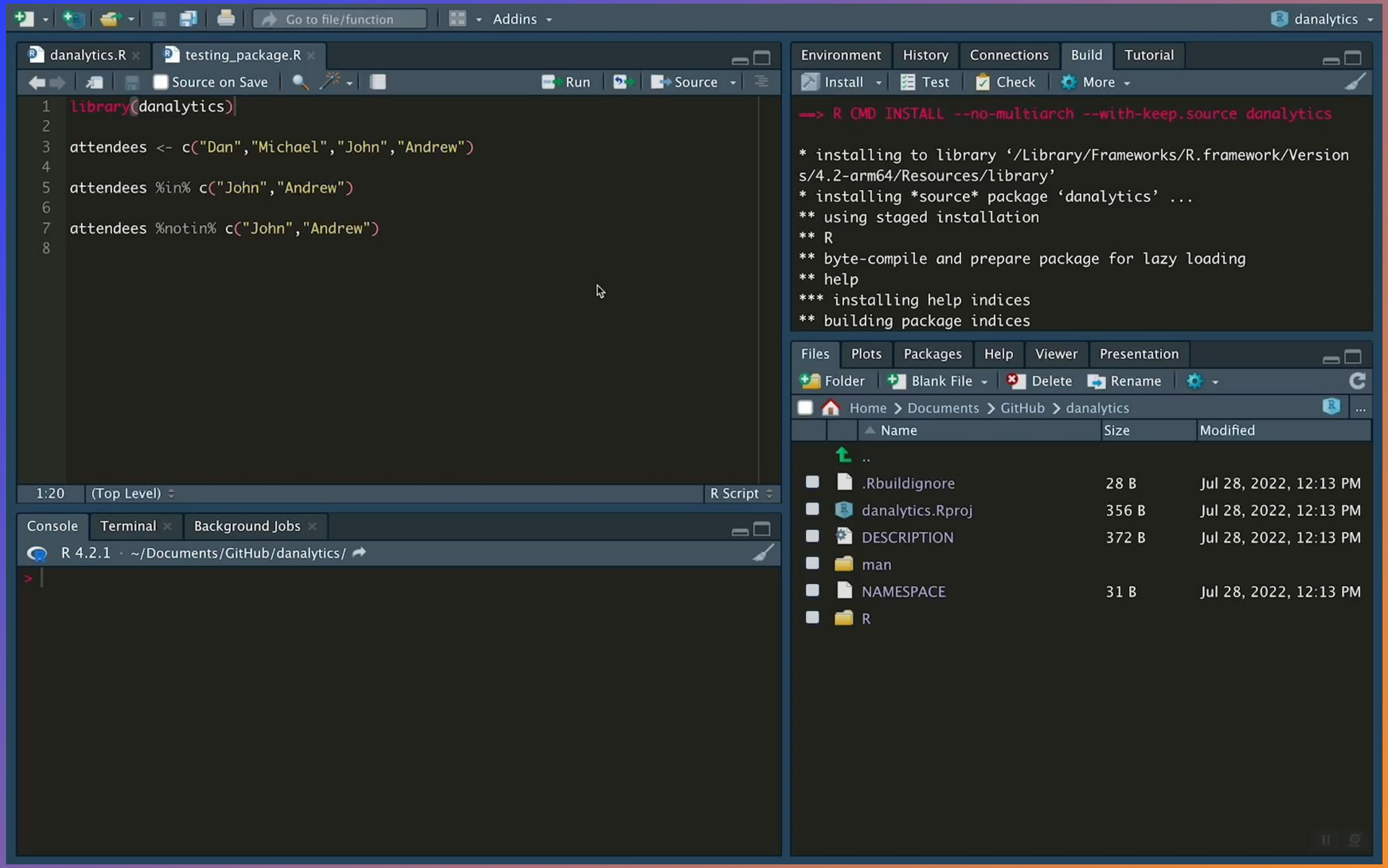
  - Let's build a **`*notiǹ*** function.

  - Similar to the **`*iǹ*** function which filters on a list of values, *not in* will exclude the values.

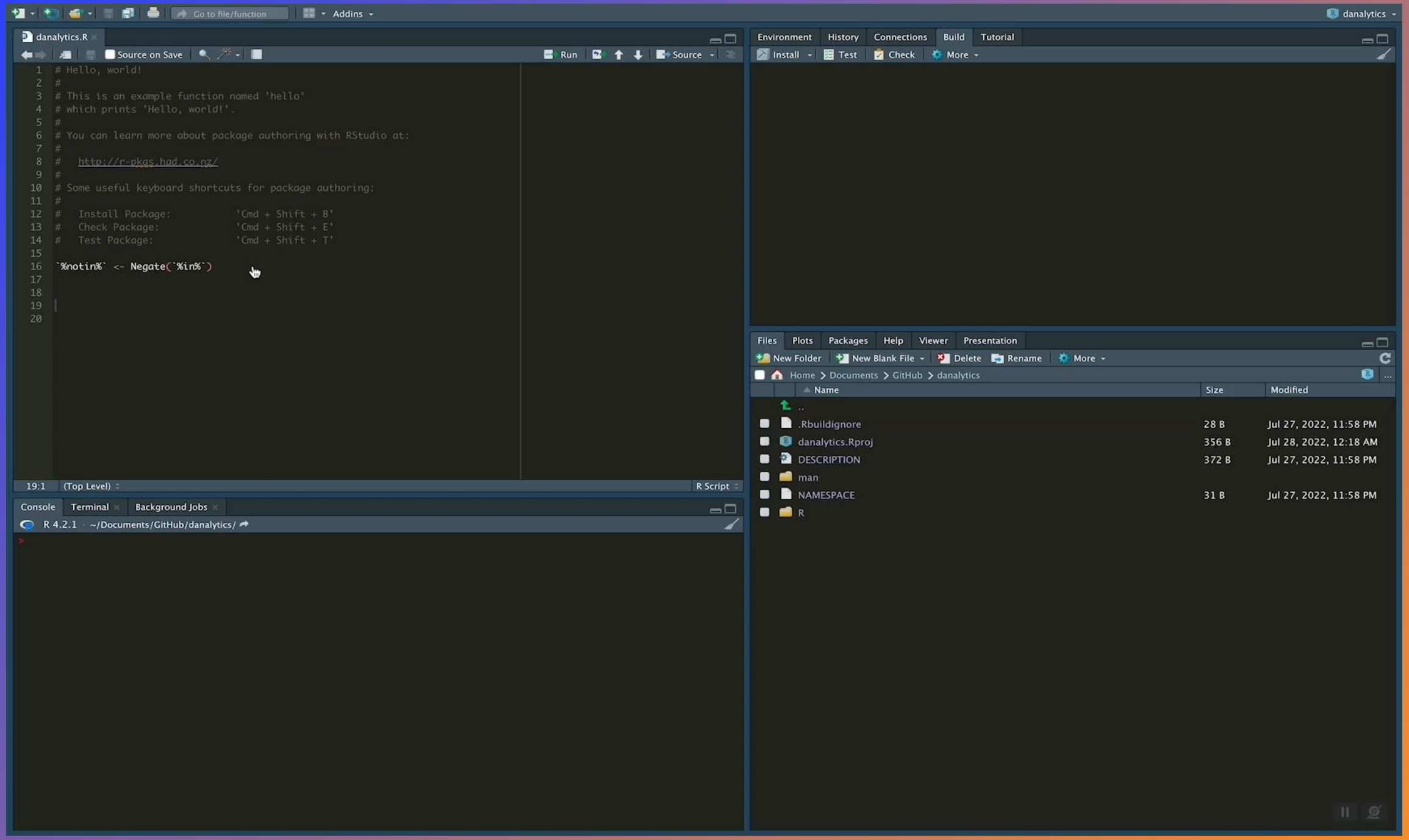
  - `%notin%` <- Negate(`%in%`)

CREATING A LIBRARY


Go to file/function
Addins
Project: (None)
Console
Terminal
Background Jobs
R 4.2.1 · ~/
R version 4.2.1 (2022-06-23) -- "Funny-Looking Kid"
Copyright (C) 2022 The R Foundation for Statistical Computing
Platform: aarch64-apple-darwin20 (64-bit)
R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.
Natural language support but running in an English locale
R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.
Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.
>
Environment
History
Connections
Tutorial
Import Dataset
195 MiB
List
R
Global Environment
Environment is empty
Files
Plots
Packages
Help
Viewer
Presentation
Folder
Blank File
Delete
Rename
Home
Name
Size
Modified
.Rhistory
806 B
Jul 28, 2022, 1:54 AM
DataGripProjects
Desktop
Documents
Downloads
Library
Movies
Music
Pictures
Postman
Public


Go to file/function
Addins
danalytics
danalytics.R
testing_package.R
Source on Save
Run
Source
1 library(danalytics)
2
3 attendees <- c("Dan","Michael","John","Andrew")
4
5 attendees %in% c("John","Andrew")
6
7 attendees %notin% c("John","Andrew")
8
1:20
(Top Level)
R Script
Console
Terminal
Background Jobs
R 4.2.1 · ~/Documents/GitHub/danalytics/
>
Environment
History
Connections
Build
Tutorial
Install
Test
Check
More
==> R CMD INSTALL --no-multiarch --with-keep.source danalytics
* installing to library '/Library/Frameworks/R.framework/Versions/4.2-arm64/Resources/library'
* installing *source* package 'danalytics' ...
** using staged installation
** R
** byte-compile and prepare package for lazy loading
** help
*** installing help indices
** building package indices
Files
Plots
Packages
Help
Viewer
Presentation
Folder
Blank File
Delete
Rename
Home > Documents > GitHub > danalytics
Name
Size
Modified
..
.Rbuildignore 28 B Jul 28, 2022, 12:13 PM
danalytics.Rproj 356 B Jul 28, 2022, 12:13 PM
DESCRIPTION 372 B Jul 28, 2022, 12:13 PM
man
NAMESPACE 31 B Jul 28, 2022, 12:13 PM
R

DOCUMENTING YOUR FUNCTION


Go to file/function
Addins
danalytics
danalytics.R
Source on Save
Run
Source
Hello, world!
#
This is an example function named 'hello'
which prints 'Hello, world!'.
#
You can learn more about package authoring with RStudio at:
#
http://r-pkgs.had.co.nz/
#
Some useful keyboard shortcuts for package authoring:
#
Install Package: 'Cmd + Shift + B'
Check Package: 'Cmd + Shift + E'
Test Package: 'Cmd + Shift + T'
`%notin%` <- Negate(`%in%`)
19:1
(Top Level)
R Script
Console
Terminal
Background Jobs
R 4.2.1 · ~/Documents/GitHub/danalytics/
Environment
History
Connections
Build
Tutorial
Install
Test
Check
More
Files
Plots
Packages
Help
Viewer
Presentation
New Folder
New Blank File
Delete
Rename
More
Home › Documents › GitHub › danalytics
Name
Size
Modified
..
.Rbuildignore
28 B
Jul 27, 2022, 11:58 PM
danalytics.Rproj
356 B
Jul 28, 2022, 12:18 AM
DESCRIPTION
372 B
Jul 27, 2022, 11:58 PM
man
NAMESPACE
31 B
Jul 27, 2022, 11:58 PM
R

How to Install Your Library

Github Public

Github Enterprise

A Shared File Directory

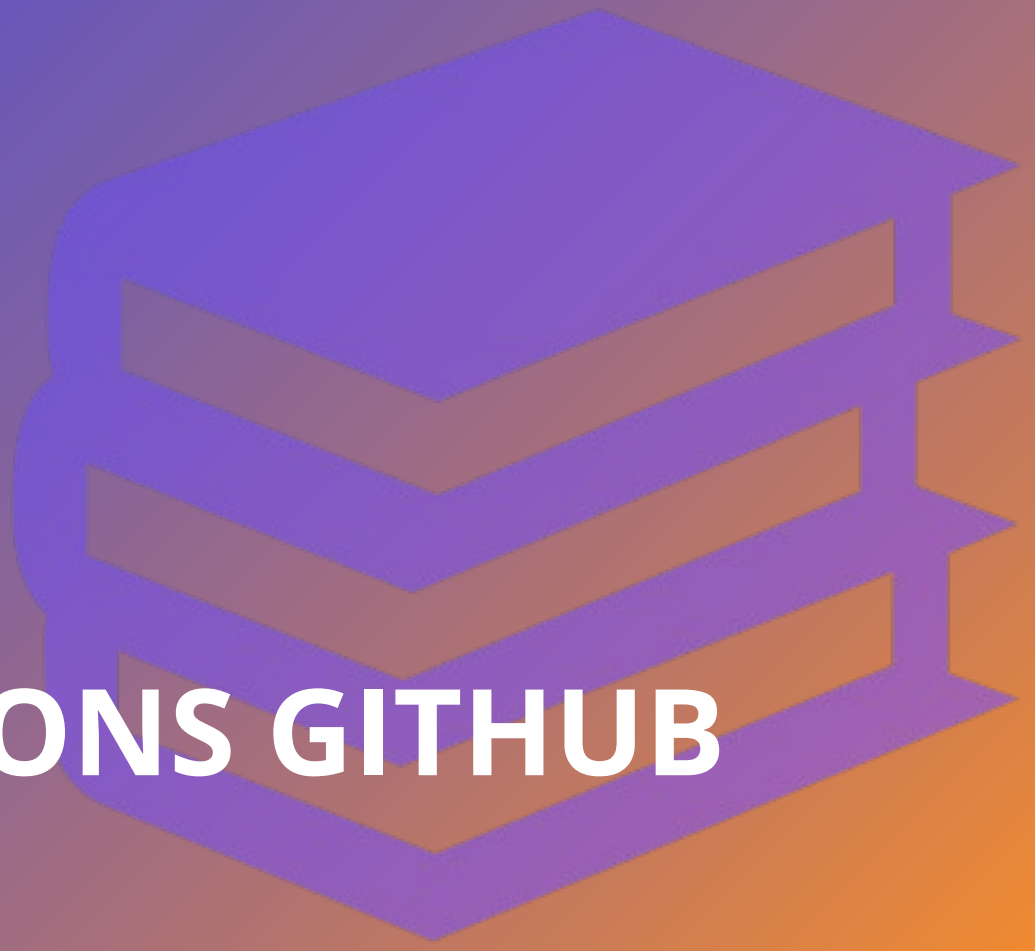
INSTALLING FROM GITHUB PUBLIC

Installing from Github Public

Install.packages(“devtools”)
Library(devtools)
Install_github(“DeveloperName/PackageName”)

Example:
Install_github(“dcaley5005/danalytics”)

INSTALLING FROM YOUR ORGANIZATIONS GITHUB



Installing from Github Enterprise

Install.packages(“usethis”)

Library(usethis)

Use_git_config(user.name = “daffy.duck”, user.email = “daffy.duck@funnyducks.com”)

Create_github_token()

Reference: cran.r-project.org/web/packages/githubinstall/vignettes/githubinstall.html

GitHub Apps
OAuth Apps
Personal access tokens

New personal access token

Personal access tokens function like ordinary OAuth access tokens. They can be used instead of a password for Git over HTTPS, or can be used to authenticate to the API over Basic Authentication.

Note

DESCRIBE THE TOKEN'S USE CASE

What's this token for?

Describe the token use case

Expiration *

30 days — The token will expire on Sun, Aug 21 2022

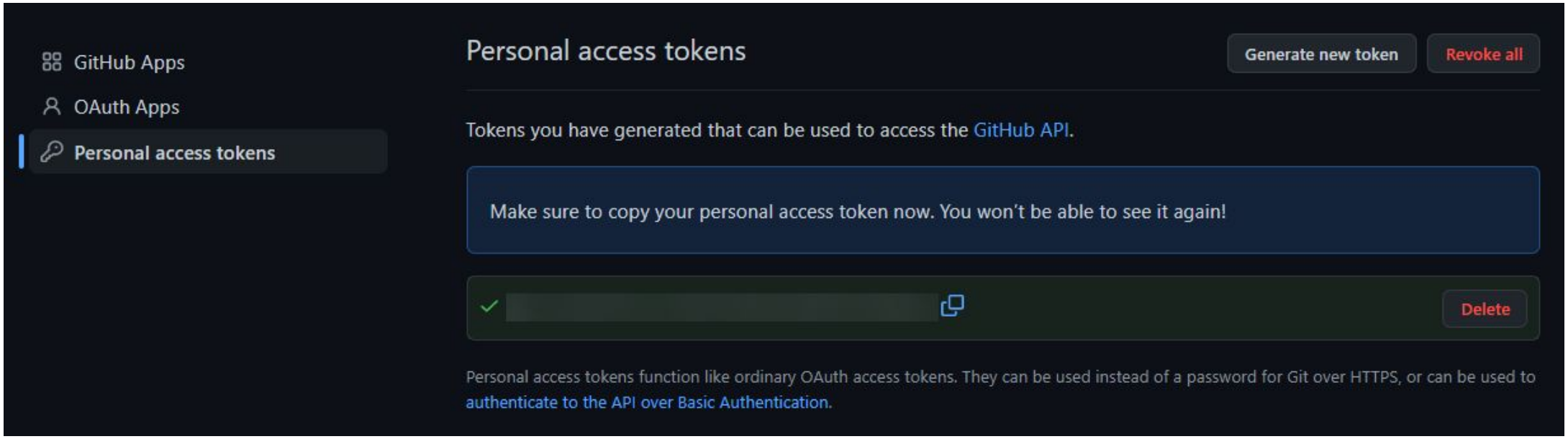
Set an expiration. You can set this to never expire.

Select scopes

Scopes define the access for personal tokens. Read more about OAuth scopes.

repo	Full control of private repositories
repo:status	Access commit status
repo_deployment	Access deployment status
public_repo	Access public repositories
repo:invite	Access repository invitations
security_events	Read and write security events
workflow	Update GitHub Action workflows
write:packages	Upload packages to GitHub Package Registry
read:packages	Download packages from GitHub Package Registry
delete:packages	Delete packages from GitHub Package Registry
admin:org	Full control of orgs and teams, read and write org projects
write:org	Read and write org and team membership, read and write org projects
read:org	Read org and team membership, read org projects
admin:public_key	Full control of user public keys
write:public_key	Write user public keys

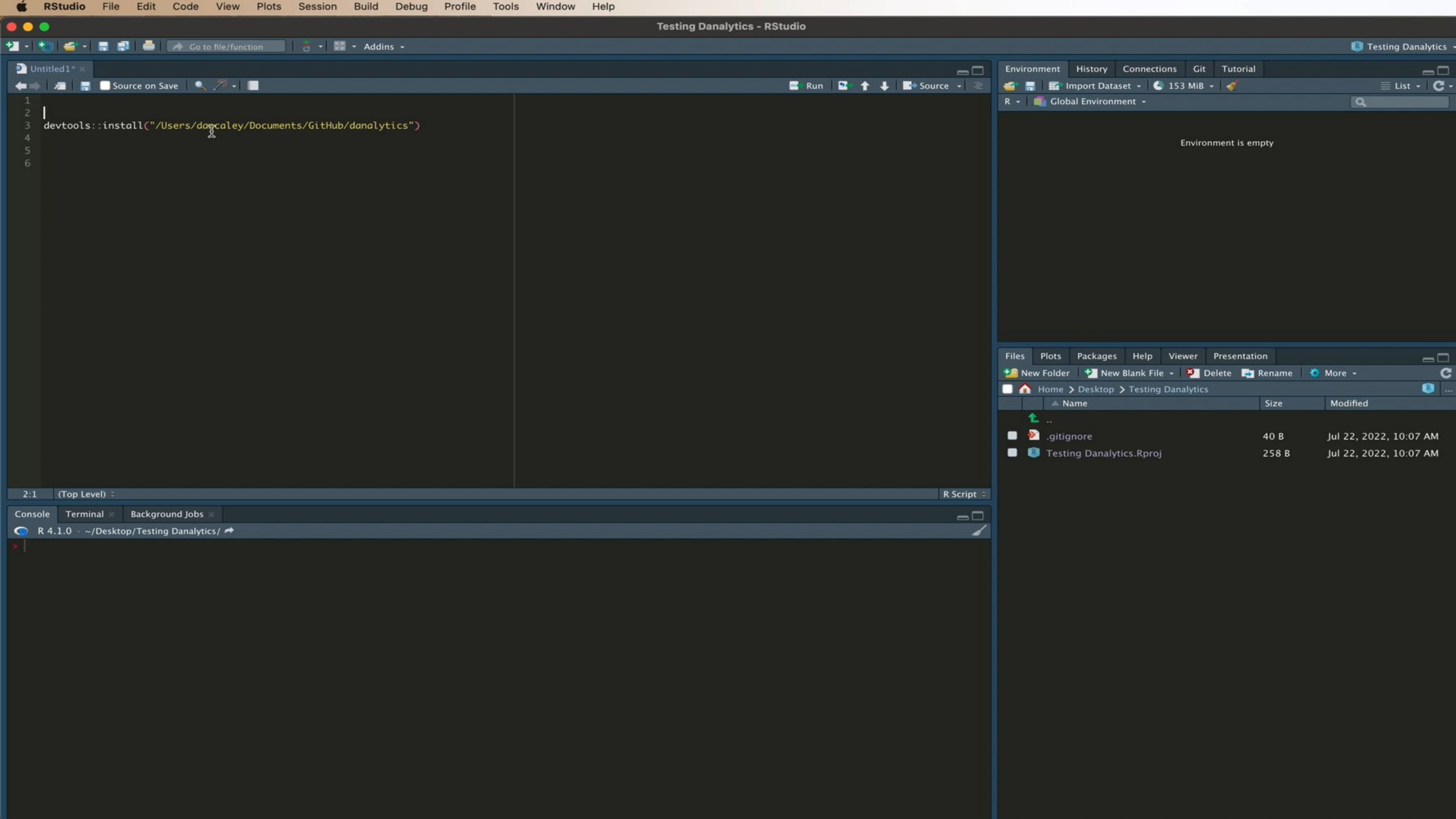
Installing from Github Enerprise (cont.)



Installing from Github Enterprise (cont.)

```
Install.packages(“devtools”)
Library(devtools)
install_github(
        “companyname/danalytics”,
      ref = “main”,
      auth_token = “INSERT_TOKEN_HERE”
       )
```

INSTALLING FROM A FILE DIRECTORY


RStudio File Edit Code View Plots Session Build Debug Profile Tools Window Help
Testing Danalytics - RStudio
Go to file/function
Addins
Testing Danalytics
Untitled1*
Source on Save
Run
Source
1
2
3
devtools::install("/Users/dancaley/Documents/GitHub/danalytics")
4
5
6
2:1
(Top Level)
R Script
Console
Terminal
Background Jobs
R 4.1.0 · ~/Desktop/Testing Danalytics/
Environment
History
Connections
Git
Tutorial
Import Dataset
153 MiB
List
R
Global Environment
Environment is empty
Files
Plots
Packages
Help
Viewer
Presentation
New Folder
New Blank File
Delete
Rename
More
Home > Desktop > Testing Danalytics
Name
Size
Modified
..
.gitignore
40 B
Jul 22, 2022, 10:07 AM
Testing Danalytics.Rproj
258 B
Jul 22, 2022, 10:07 AM

SOME EXAMPLES

Connecting to a SQL Database

```
inkbase <- function(){

  db_host <- 
  db_username <- keyring::key_list(db_host)[1,2]

  connection <- RPostgreSQL::dbConnect(RPostgreSQL::PostgreSQL(),
                        dbname = ,
                        user = db_username,
                        password = keyring::key_get(db_host, db_username),
                        host = db_host,
                        port= ')
  connection

}
```

https://support.rstudio.com/hc/en-us/articles/214510788-Setting-up-R-to-connect-to-SQL-Server-

Documentation

Note

before using the inkbase function please follow the directions below to set up your credential.

1. install and load the keyring library

```
install.packages("keyring")
library(keyring)
```

2. Set up databases and passwords. Normal keyring set up is the first line below in addition to entering your password when prompted.

```
key_set(service, username)
key_set("[redacted]","daffy.duck")
```

output:

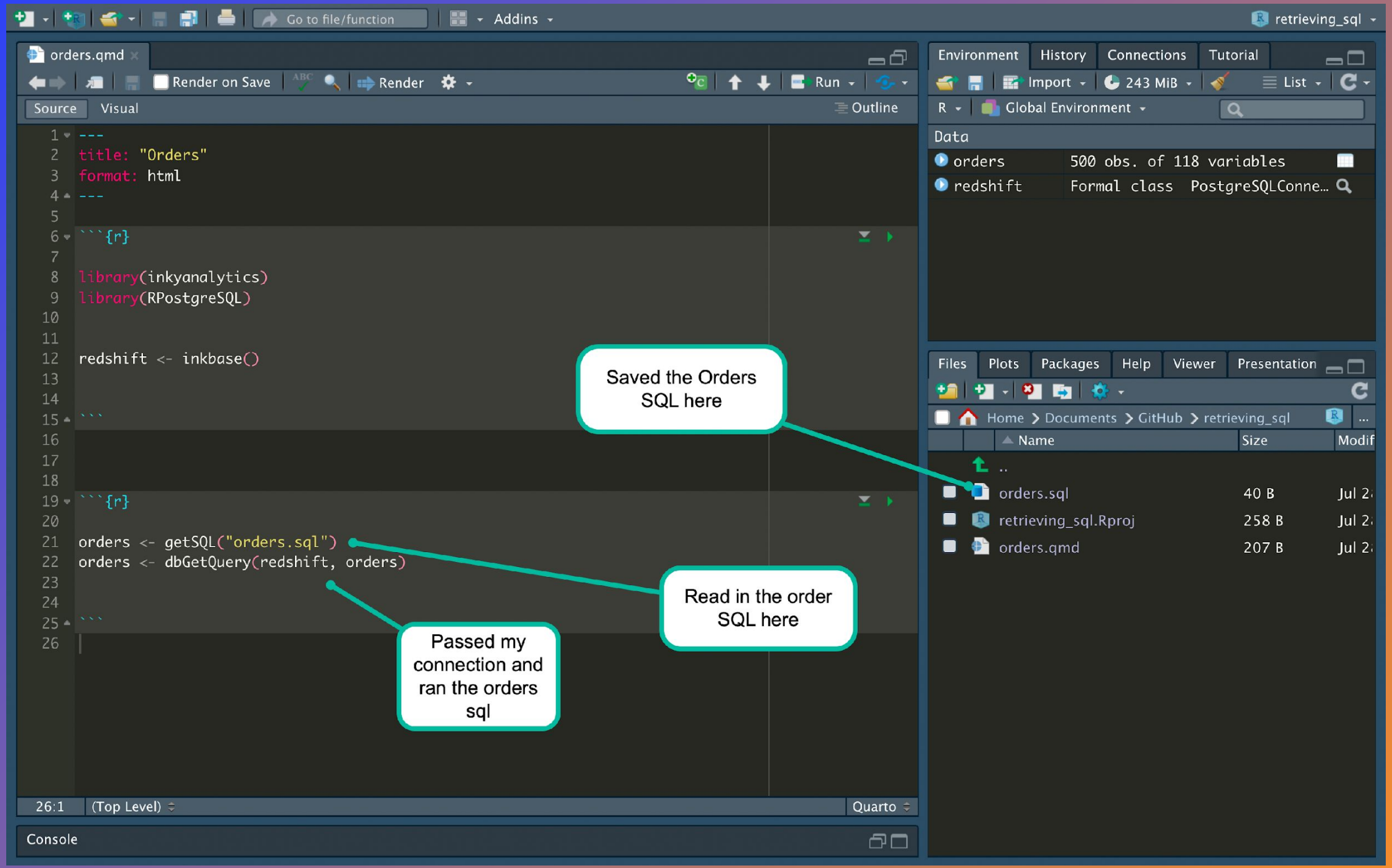
```
service                                    username
[redacted]                                 daffy.duck
```

Reading a SQL file

```
getSQL <- function(filepath){
  con = file(filepath, "r")
  sql.string <- ""

  while (TRUE){
    line <- readLines(con, n = 1)

    if ( length(line) == 0 ){
      break
    }

    line <- gsub("\\t", " ", line)

    if(grepl("--",line) == TRUE){
      line <- paste(sub("--","/*",line),"*/")
    }

    sql.string <- paste(sql.string, line)
  }

  close(con)
  return(sql.string)
}
```

- I like to write SQL in a different IDE
- Save the SQL down
- Read the SQL file
- Then run the SQL code using Rpostgress

https://stackoverflow.com/questions/44853322/how-to-read-the-contents-of-an-sql-file-into-an-r-script-to-run-a-query


Go to file/function
Addins
retrieving_sql
orders.qmd
Render on Save
Render
Run
Source
Visual
Outline
---
title: "Orders"
format: html

```{r}
library(inkyanalytics)
library(RPostgreSQL)
redshift <- inkbase()
```
```{r}
orders <- getSQL("orders.sql")
orders <- dbGetQuery(redshift, orders)
```
26:1
(Top Level)
Quarto
Console
Environment
History
Connections
Tutorial
Import
243 MiB
List
R
Global Environment
Data
orders
500 obs. of 118 variables
redshift
Formal class PostgreSQLConne...
Files
Plots
Packages
Help
Viewer
Presentation
Home > Documents > GitHub > retrieving_sql
Name
Size
Modif
..
orders.sql
40 B
Jul 2
retrieving_sql.Rproj
258 B
Jul 2
orders.qmd
207 B
Jul 2
Saved the Orders SQL here
Read in the order SQL here
Passed my connection and ran the orders sql

Adding Copy & CSV to DT

```
dt_inky <- function(x, y){

  button_option <- c('copy', 'csv')
  DT::datatable(x, rownames = F,
                extensions = 'Buttons',
                options = list(pageLength = y,
                               dom = 'Blfrtip',
                               buttons = button_option,
                               lengthMenu = list(c(10,25,50,-1),
                                                 c(10,25,50,"All"))))
}
```

Copy CSV Show 2

Copy and CSV are always in a DataTable Now

Search:

mpg	cyl	disp	hp	drat	wt	qsec	vs	am	gear	carb
21	6	160	110	3.9	2.62	16.46	0	1	4	4
21	6	160	110	3.9	2.875	17.02	0	1	4	4
22.8	4	108	93	3.85	2.32	18.61	1	1	4	1
21.4	6	258	110	3.08	3.215	19.44	1	0	3	1
18.7	8	360	175	3.15	3.44	17.02	0	0	3	2
18.1	6	225	105	2.76	3.46	20.22	1	0	3	1
14.3	8	360	245	3.21	3.57	15.84	0	0	3	4
24.4	4	146.7	62	3.69	3.19	20	1	0	4	2
22.8	4	140.8	95	3.92	3.15	22.9	1	0	4	2
19.2	6	167.6	123	3.92	3.44	18.3	1	0	4	4
17.8	6	167.6	123	3.92	3.44	18.9	1	0	4	4
16.4	8	275.8	180	3.07	4.07	17.4	0	0	3	3
17.3	8	275.8	180	3.07	3.73	17.6	0	0	3	3

QUESTIONS & ANSWERS

https://github.com/rstudio/rstudio-conf-2022-program/