Using  in  VS Code

Kun Ren

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About me

- Hedge fund researcher
- Major collaborator of vscode-R and R language server
- Collaborator of data.table, lintr, etc.
- Author or contributor of numerous R packages on GitHub
- Microsoft MVP on Data Platform
- Author of *Learning R Programming*

File Edit Code View Plots Session Build Debug Profile Tools Help

ken

Go to file/function | Addins | Project: (None)

test2.R | test.Rmd | test.R | plot-test.R | test.Rmd

Source on Save | Run | Source

```
1  # Setup
2  options(scipen=999)  # turn off scientific notation like 1e+06
3  library(ggplot2)
4  data("midwest", package = "ggplot2")  # load the data
5  # midwest <- read.csv("http://goo.gl/G1K41K") # alt source
6
7  library(ggplot2)
8  g <- ggplot(midwest, aes(x=area, y=poptotal)) + geom_point() + geom_smooth(method="lm")  # set se=FALSE to turnoff confidence bands
9
10 # Delete the points outside the limits
11 g + xlim(c(0, 0.1)) + ylim(c(0, 1000000))   # deletes points
12 # g + xlim(0, 0.1) + ylim(0, 1000000)   # deletes points
13
```

13:1 (Top Level) R Script

Console Jobs

R 3.6.3 · ~/

```
> data("midwest", package = "ggplot2")
> # Scatterplot
> gg <- ggplot(midwest, aes(x=area, y=poptotal)) +
+   geom_point(aes(col=state, size=popdensity)) +
+   geom_smooth(method="loess", se=F) +
+   xlim(c(0, 0.1)) +
+   ylim(c(0, 500000)) +
+   labs(subtitle="Area Vs Population",
+        y="Population",
+        x="Area",
+        title="Scatterplot",
+        caption = "Source: midwest")
> # Setup
> options(scipen=999)  # turn off scientific notation like 1e+06
> library(ggplot2)
> data("midwest", package = "ggplot2")  # load the data
> library(ggplot2)
> g <- ggplot(midwest, aes(x=area, y=poptotal)) + geom_point() + geom_smooth(method="lm")  # set se=FALSE to turnoff confidence bands
> # Delete the points outside the limits
> g + xlim(c(0, 0.1)) + ylim(c(0, 1000000))   # deletes points
`geom_smooth()` using formula 'y ~ x'
Warning messages:
1: Removed 5 rows containing non-finite values (stat_smooth).
2: Removed 5 rows containing missing values (geom_point).
>
>
```

Environment | History | Connections | Tutorial

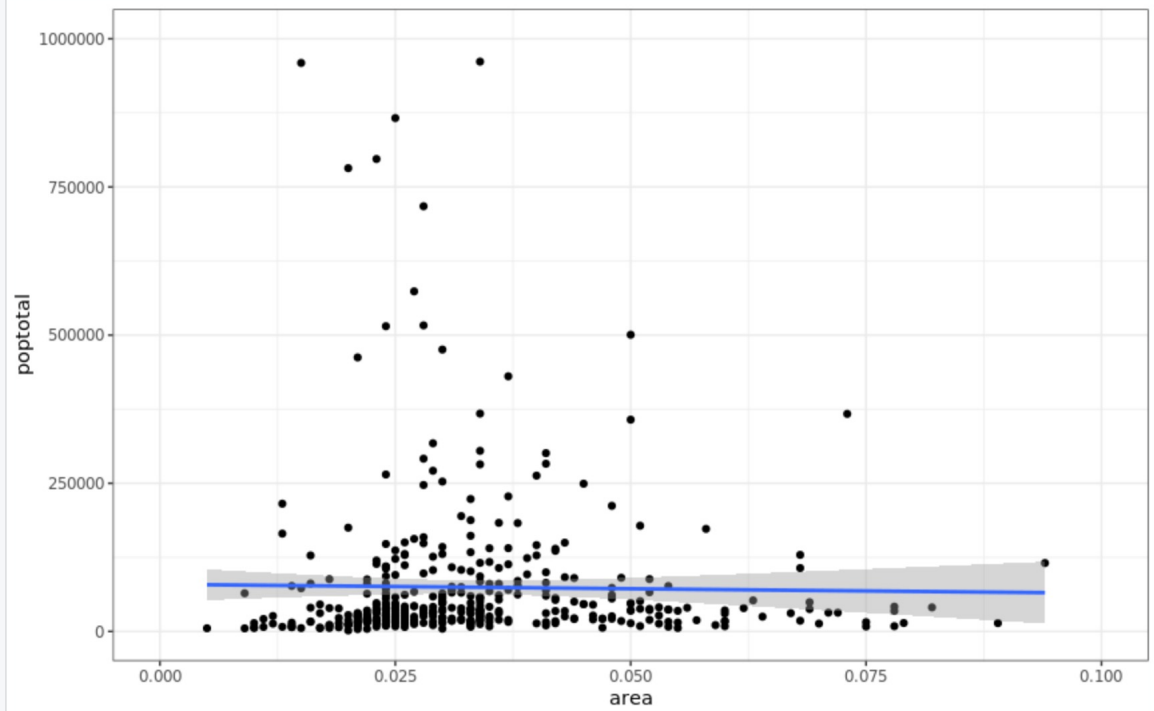
Import Dataset | 302 MiB | List

R | Global Environment

Data	
g	List of 9
midwest	437 obs. of 28 variables

Files | Plots | Packages | Help | Viewer

Zoom | Export | Publish



RStudio Desktop/Server

Editor

- Syntax highlight:
  - R, C++, Python, etc.
- Completion:
  - R, C++
- Code snippets
- R Markdown
- R Notebook
- Add-ins

User interface

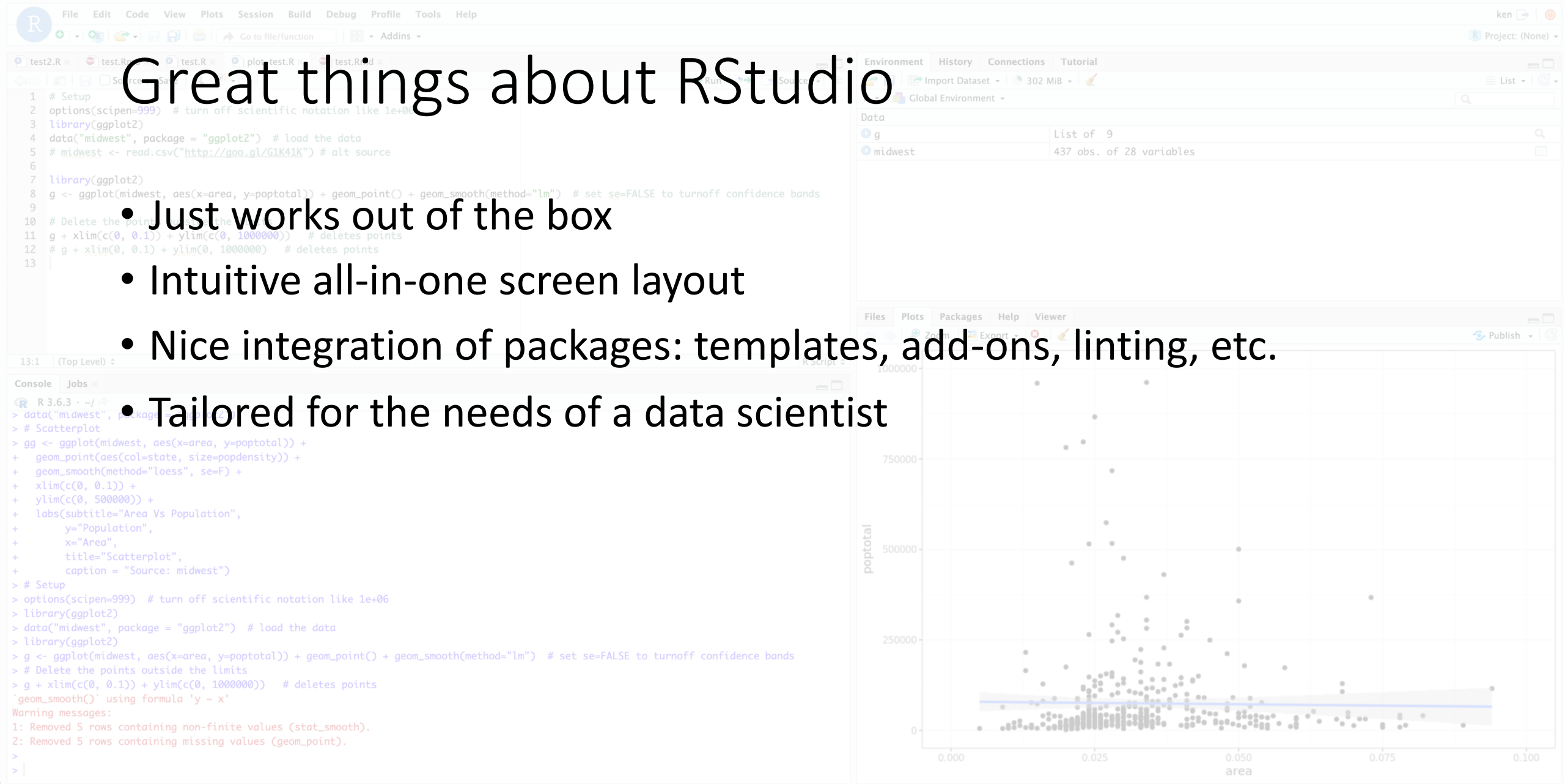
- Files
- Packages
- Help
- Environment
- Plot
- Viewer
- R console
- Terminal

Features

- Debugging
- Background jobs
- Simple Git support
- Code linting

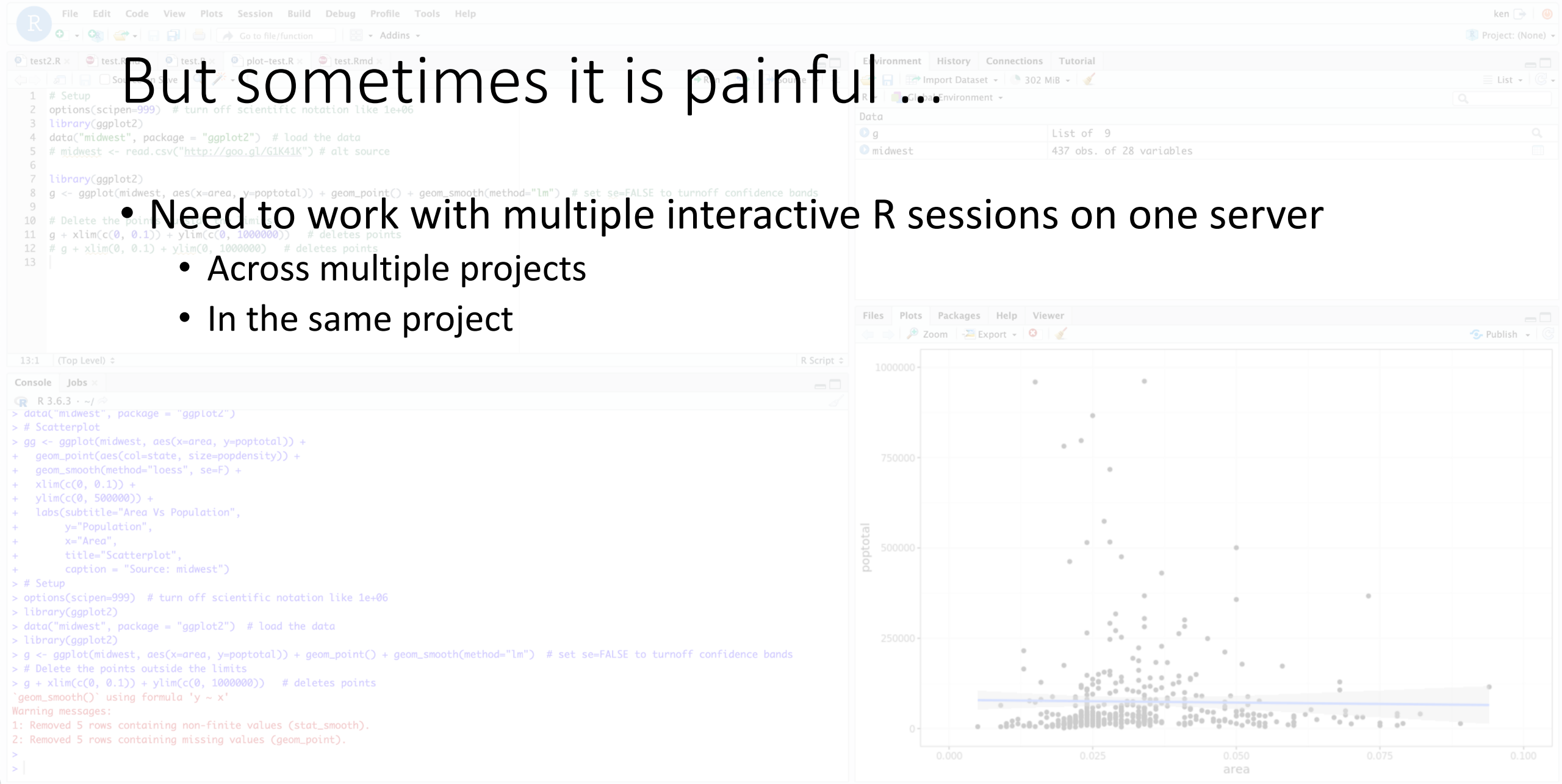
Great things about RStudio

- Just works out of the box
- Intuitive all-in-one screen layout
- Nice integration of packages: templates, add-ons, linting, etc.
- Tailored for the needs of a data scientist



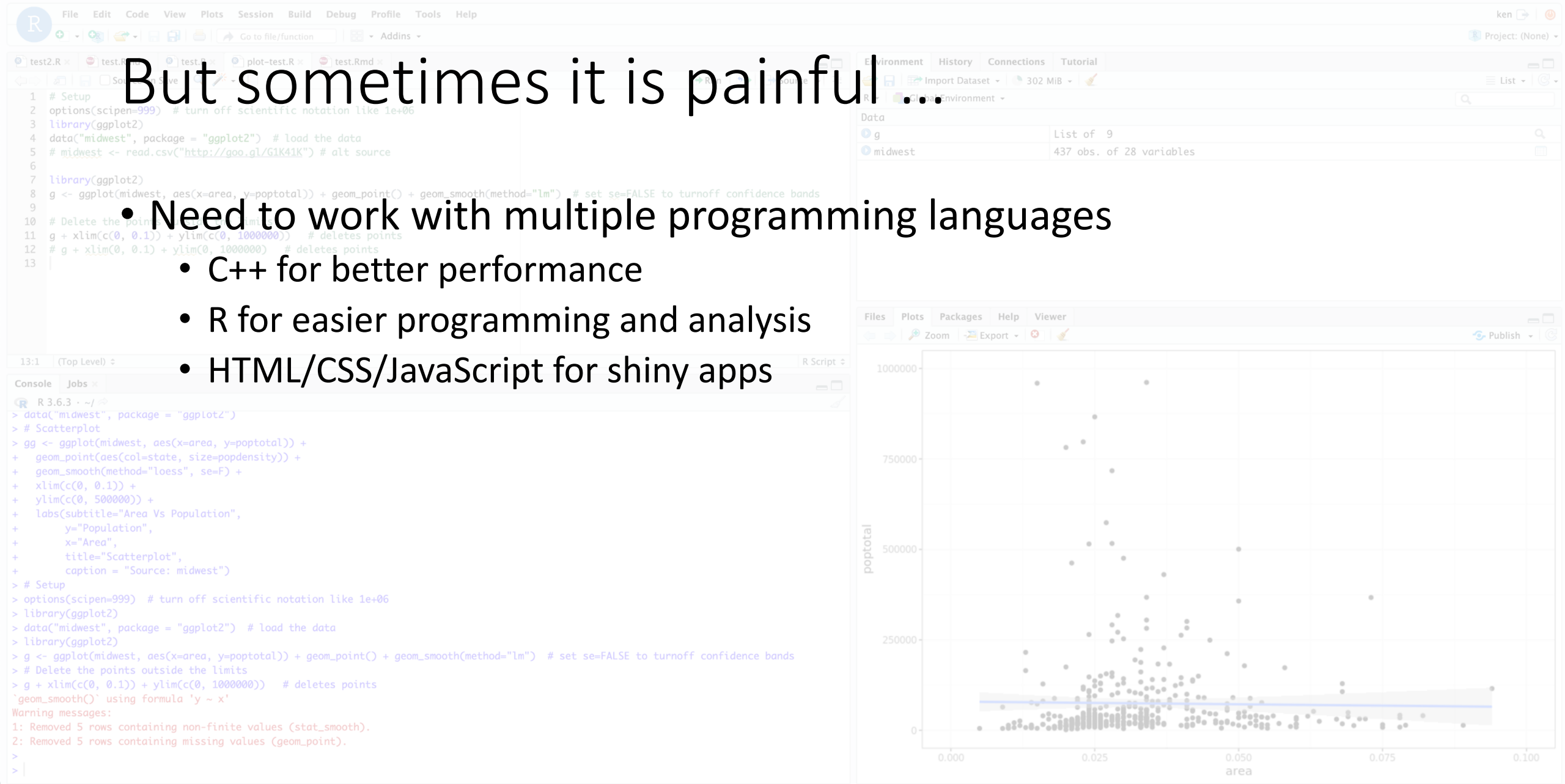
But sometimes it is painful …

- Need to work with multiple interactive R sessions on one server
  - Across multiple projects
  - In the same project



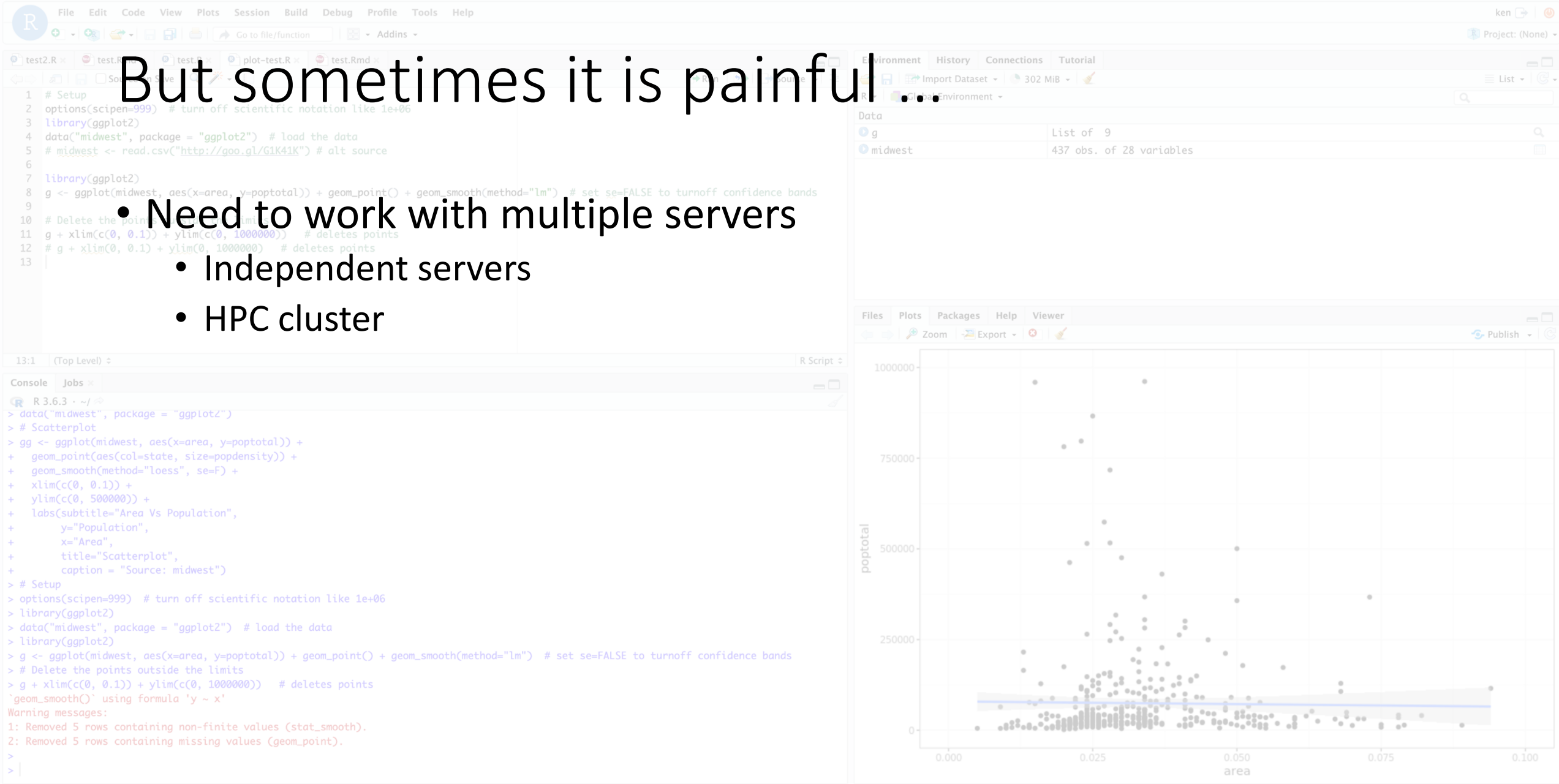
But sometimes it is painful …

- Need to work with multiple programming languages
  - C++ for better performance
  - R for easier programming and analysis
  - HTML/CSS/JavaScript for shiny apps



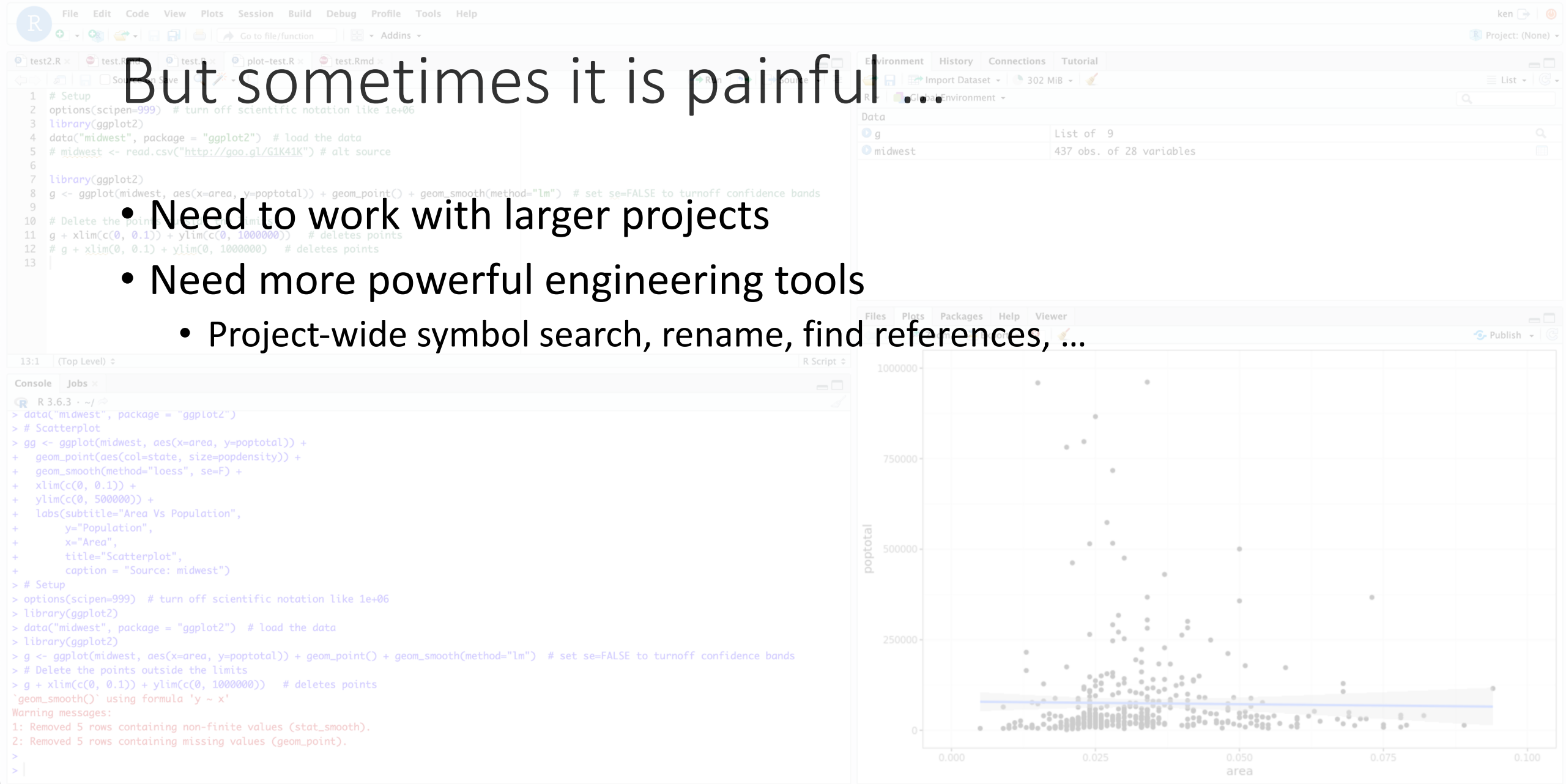
But sometimes it is painful …

- Need to work with multiple servers
  - Independent servers
  - HPC cluster



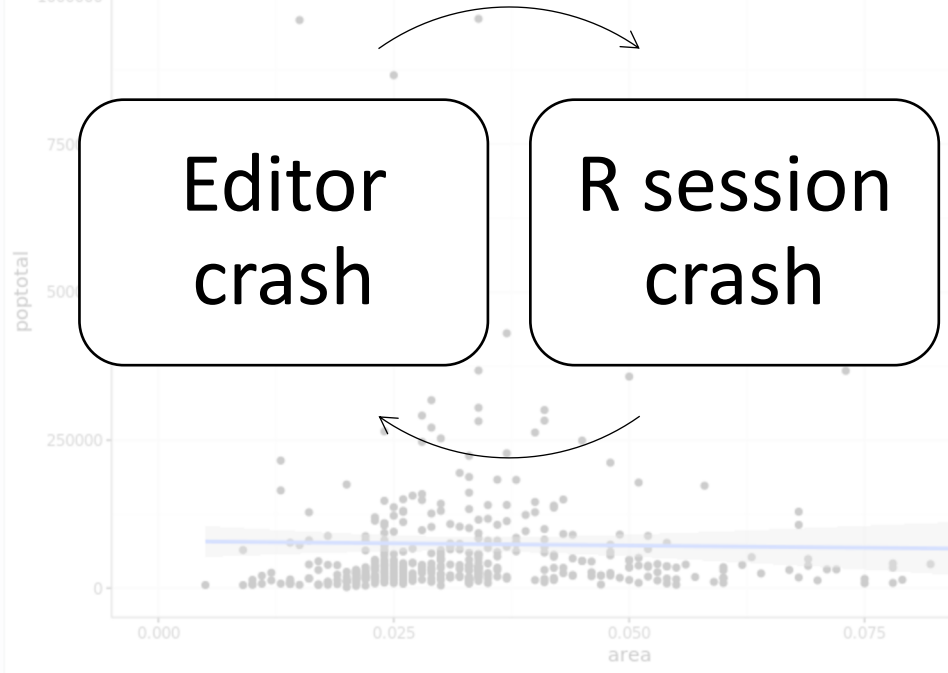
But sometimes it is painful …

- Need to work with larger projects
- Need more powerful engineering tools
  - Project-wide symbol search, rename, find references, …



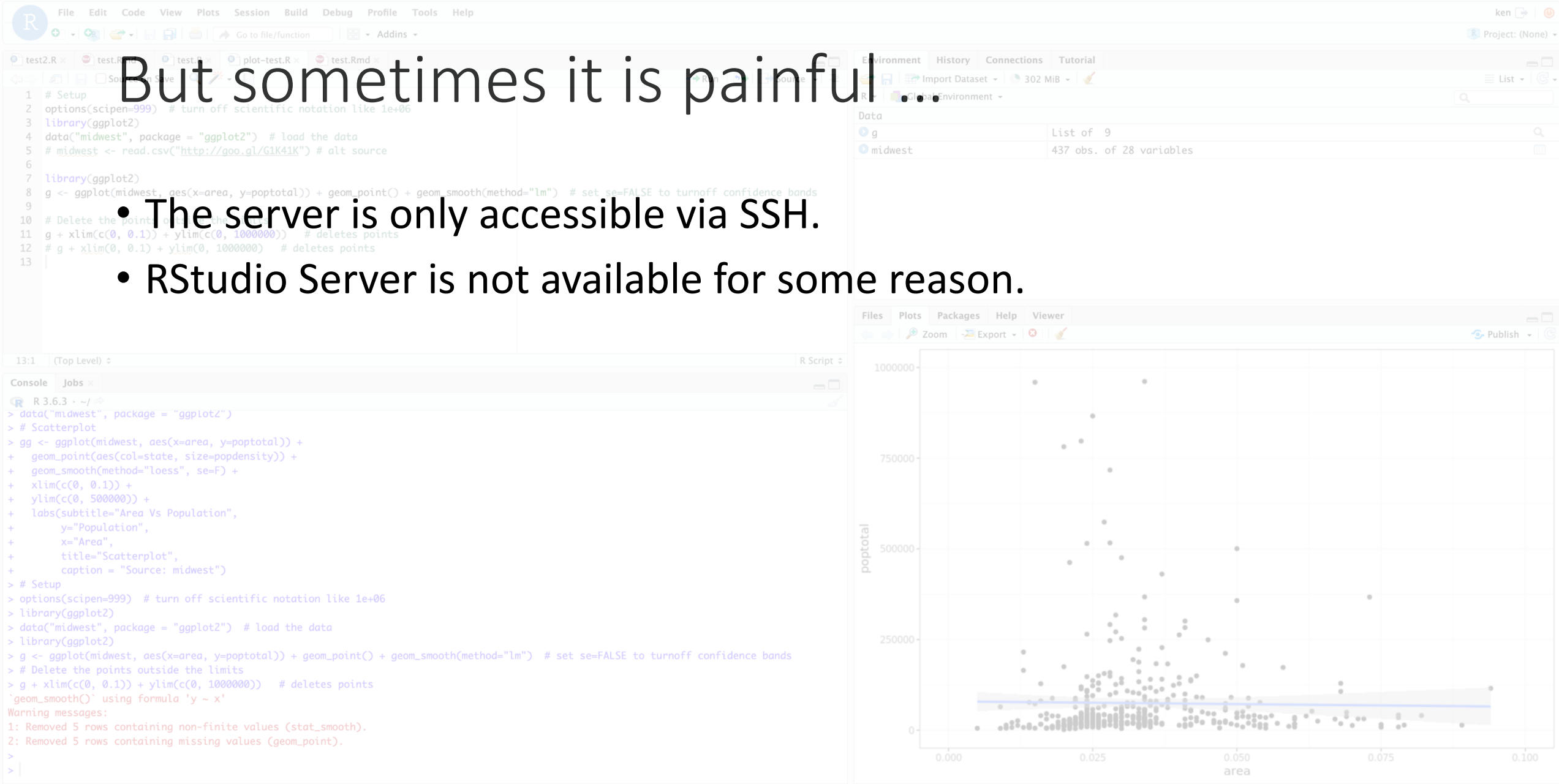
But sometimes it is painful …

- Possible loss of code when editor crashes
  - Heavy parallel computing using socket cluster or fork
  - C/C++ segfaults



But sometimes it is painful …

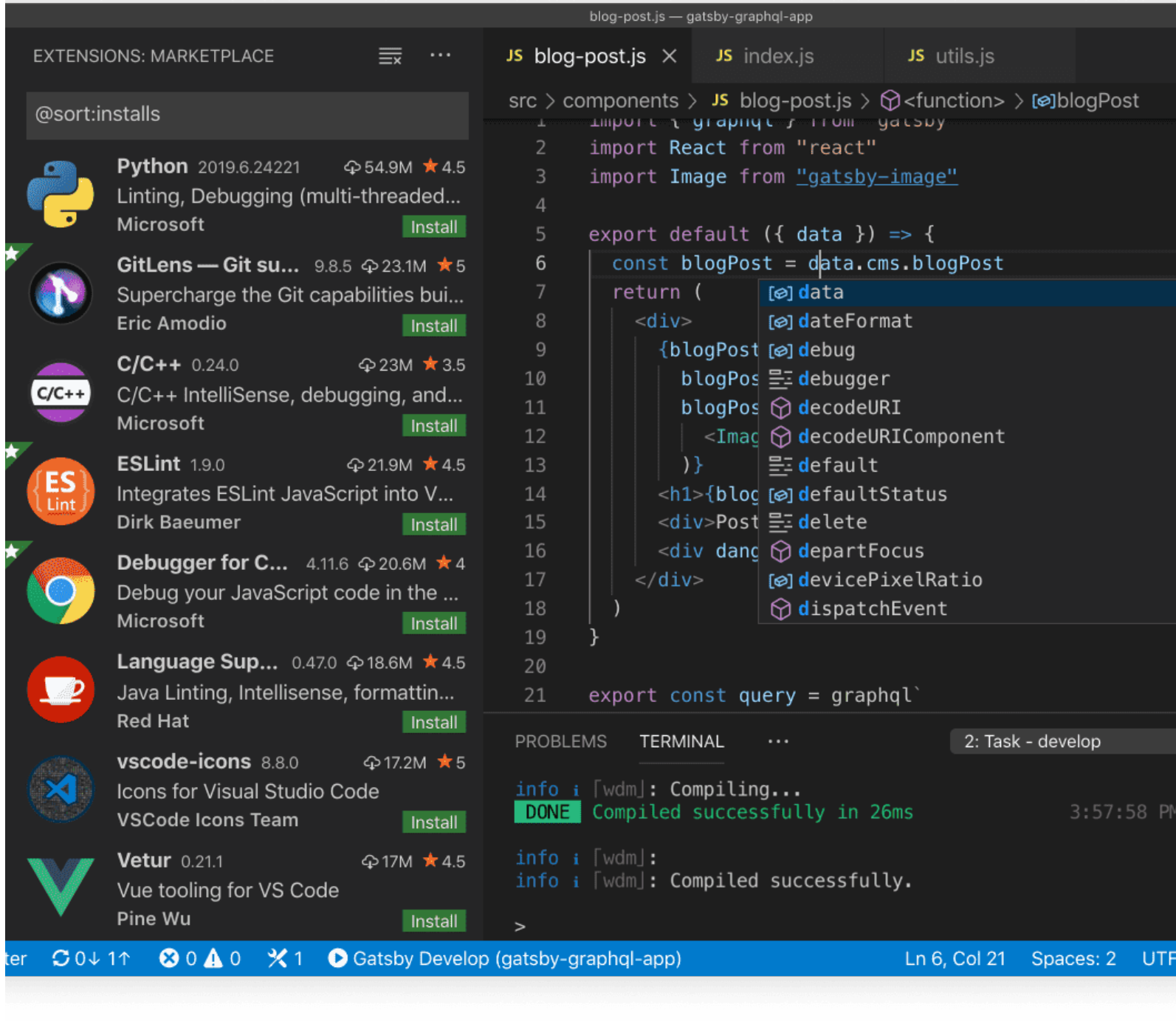
- The server is only accessible via SSH.
- RStudio Server is not available for some reason.



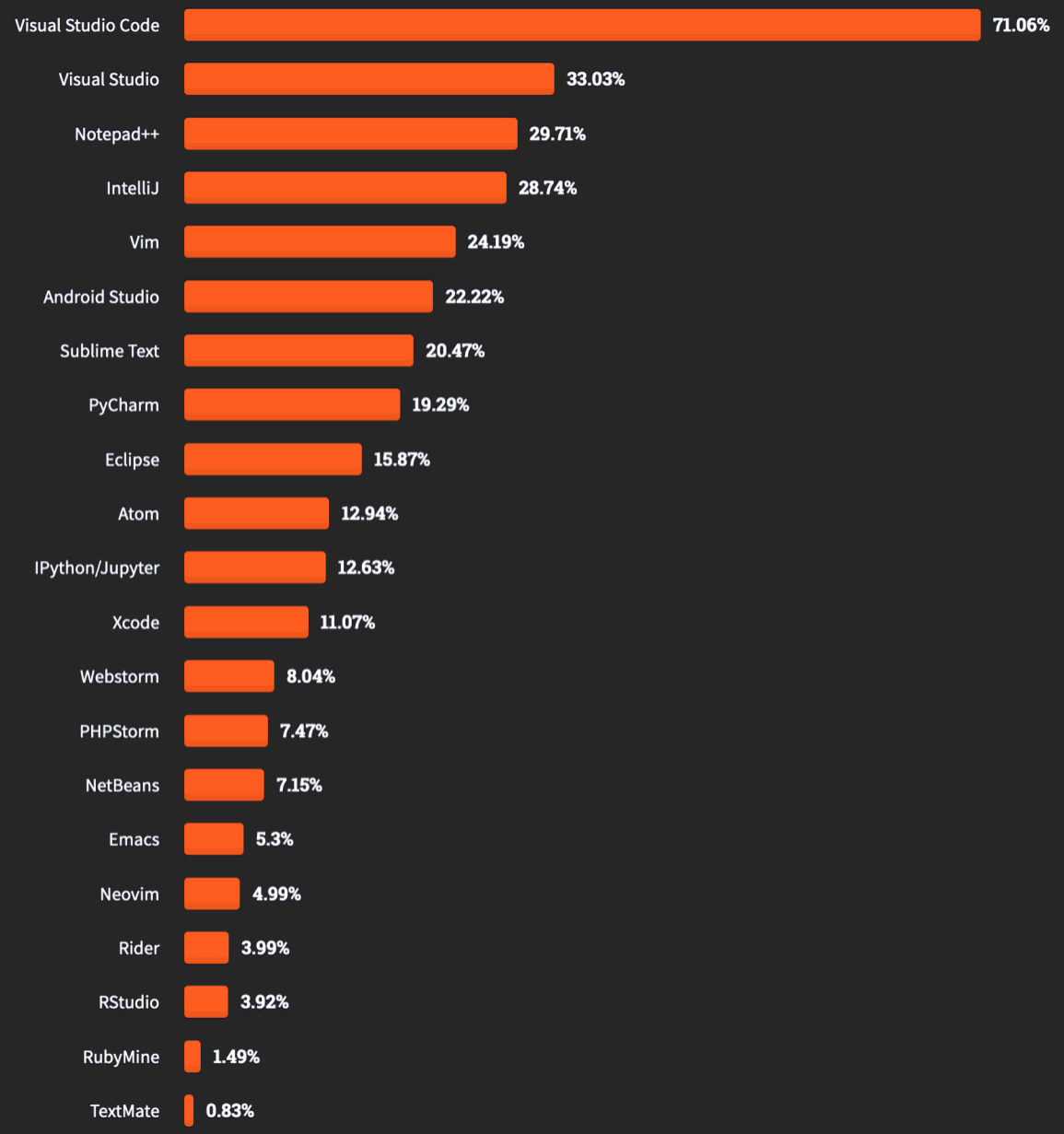
Visual Studio Code

Visual Studio Code

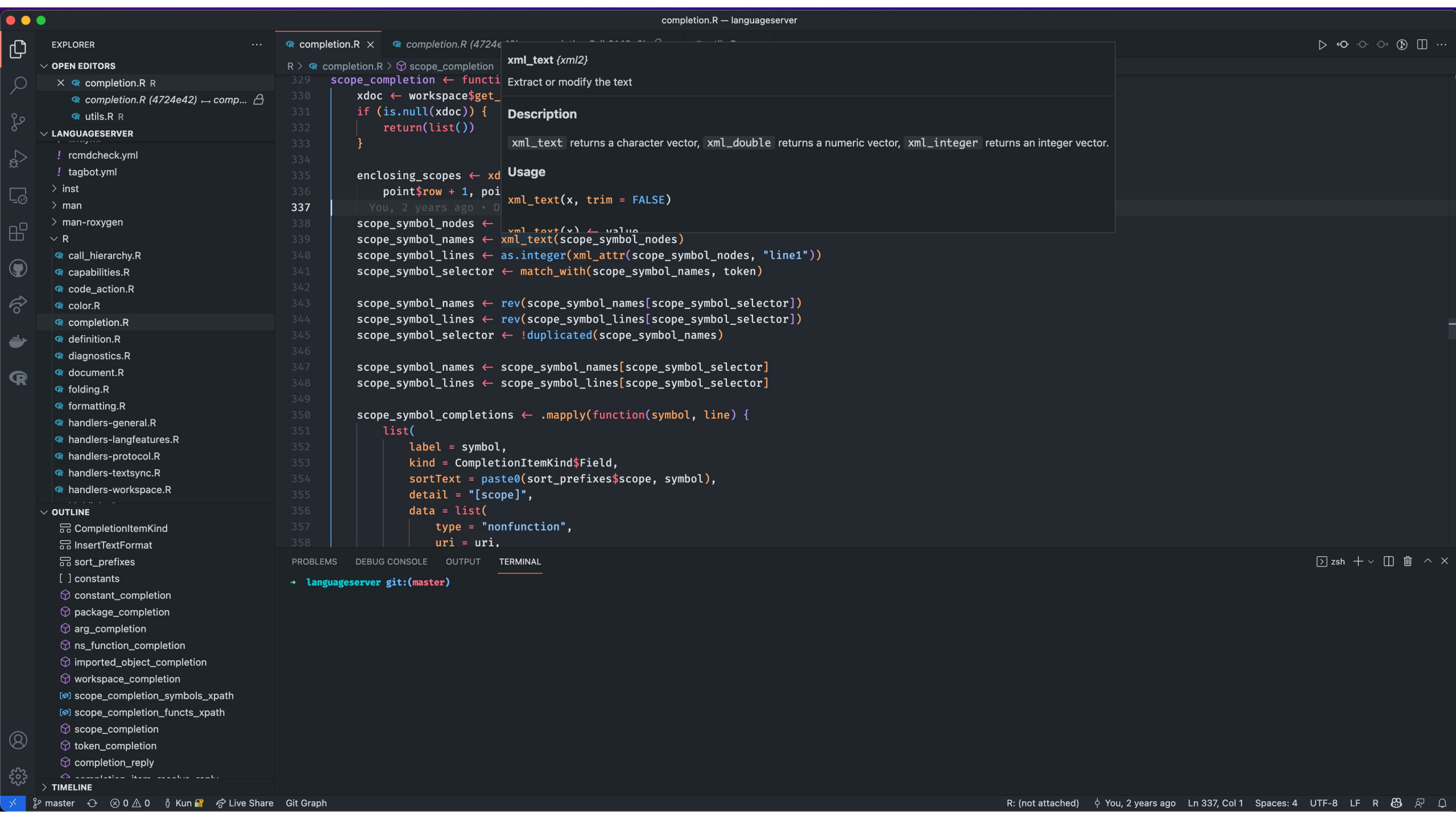
- Syntax highlight: many languages
- Language Server Protocol
- Debug Adapter Protocol
- Full-featured language supports: C/C++, C#, Java, Python, JavaScript, TypeScript, etc.
- Built-in Git support
- Tons of extensions
- Remote Development via SSH, WSL, and Docker
- Live collaboration

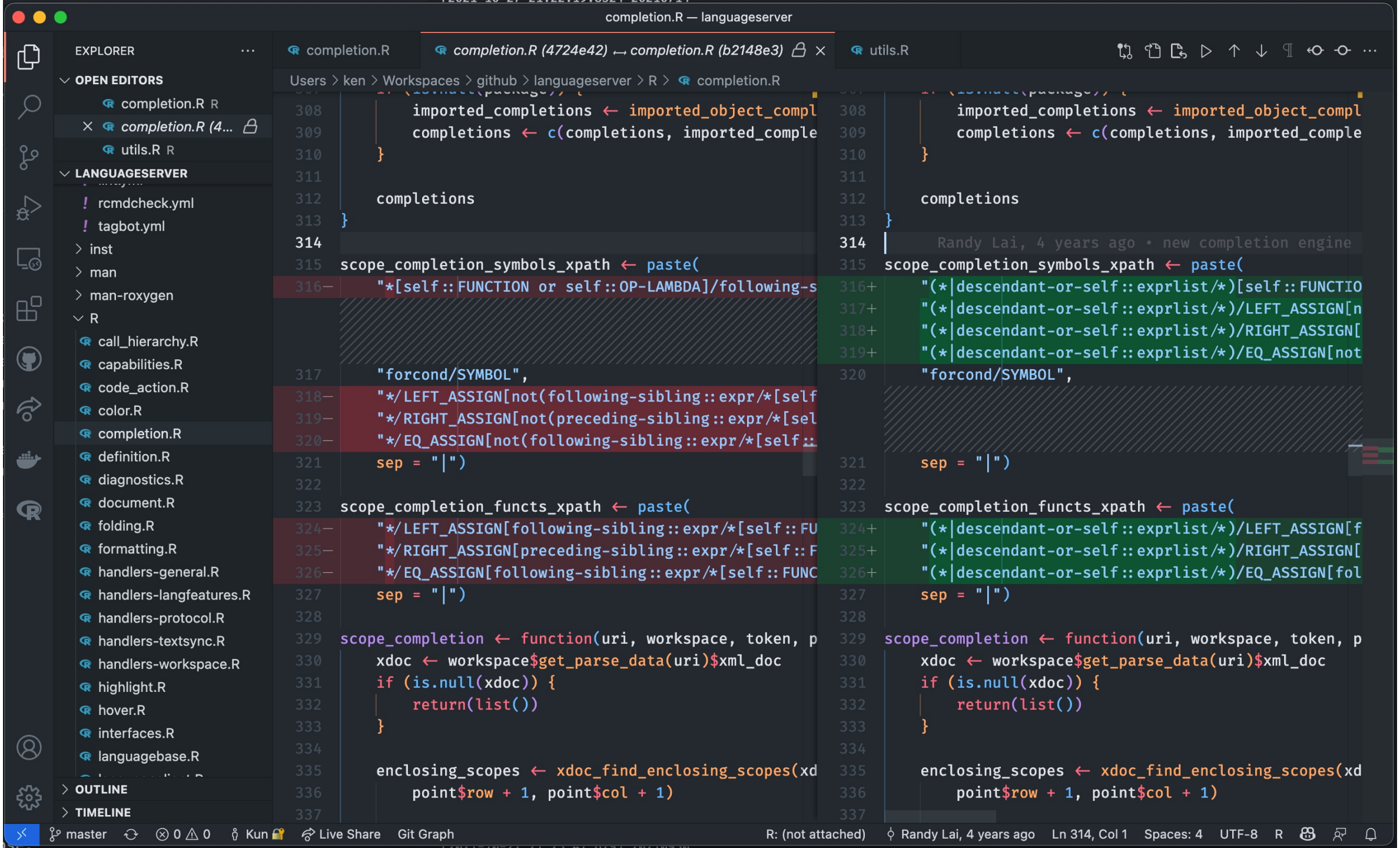


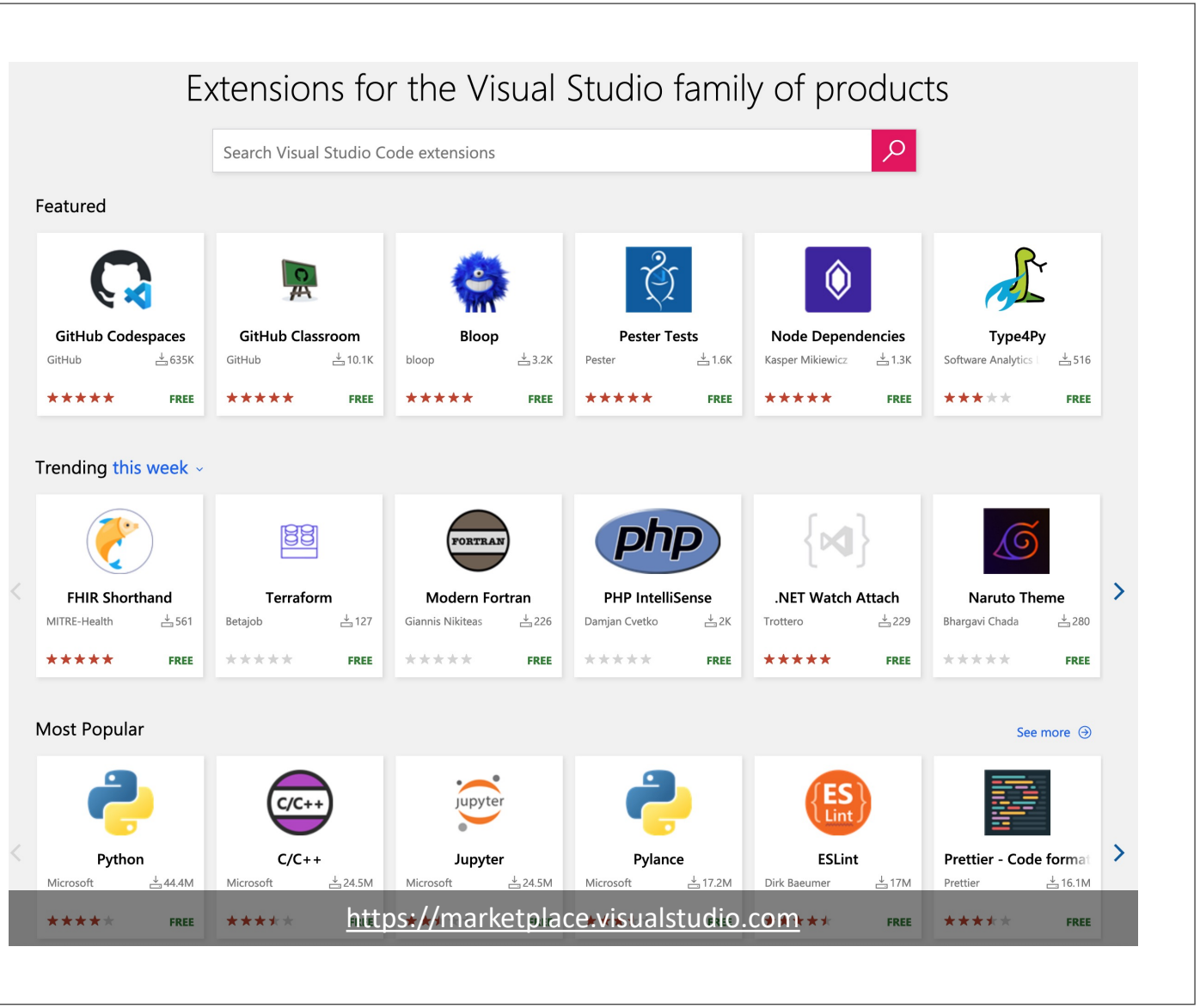
Stack Overflow Developer Survey 2021



https://insights.stackoverflow.com/survey/2021#integrated-development-environment


completion.R — languageserver
EXPLORER
OPEN EDITORS
completion.R R
completion.R (4724e42) ⟷ comp...
utils.R R
LANGUAGESERVER
rcmdcheck.yml
tagbot.yml
inst
man
man-roxygen
R
call_hierarchy.R
capabilities.R
code_action.R
color.R
completion.R
definition.R
diagnostics.R
document.R
folding.R
formatting.R
handlers-general.R
handlers-langfeatures.R
handlers-protocol.R
handlers-textsync.R
handlers-workspace.R
OUTLINE
CompletionItemKind
InsertTextFormat
sort_prefixes
constants
constant_completion
package_completion
arg_completion
ns_function_completion
imported_object_completion
workspace_completion
scope_completion_symbols_xpath
scope_completion_functs_xpath
scope_completion
token_completion
completion_reply
TIMELINE
completion.R
completion.R (4724e
R > completion.R > scope_completion
xml_text {xml2}
Extract or modify the text
Description
xml_text returns a character vector, xml_double returns a numeric vector, xml_integer returns an integer vector.
Usage
xml_text(x, trim = FALSE)
xml_text(x) <- value
329 scope_completion <- functi
330 xdoc <- workspace$get_
331 if (is.null(xdoc)) {
332 return(list())
333 }
334
335 enclosing_scopes <- xd
336 point$row + 1, poi
337 You, 2 years ago • D
338 scope_symbol_nodes <-
339 scope_symbol_names <- xml_text(scope_symbol_nodes)
340 scope_symbol_lines <- as.integer(xml_attr(scope_symbol_nodes, "line1"))
341 scope_symbol_selector <- match_with(scope_symbol_names, token)
342
343 scope_symbol_names <- rev(scope_symbol_names[scope_symbol_selector])
344 scope_symbol_lines <- rev(scope_symbol_lines[scope_symbol_selector])
345 scope_symbol_selector <- !duplicated(scope_symbol_names)
346
347 scope_symbol_names <- scope_symbol_names[scope_symbol_selector]
348 scope_symbol_lines <- scope_symbol_lines[scope_symbol_selector]
349
350 scope_symbol_completions <- .mapply(function(symbol, line) {
351 list(
352 label = symbol,
353 kind = CompletionItemKind$Field,
354 sortText = paste0(sort_prefixes$scope, symbol),
355 detail = "[scope]",
356 data = list(
357 type = "nonfunction",
358 uri = uri,
PROBLEMS
DEBUG CONSOLE
OUTPUT
TERMINAL
zsh
→ languageserver git:(master)
master
0 0
Kun
Live Share
Git Graph
R: (not attached)
You, 2 years ago
Ln 337, Col 1
Spaces: 4
UTF-8
LF
R


completion.R — languageserver
EXPLORER
OPEN EDITORS
completion.R R
completion.R (4...
utils.R R
LANGUAGESERVER
rcmdcheck.yml
tagbot.yml
inst
man
man-roxygen
R
call_hierarchy.R
capabilities.R
code_action.R
color.R
completion.R
definition.R
diagnostics.R
document.R
folding.R
formatting.R
handlers-general.R
handlers-langfeatures.R
handlers-protocol.R
handlers-textsync.R
handlers-workspace.R
highlight.R
hover.R
interfaces.R
languagebase.R
OUTLINE
TIMELINE
completion.R
completion.R (4724e42) ⟷ completion.R (b2148e3)
utils.R
Users > ken > Workspaces > github > languageserver > R > completion.R
imported_completions ← imported_object_compl
completions ← c(completions, imported_comple
completions
scope_completion_symbols_xpath ← paste(
"*[self::FUNCTION or self::OP-LAMBDA]/following-s
"forcond/SYMBOL",
"*/LEFT_ASSIGN[not(following-sibling::expr/*[self
"*/RIGHT_ASSIGN[not(preceding-sibling::expr/*[sel
"*/EQ_ASSIGN[not(following-sibling::expr/*[self::
sep = "|")
scope_completion_functs_xpath ← paste(
"*/LEFT_ASSIGN[following-sibling::expr/*[self::FU
"*/RIGHT_ASSIGN[preceding-sibling::expr/*[self::F
"*/EQ_ASSIGN[following-sibling::expr/*[self::FUNC
sep = "|")
scope_completion ← function(uri, workspace, token, p
xdoc ← workspace$get_parse_data(uri)$xml_doc
if (is.null(xdoc)) {
return(list())
}
enclosing_scopes ← xdoc_find_enclosing_scopes(xd
point$row + 1, point$col + 1)
Randy Lai, 4 years ago • new completion engine
"(*|descendant-or-self::exprlist/*)[self::FUNCTIO
"(*|descendant-or-self::exprlist/*)/LEFT_ASSIGN[n
"(*|descendant-or-self::exprlist/*)/RIGHT_ASSIGN[
"(*|descendant-or-self::exprlist/*)/EQ_ASSIGN[not
"(*|descendant-or-self::exprlist/*)/LEFT_ASSIGN[f
"(*|descendant-or-self::exprlist/*)/RIGHT_ASSIGN[
"(*|descendant-or-self::exprlist/*)/EQ_ASSIGN[fol
master
0 0
Kun
Live Share
Git Graph
R: (not attached)
Randy Lai, 4 years ago
Ln 314, Col 1
Spaces: 4
UTF-8
R



VS Code Marketplace

R

WORKSPACE

- g List of 9
- gg List of 9
- midwest tbl_df: 437 obs. of 28 variables
- midwest_select tbl_df: 6 obs. of 28 variables
- mpg tbl_df: 234 obs. of 11 variables
  - $ manufacturer: chr [1:234] "audi" ...
  - $ model : chr [1:234] "a4" ...
  - $ displ : num [1:234] 1.8 1.8 ...
  - $ year : int [1:234] 1999 1999 ...
  - $ cyl : int [1:234] 4 4 ...
  - $ trans : chr [1:234] "auto(l5)" ...
  - $ drv : chr [1:234] "f" ...
  - $ cty : int [1:234] 18 21 ...
  - $ hwy : int [1:234] 29 29 ...
  - $ fl : chr [1:234] "p" ...
  - $ class : chr [1:234] "compact" ...

HELP PAGES

- Home
- Open Help Topic using `?`
- Search Help Topics using `??`
- Open Help Page for Selected Text
- Clear Cached Index Files & Restart Hel...
- Install CRAN Package
- Help Topics by Package

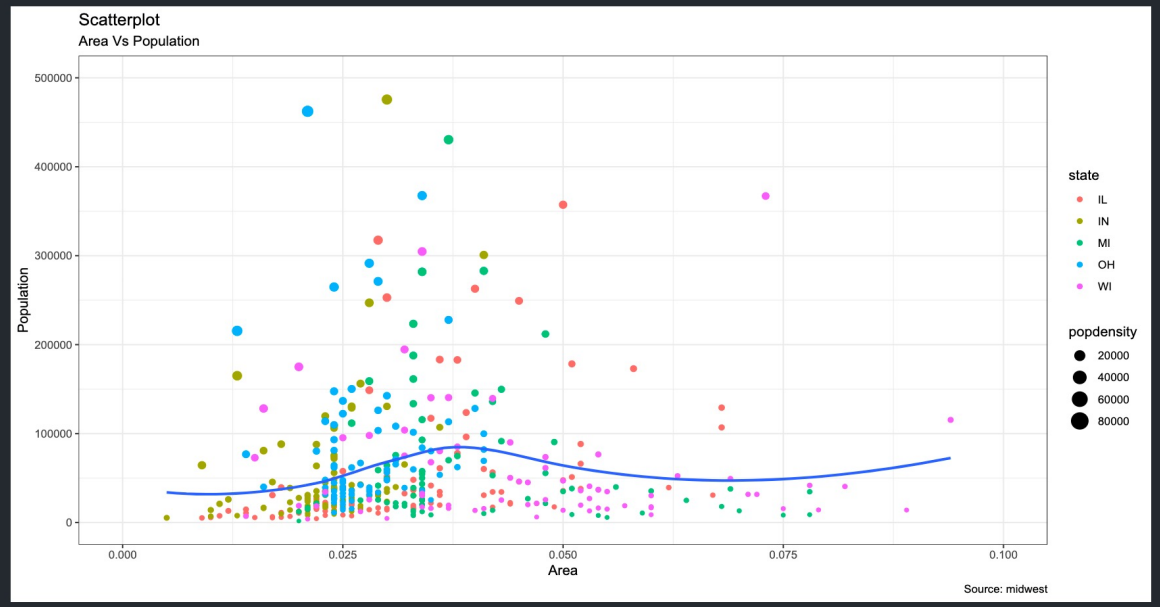
LIVE SHARE CONTROLS

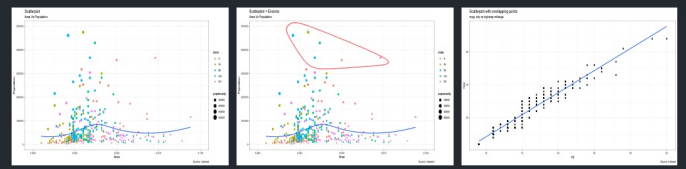
plot-test.R | .Rprofile | data.R

plot-test.R > ...

```r
# install.packages("ggplot2")
# load package and data
options(scipen = 999) # turn-off scientific notation like 1e+48
library(ggplot2)
theme_set(theme_bw()) # pre-set the bw theme.
data("midwest", package = "ggplot2")
# midwest <- read.csv("http://goo.gl/G1K41K")  # bkup data source

# Scatterplot
gg <- ggplot(midwest, aes(x = area, y = poptotal)) +
  geom_point(aes(col = state, size = popdensity)) +
  geom_smooth(method = "loess", se = FALSE) +
  xlim(c(0, 0.1)) +
  ylim(c(0, 500000)) +
  labs(subtitle = "Area Vs Population",
    y = "Population",
    x = "Area",
    title = "Scatterplot",
```

R Plot | R Plot





PROBLEMS 22 | DEBUG CONSOLE | TERMINAL | Python

```r
# Scatterplot
gg <- ggplot(midwest, aes(x = area, y = poptotal)) +
  geom_point(aes(col = state, size = popdensity)) +
  geom_smooth(method = "loess", se = FALSE) +
  xlim(c(0, 0.1)) +
  ylim(c(0, 500000)) +
  labs(subtitle = "Area Vs Population",
    y = "Population",
    x = "Area",
    title = "Scatterplot",
    caption = "Source: midwest")

plot(gg)
```

```
Need help getting started? Try the R Graphics Cookbok: https://r-graphics.org
`geom_smooth()` using formula 'y ~ x'
Warning messages:
1: Removed 15 rows containing non-finite values (stat_smooth).
2: Removed 15 rows containing missing values (geom_point).
```

```r
> options(scipen = 999)
  library(ggplot2)
  library(ggalt)
  midwest_select <- midwest[midwest$poptotal > 350000 &
    midwest$poptotal <= 500000 &
    midwest$area > 0.01 &
    midwest$area < 0.1, ]

  # Plot
  ggplot(midwest, aes(x = area, y = poptotal)) +
    geom_point(aes(col = state, size = popdensity)) + # draw points
    geom_smooth(method = "loess", se = F) +
    xlim(c(0, 0.1)) +
    ylim(c(0, 500000)) + # draw smoothing line
    geom_encircle(aes(x = area, y = poptotal),
      data = midwest_select,
      color = "red",
      size = 2,
      expand = 0.08) + # encircle
    labs(subtitle = "Area Vs Population",
      y = "Population",
      x = "Area",
      title = "Scatterplot + Encircle",
      caption = "Source: midwest")
```

```
Registered S3 methods overwritten by 'ggalt':
  method                  from
  grid.draw.absoluteGrob  ggplot2
  grobHeight.absoluteGrob ggplot2
  grobWidth.absoluteGrob  ggplot2
  grobX.absoluteGrob      ggplot2
  grobY.absoluteGrob      ggplot2
`geom_smooth()` using formula 'y ~ x'
Warning messages:
1: Removed 15 rows containing non-finite values (stat_smooth).
2: Removed 15 rows containing missing values (geom_point).
```

```r
> # load package and data
  library(ggplot2)


> data(mpg, package = "ggplot2") # alternate source: "http://goo.gl/uEeRGu")


> theme_set(theme_bw()) # pre-set the bw theme.


> g <- ggplot(mpg, aes(cty, hwy))


> # Scatterplot
  g + geom_point() +
    geom_smooth(method = "lm", se = F) +
    labs(subtitle = "mpg: city vs highway mileage",
      y = "hwy",
      x = "cty",
      title = "Scatterplot with overlapping points",
      caption = "Source: midwest")

`geom_smooth()` using formula 'y ~ x'

> 
```

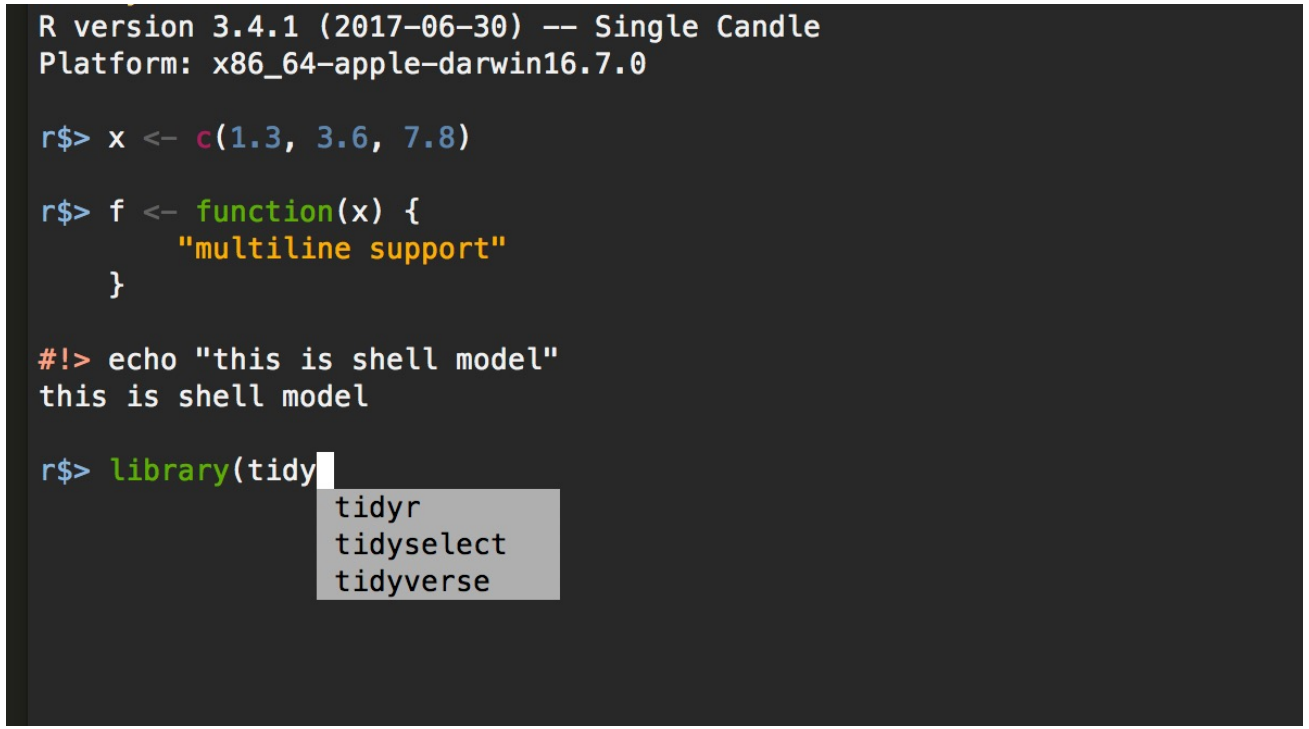
+ vscode-R
+ languageserver + httpgd
+ radian
+ R Debugger
+ some other vscode extensions:
  + Utility extensions like Path Autocomplete
  + C/C++ extension to support Rcpp development and debugging
  + …

radian

A 21st century R console

By Randy Lai

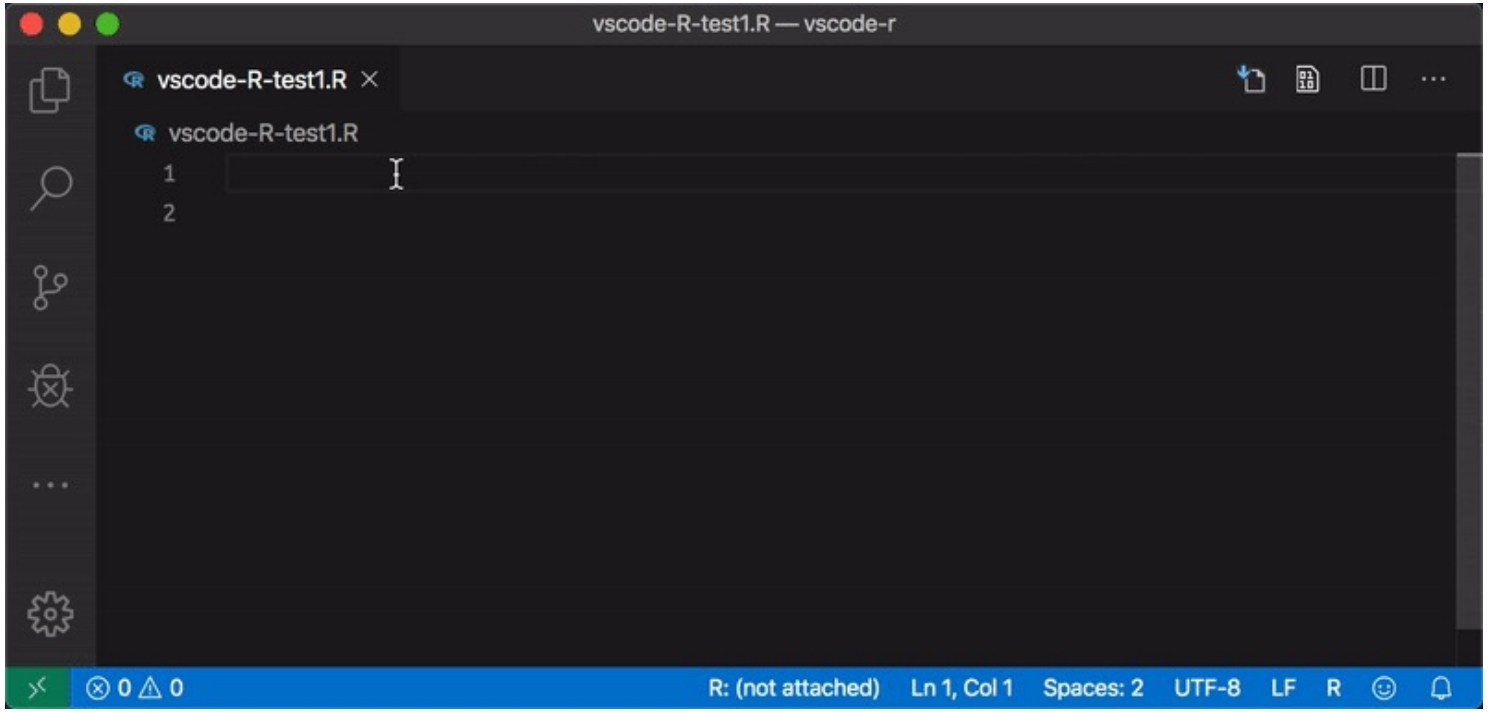
https://github.com/randy3k/radian



Code editing features

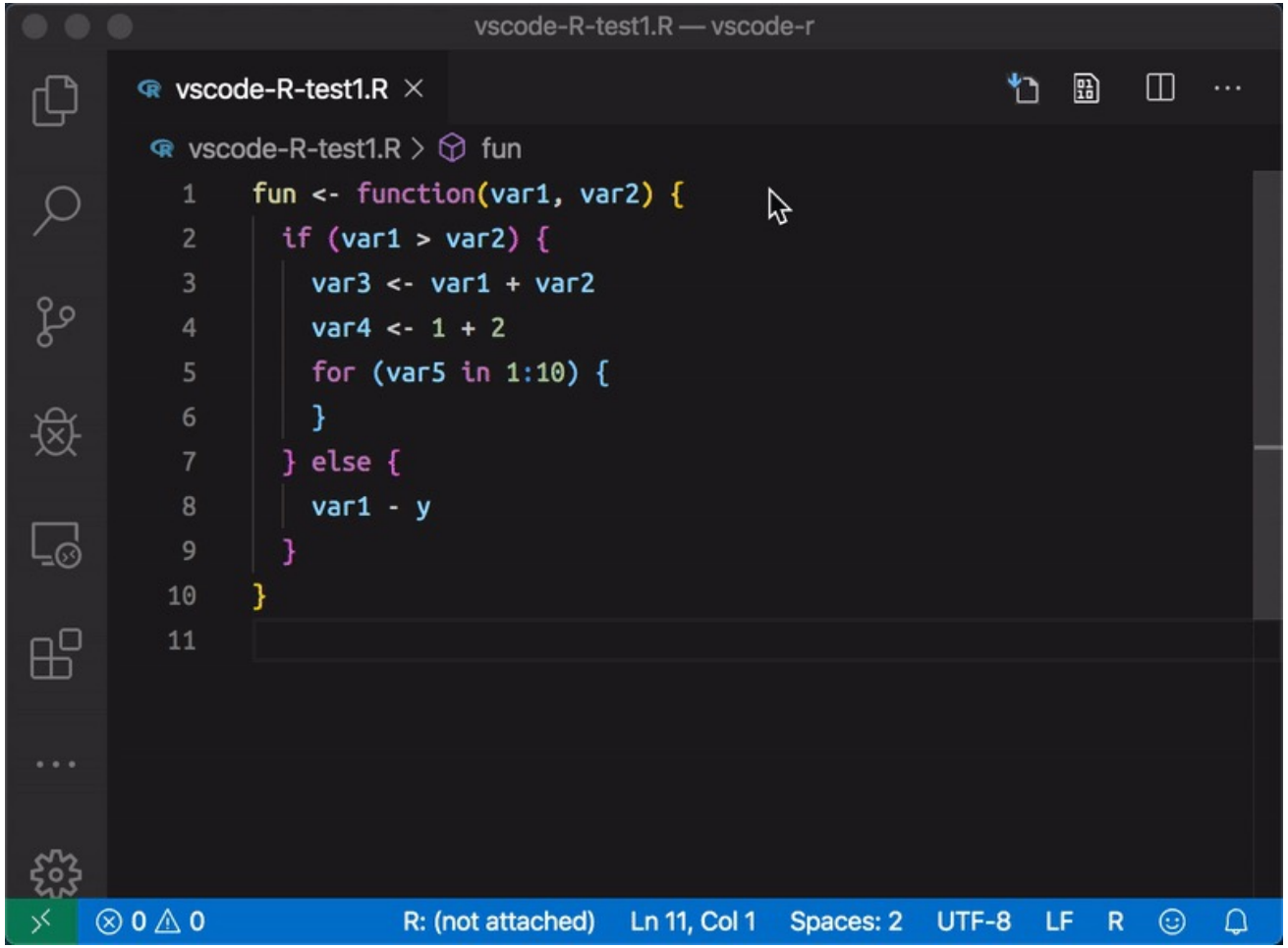
- Powered by R language server
- Based on static code analysis

Completion



- Langauge constants
- Function arguments
- Package names
- Exported objects and functions
- Non-exported objects
- Scope symbols

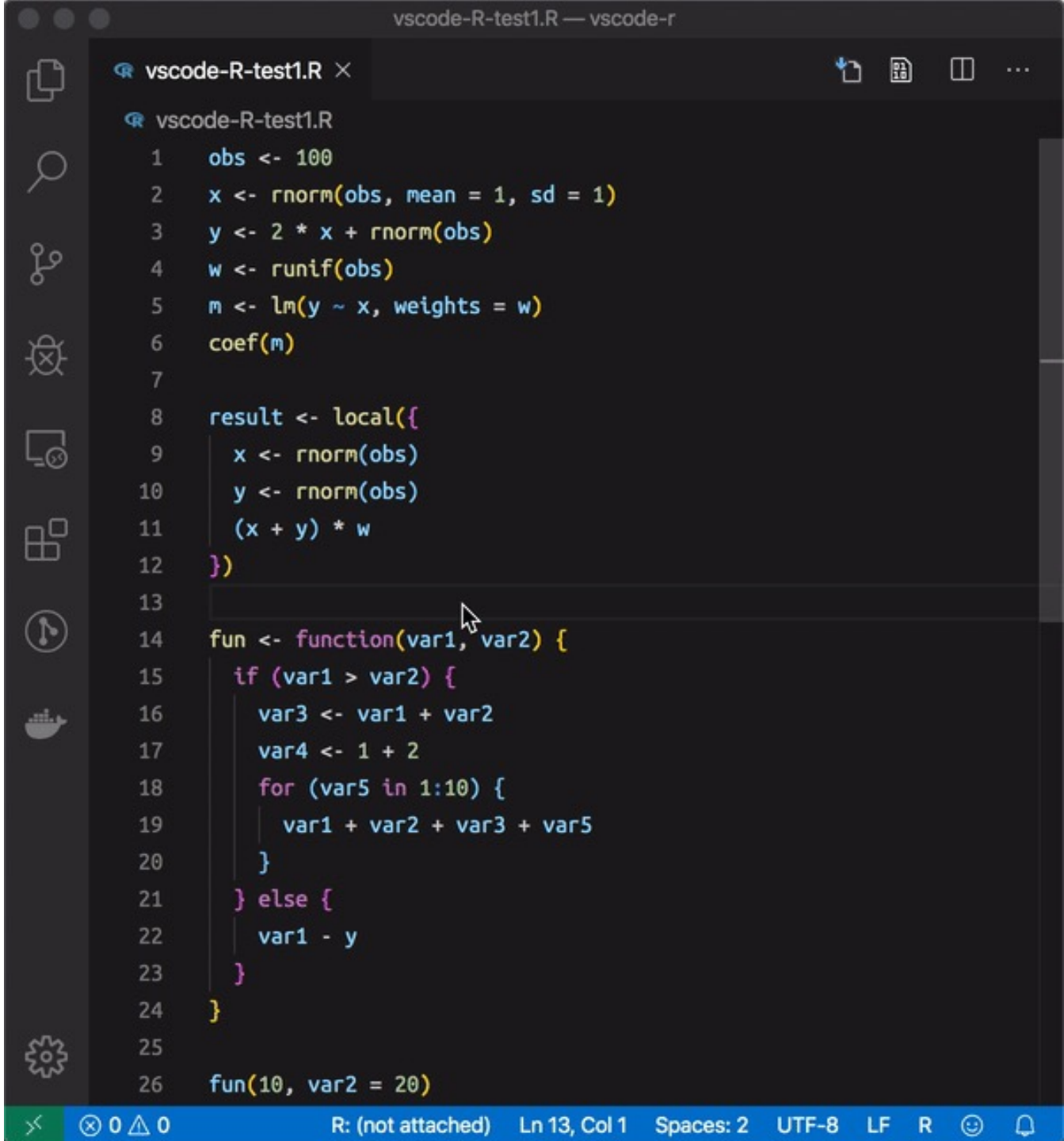
Scope completion



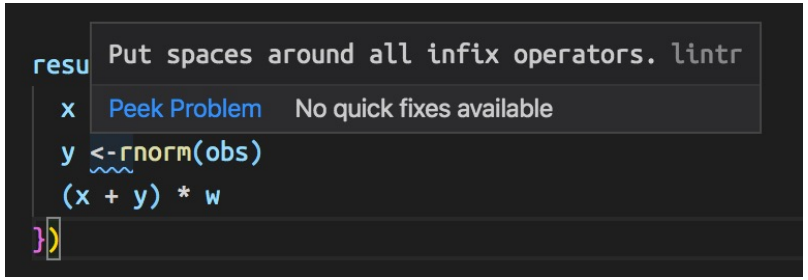
- Function argument
- Local variables
- `for` loop symbol

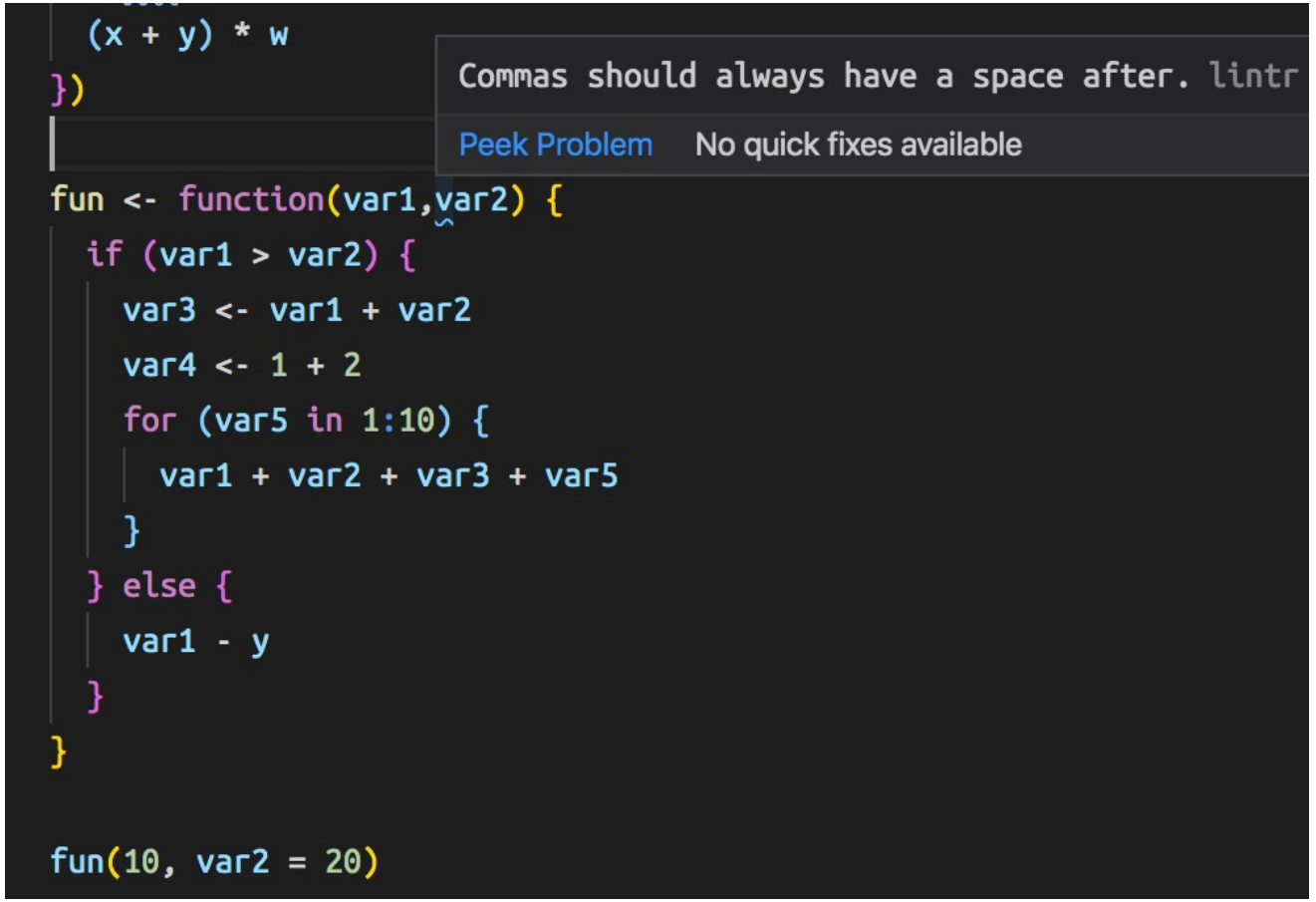
Document highlight

- Highlight selected symbols of the same type in document
- Quickly locate all occurrences of a symbol or token.



Diagnostics based on `lintr`



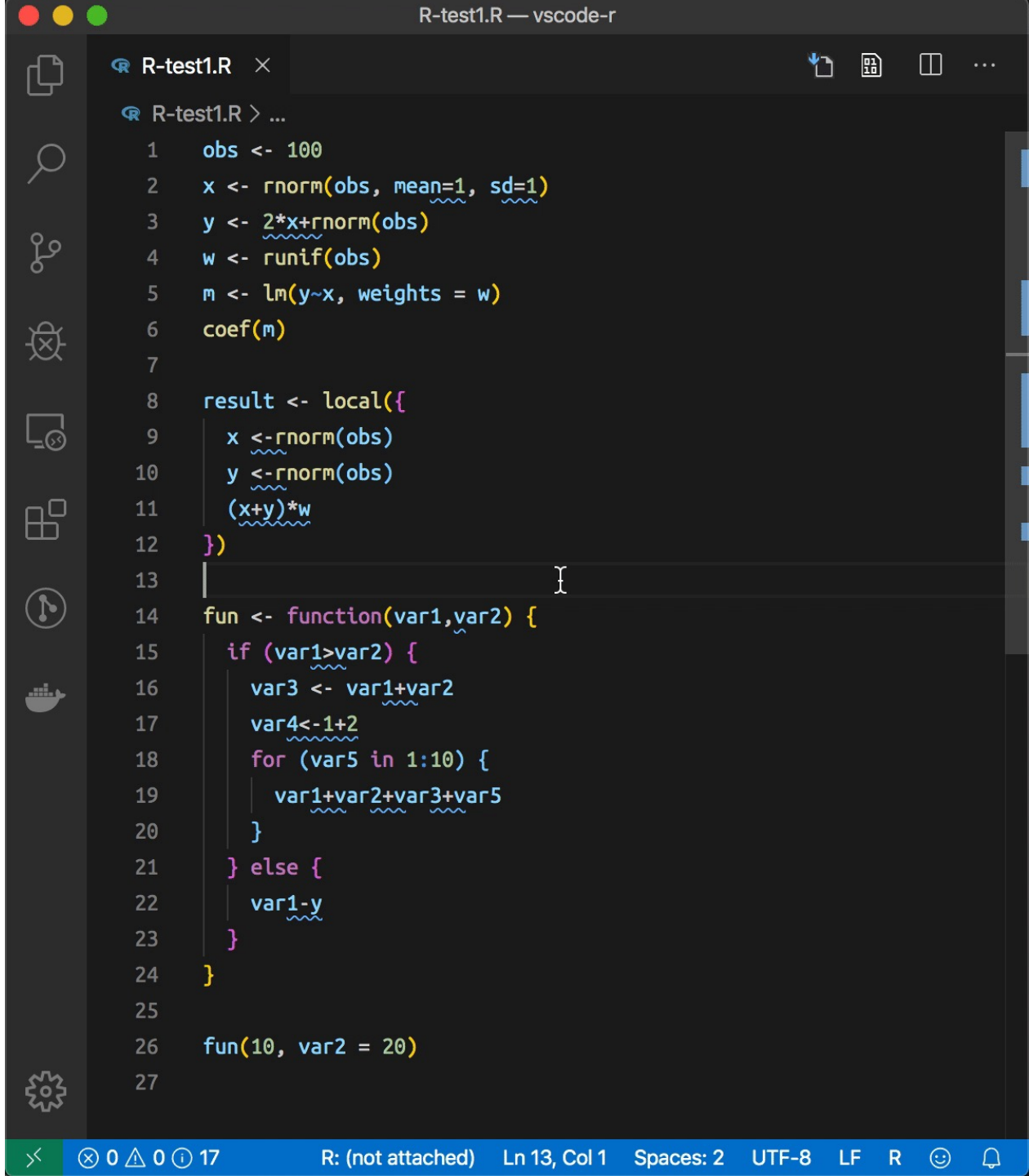


Diagnostics based on `lintr`

```
338     scope_symbol_nodes ← xml_find_all(enclosing_scopes, scope_completion_symbols_xpath)
339     scope_symbol_names ← xml_text(scope_symbol_nodes)
340     scope_symbol_lines ← as.integer(xml_attr(scope_symbol_nodes,"line1"))    Commas should always have a space after.
341     scope_symbol_selector ← match_with(scope_symbol_names, token)
342
343     scope_symbol_names ← rev(scope_symbol_names[scope_symbol_selector])
344     scope_symbol_lines ← rev(scope_symbol_lines[scope_symbol_selector])
345     scope_symbol_selector ← !duplicated(scope_symbol_names:)    unexpected ')'
346       You, a year ago • Show documentation for scope completion items
347     scope_symbol_names ← scope_symbol_names[scope_symbol_selector]
348     scope_symbol_lines ← scope_symbol_lines[scope_symbol_selector]
349
```

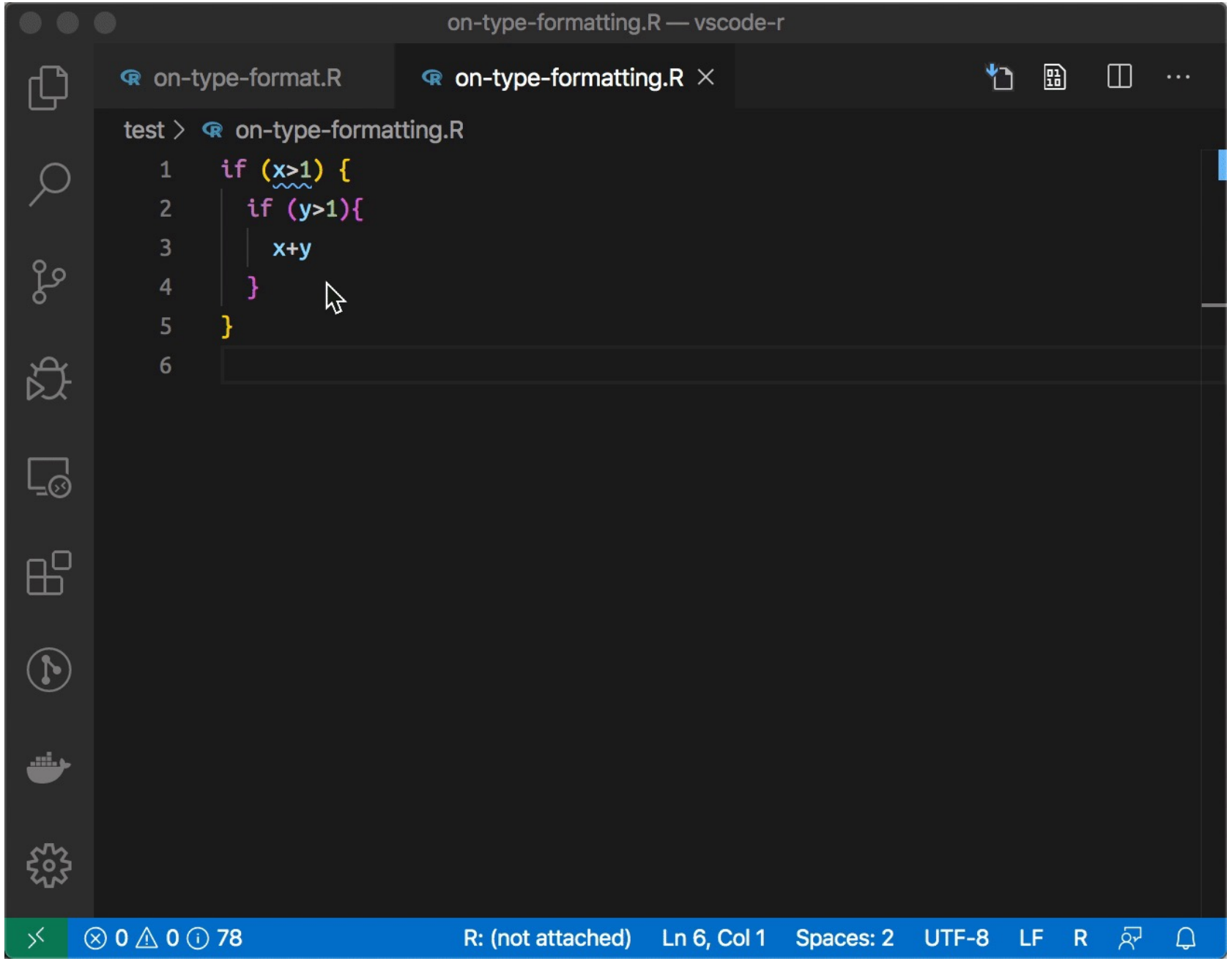
Code formatting

- Customizable formatting by `styler`
- Document formatting

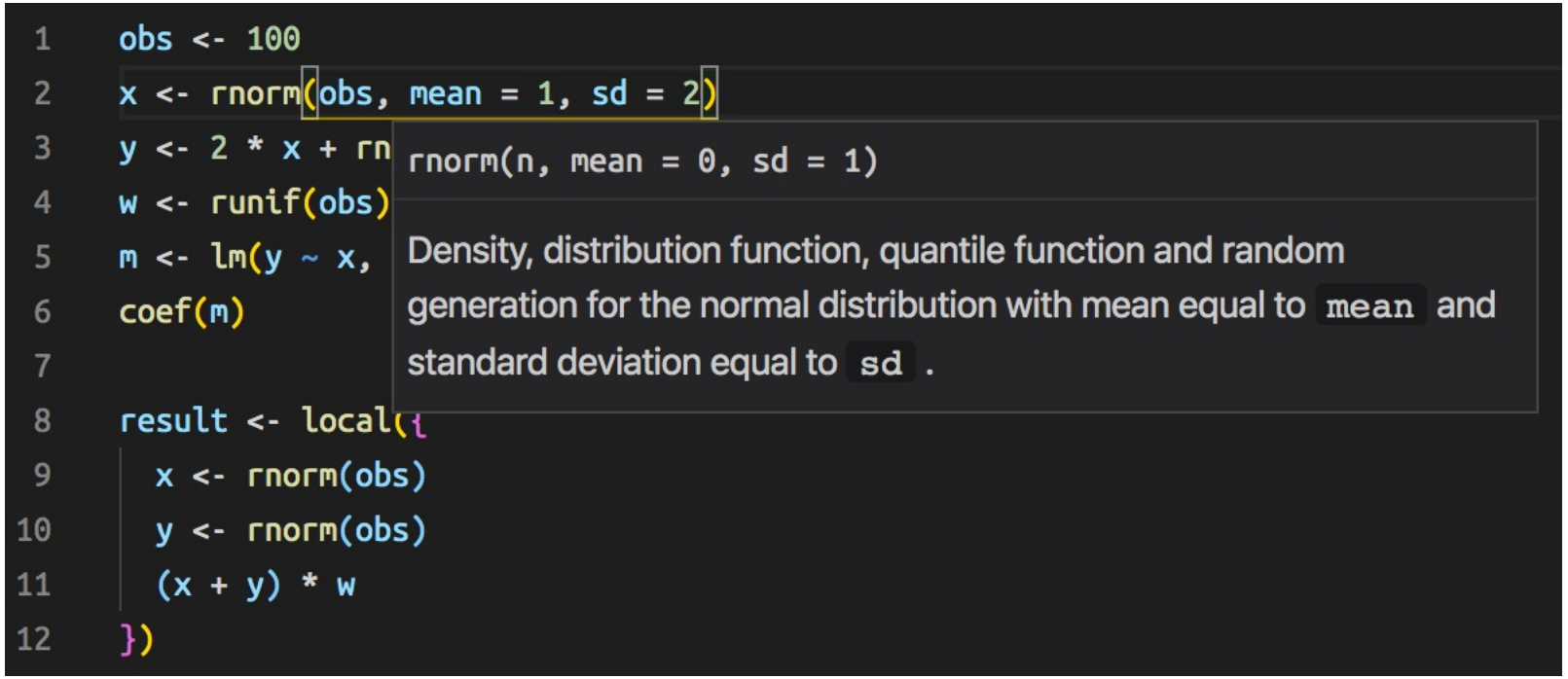


Code formatting

- Range formatting
- On-type formatting

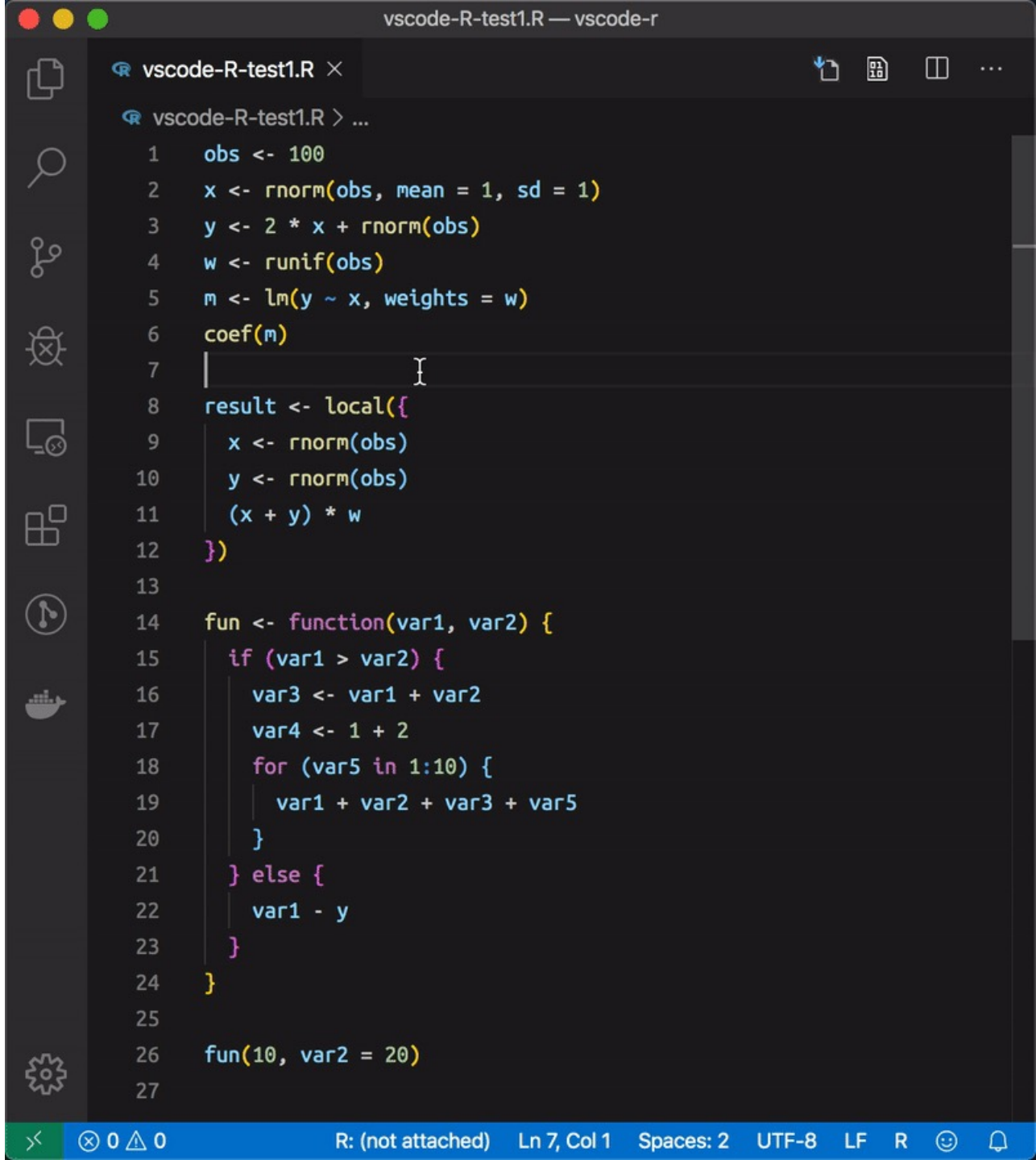


Function Signature



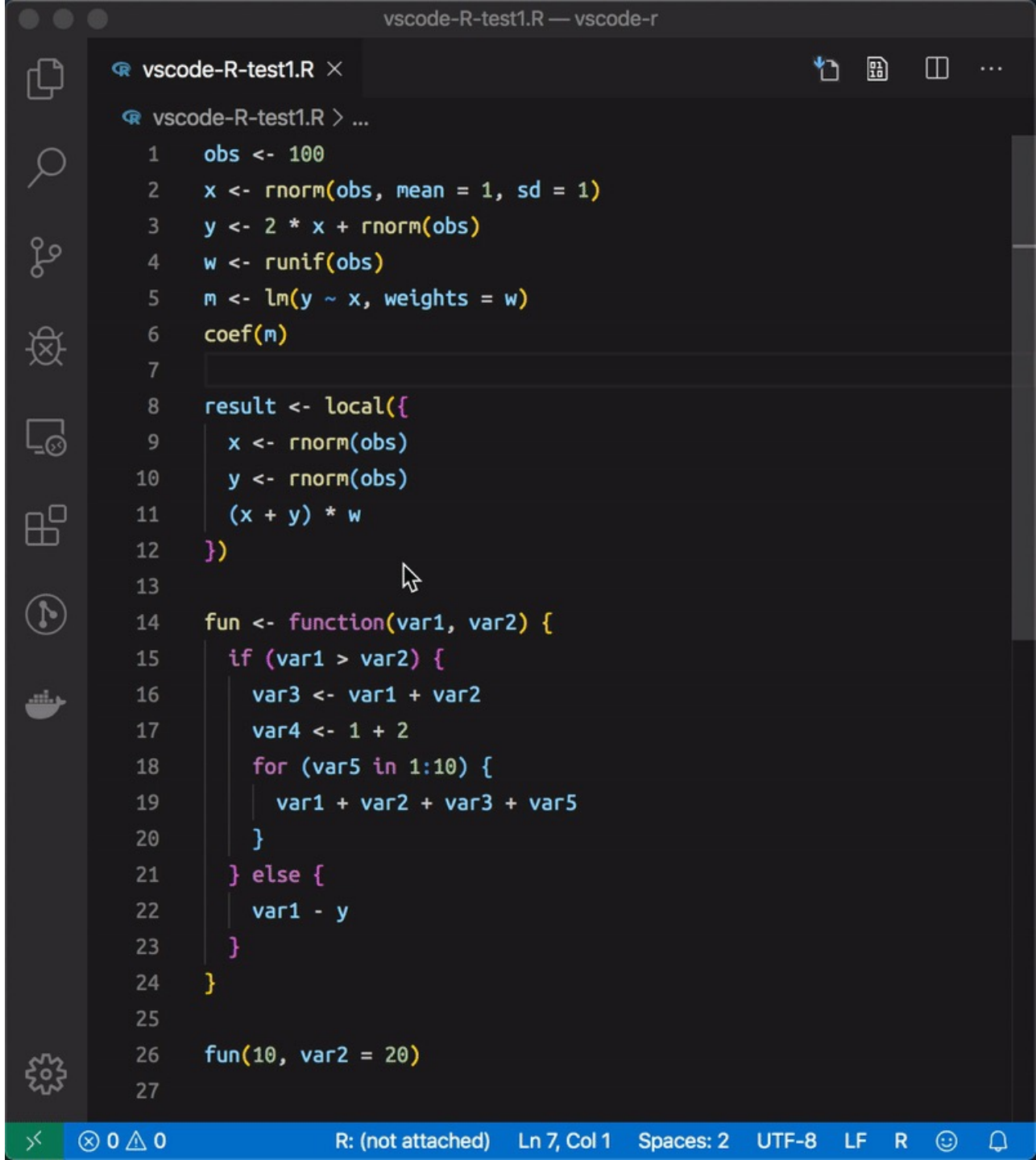
Hover

- Show documentation for function on hover
- Show argument description for function argument on hover
- Show definition of symbols on hover
- Work with both package symbols and document symbols



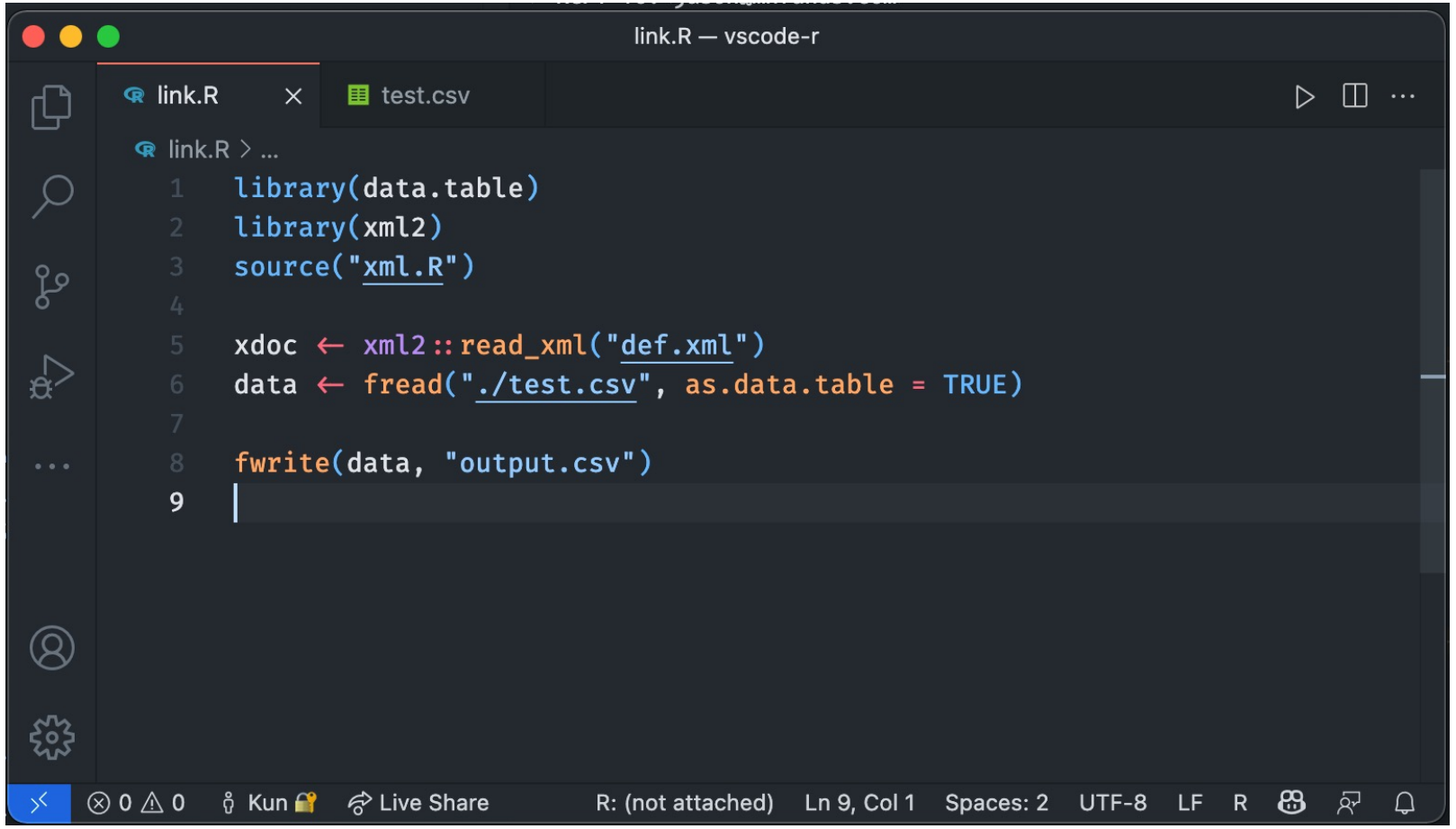
Definition

- Function definition
- Symbol definition
- Quick preview
- Go to definition



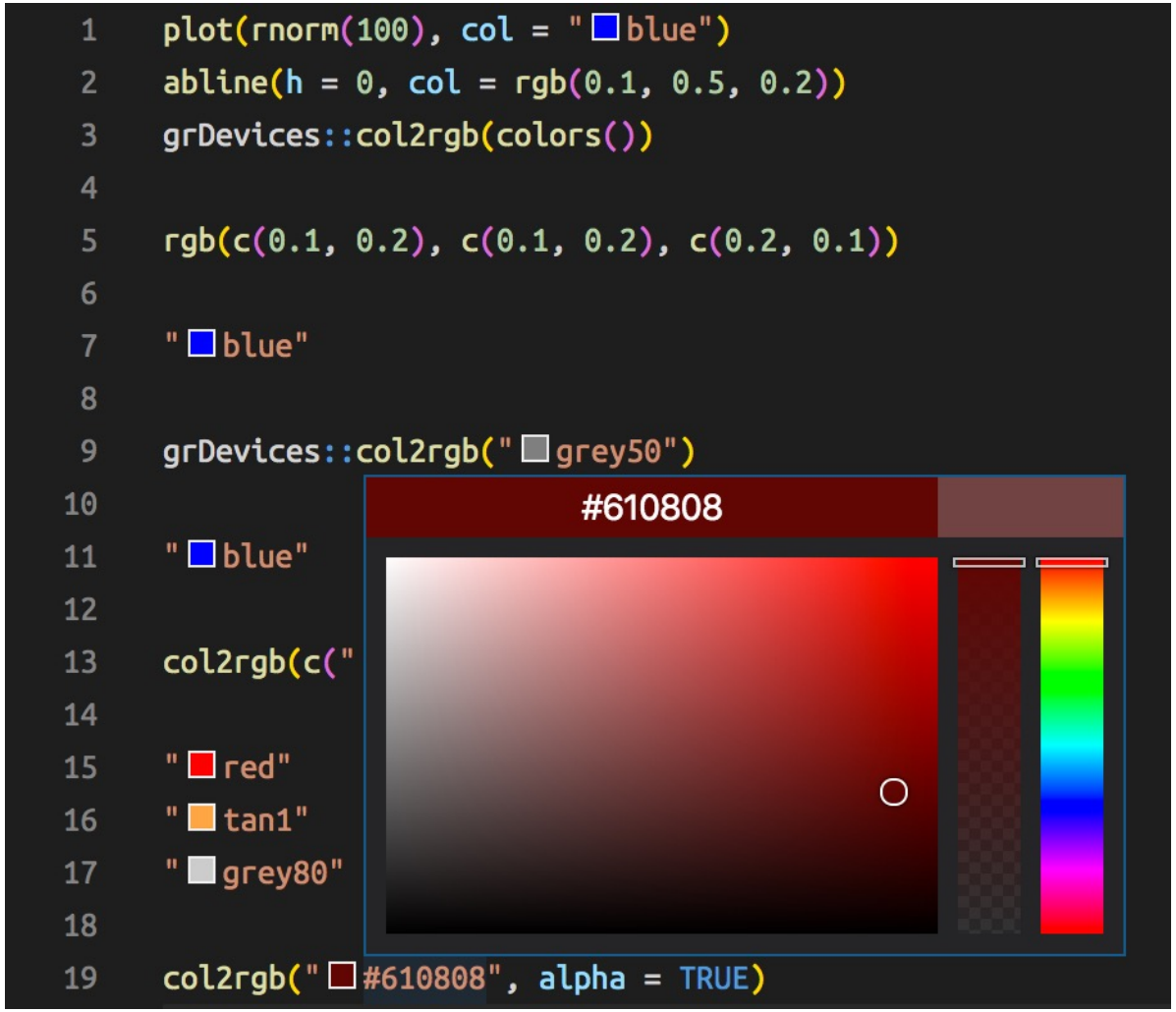
Link

- Underlined path recognized as document links



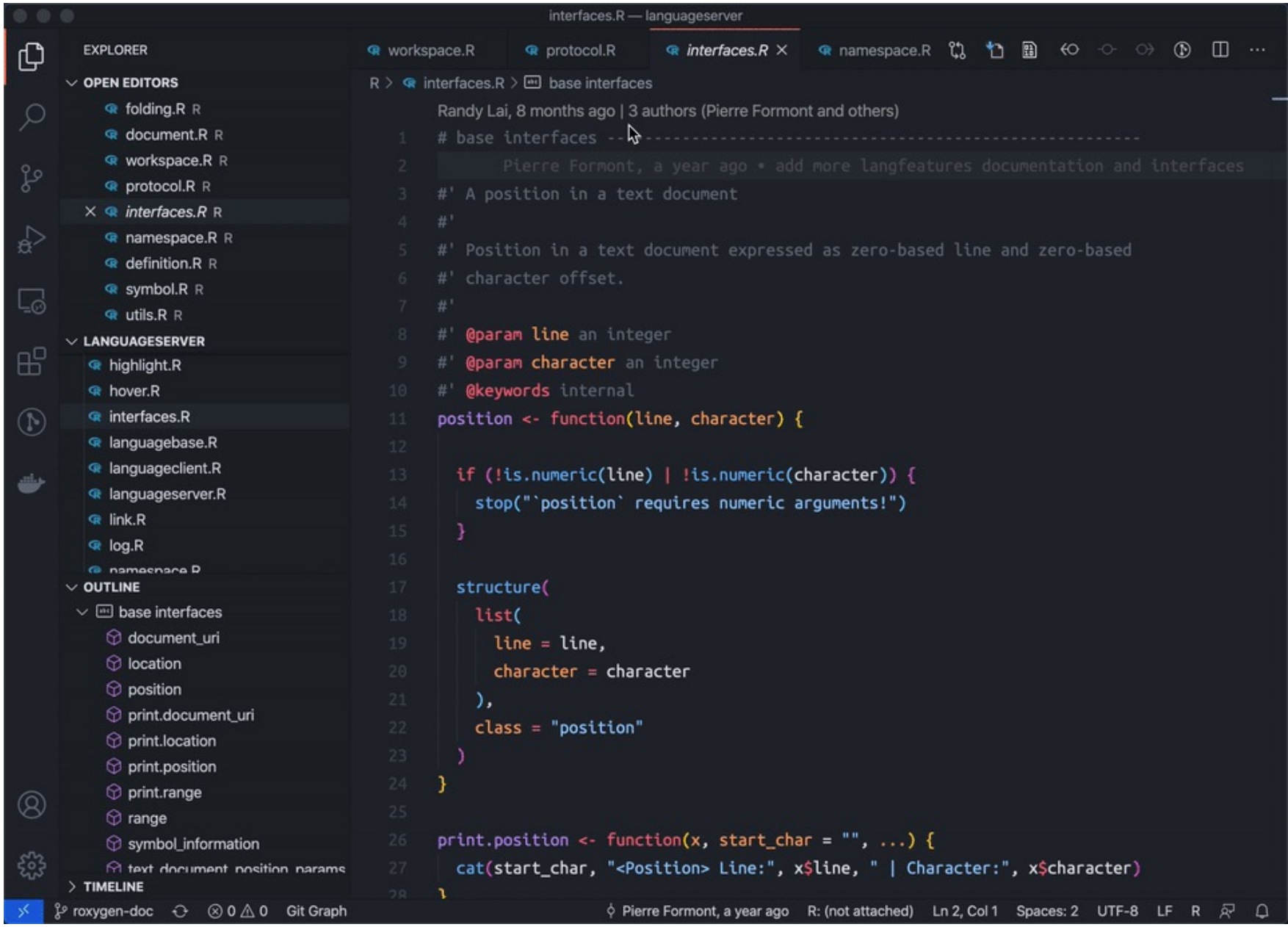
Color

- Inline color preview
- Color picker



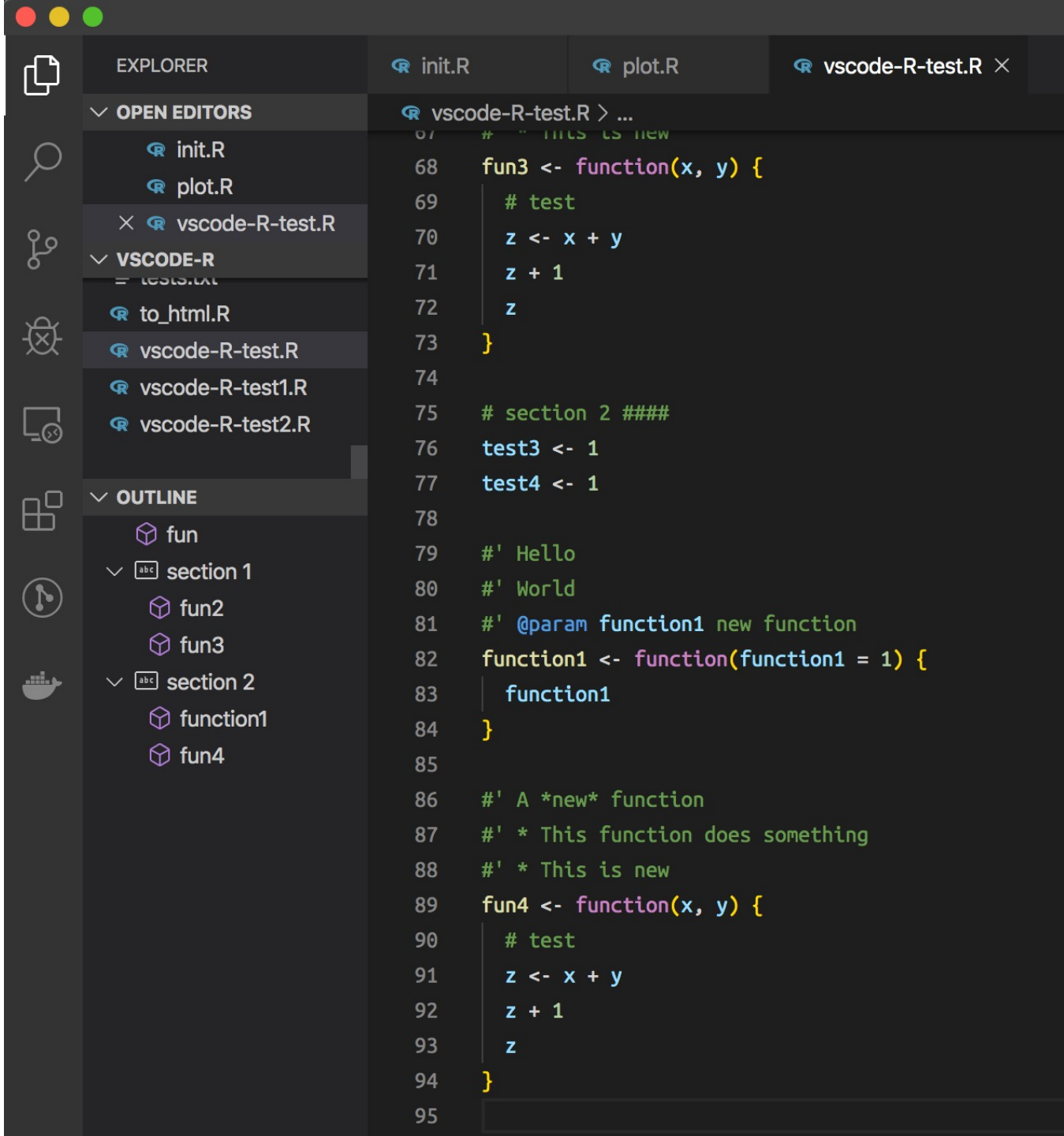
Symbol navigation

- Document symbols
- Workspace symbols



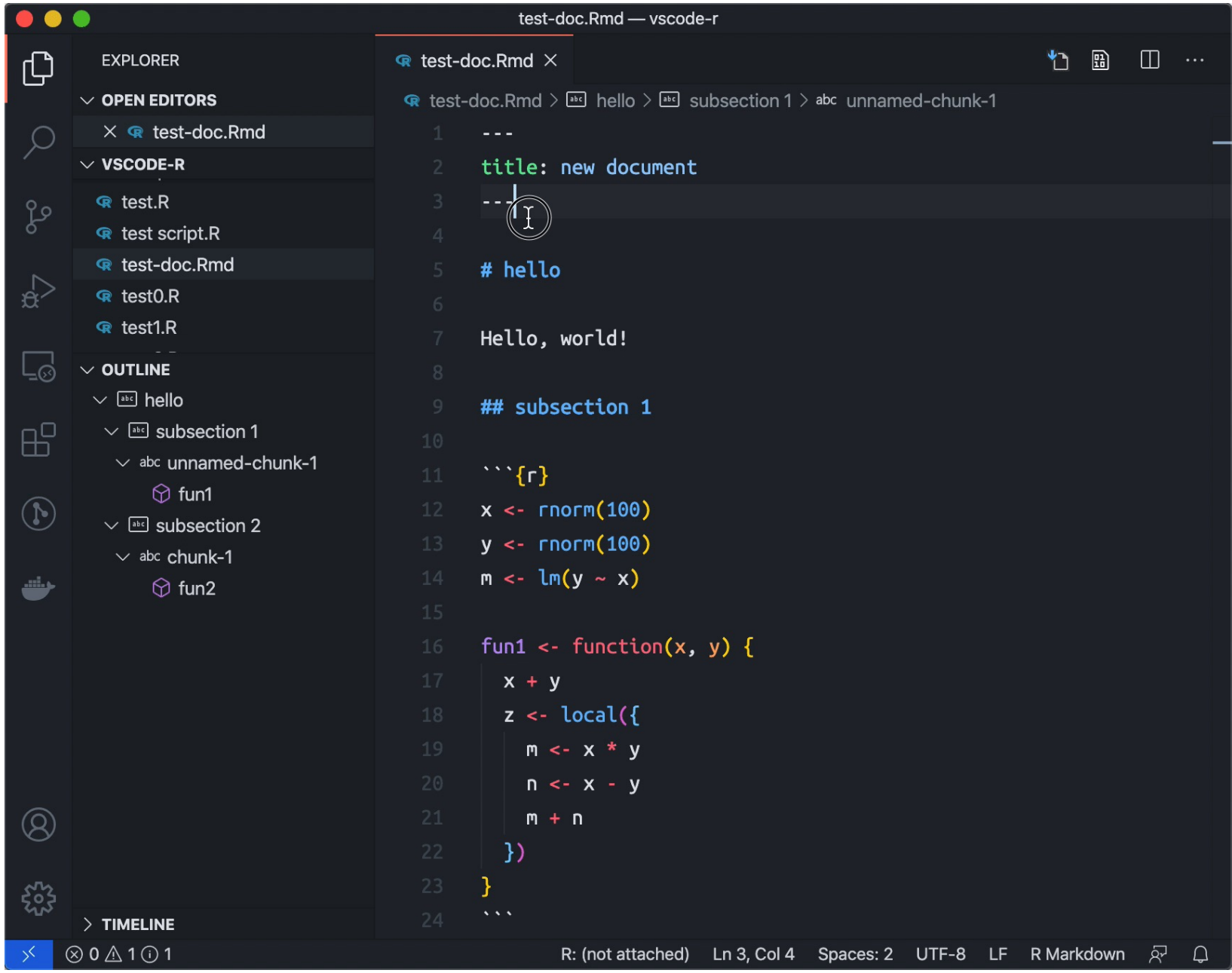
Code sections

- R code sections
- R Markdown code sections



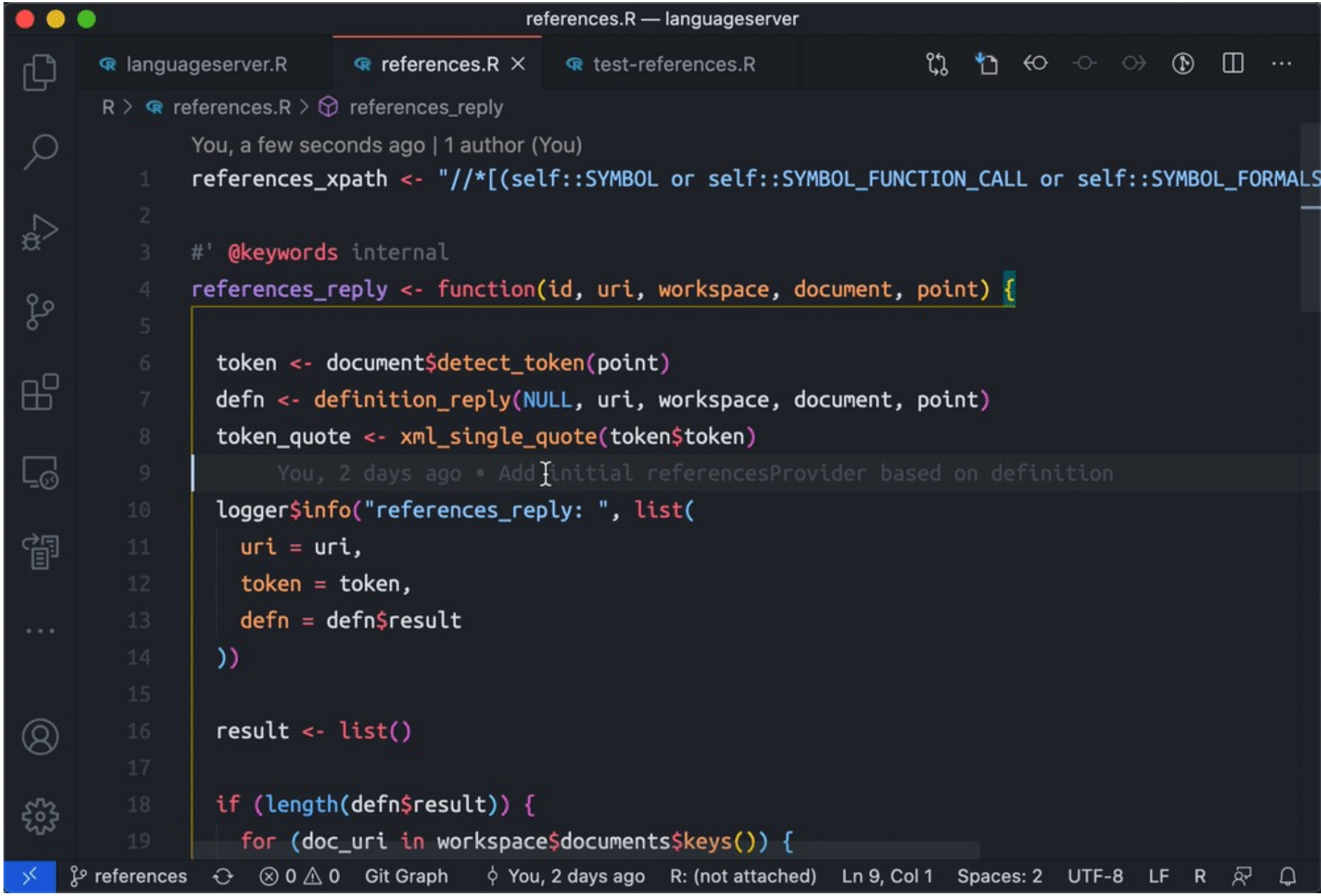
Folding ranges

- R folding ranges
- R Markdown folding ranges



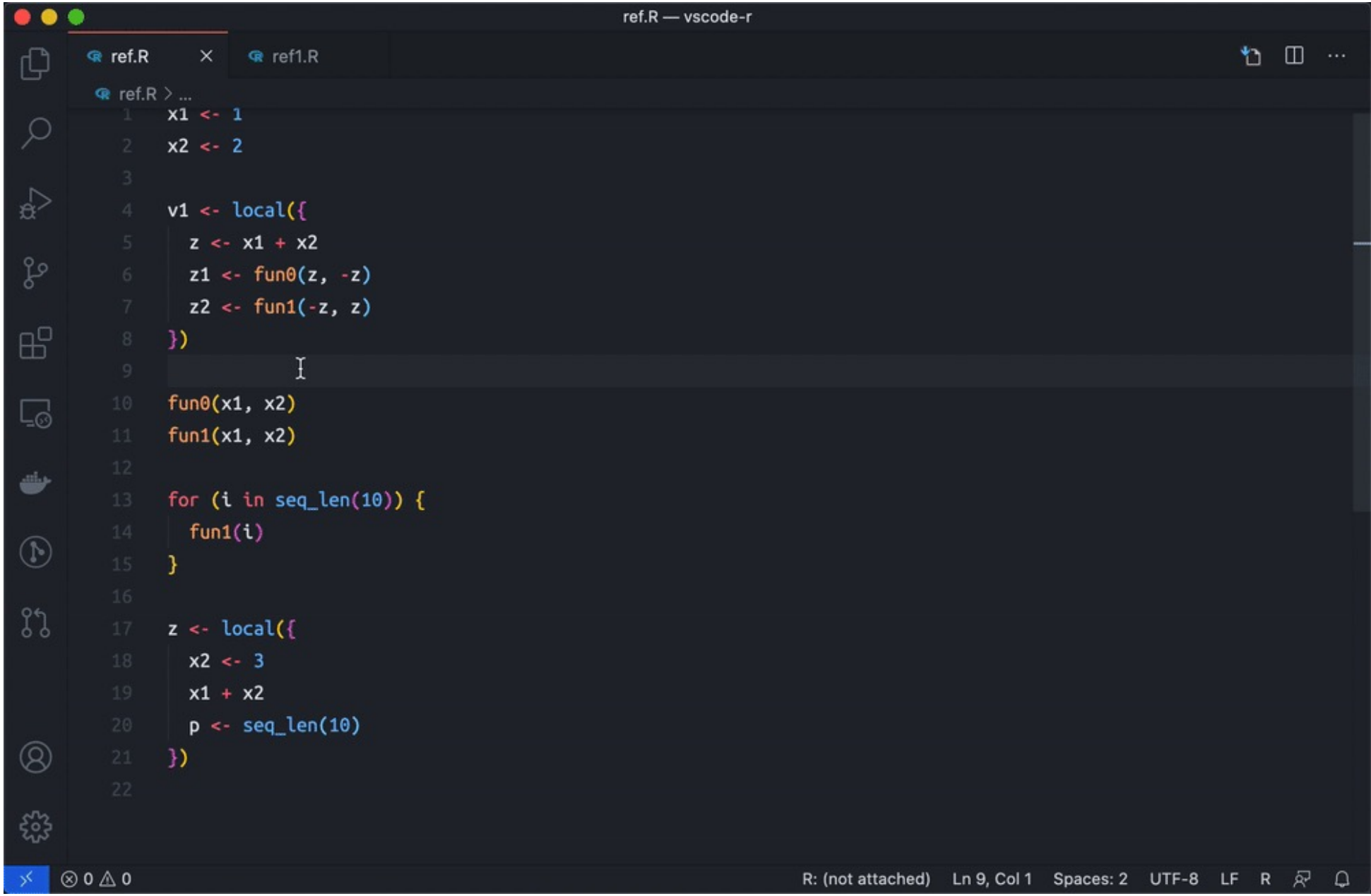
Find references

- Based on definition
- Project-wide searching
- Search all symbols that go to same definition



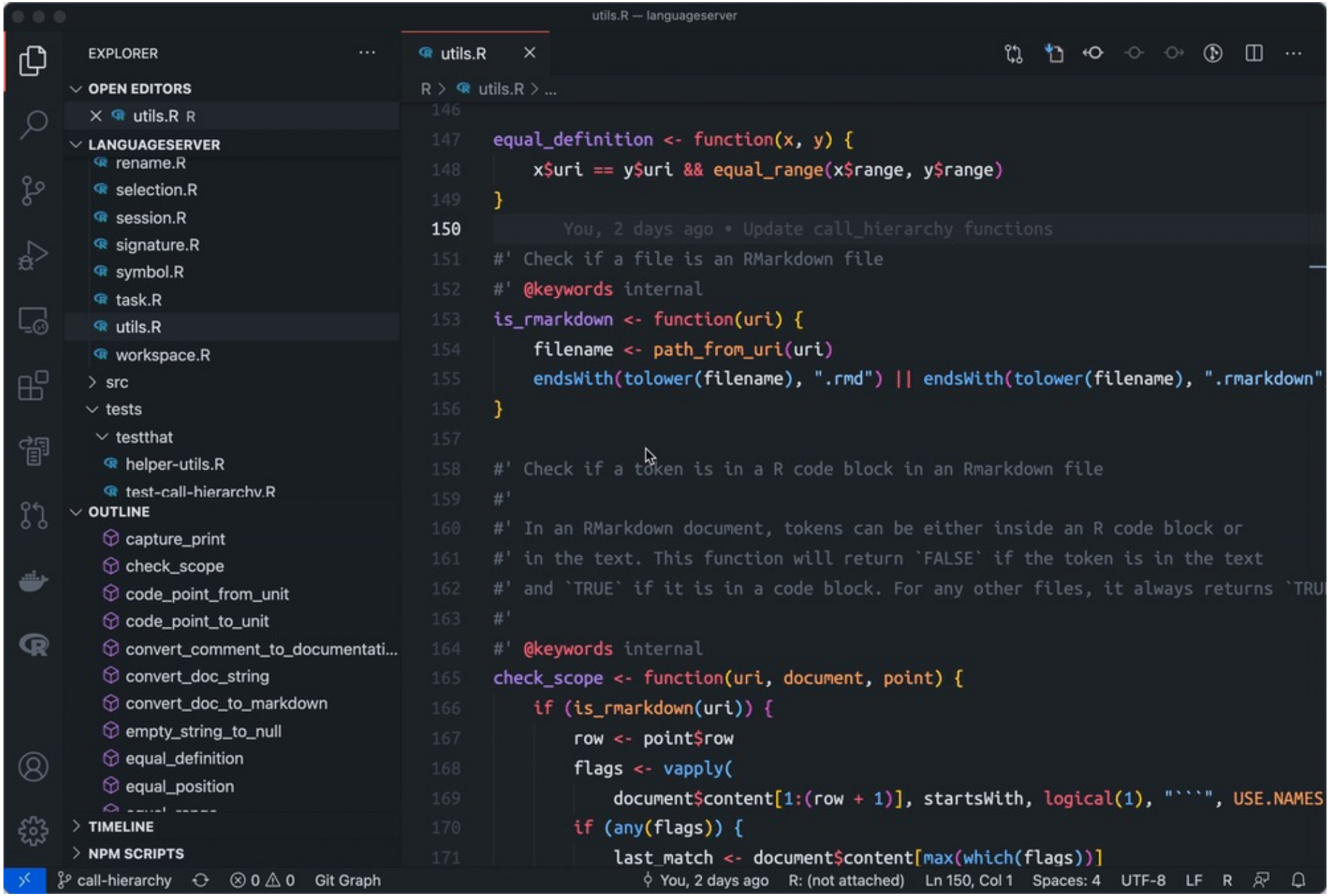
Rename symbol

- Based on references
- Project-wide rename



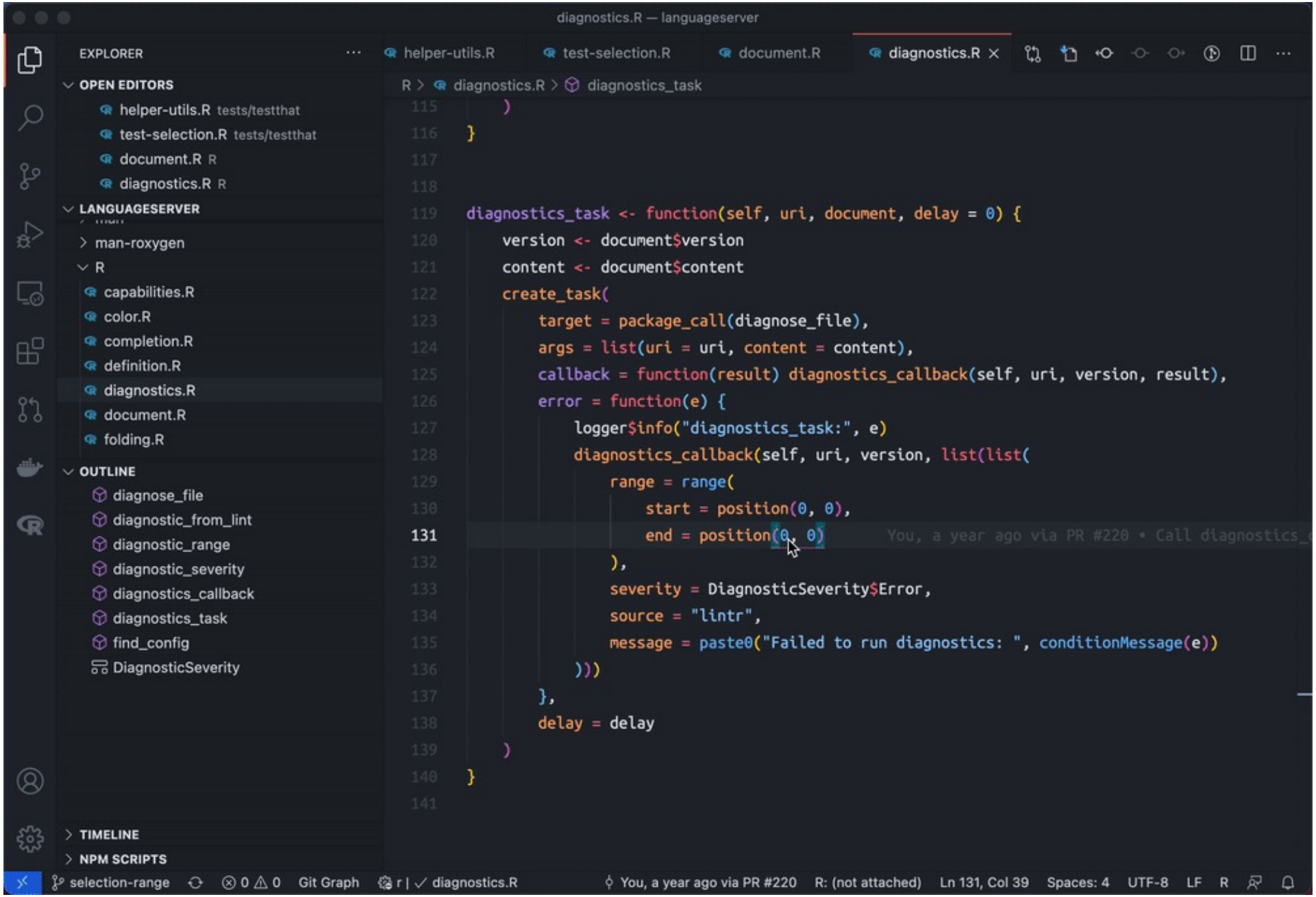
Call Hierarchy

- Based on references
- Project-wide hierarchy
- Incoming calls
- Outgoing calls

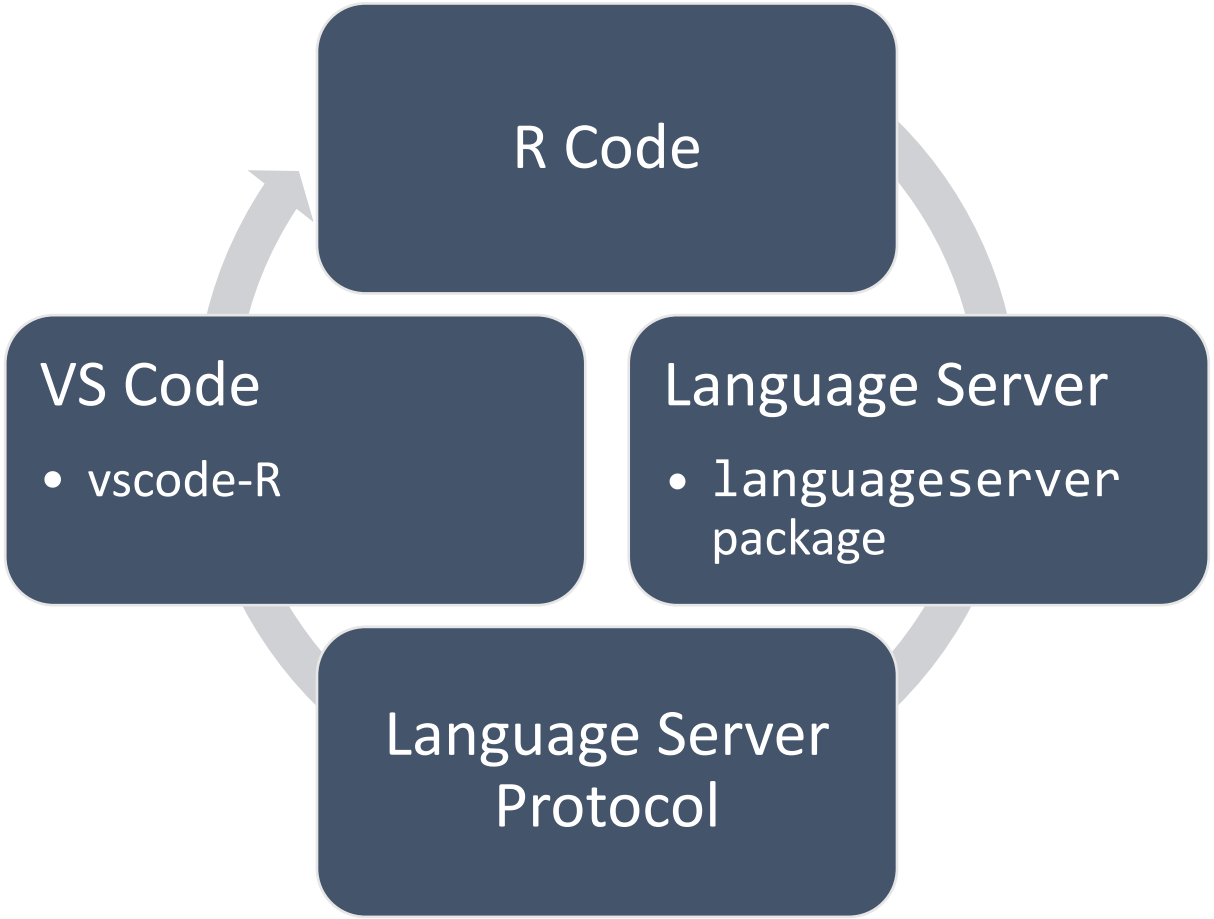


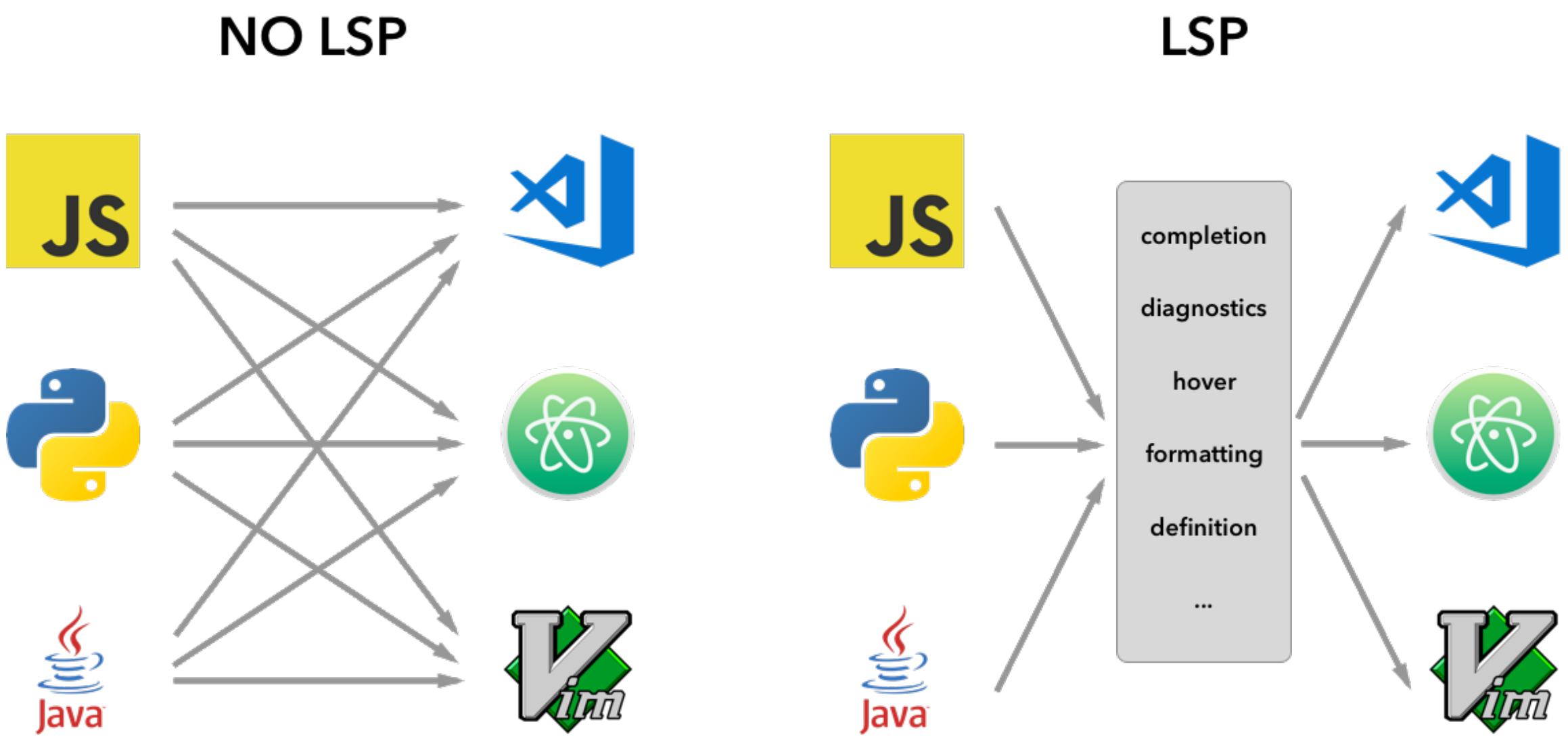
Selection range

- Based on parsed expression ranges



Behind the scene




NO LSP
JS
Java
LSP
JS
Java
completion
diagnostics
hover
formatting
definition
...

Language Server Protocol

R Language Server: the backend

textDocumentSync	hover	completion	signatureHelp	definition
Document Highlight	Document Symbol	Workspace Symbol	Document Formatting	Document RangeFormatting
Document OnTypeFormatting	Document Link	reference	rename	codeAction

Static code analysis based on Abstract-Syntax Tree (AST)

```
c <- fun(a, 1+b)
```

- (function) <-
  - (symbol) c
  - (expr)
    - (function) fun
      - (symbol) a
      - (expr)
        - (function) +
          - (numeric) 1
          - (symbol) b

Why static/lexical analysis

- No need to execute user code
- Works in the background
- Works in parallel
- Still works if user interactive R session
  - Is not started
  - Is busy
  - Has crashed

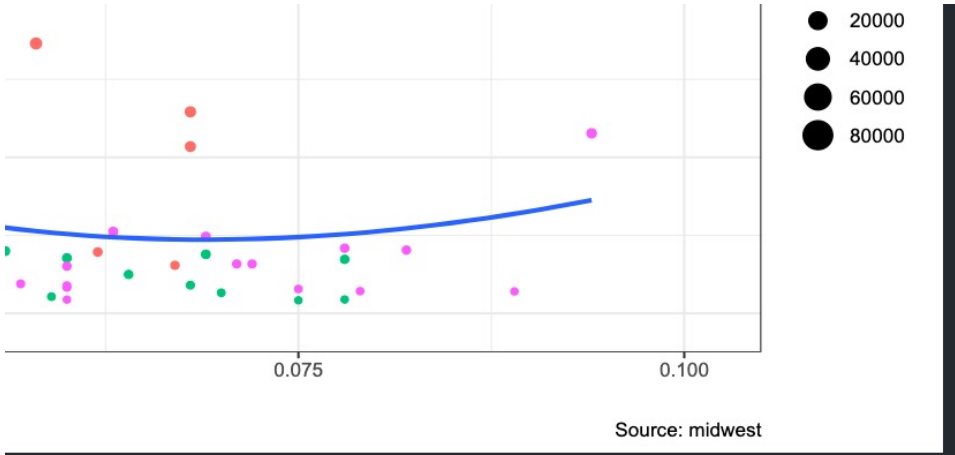
vscode-R extension: the frontend

- Communicate with R language server
- Provide useful commands
- Manage R sessions
- Send code to active terminal
- R Session Watcher
- R Help Viewer
- R Markdown support

vscode-R Session Watcher

- File-based vs. socket-based communication
- Session symbol hover
- Workspace viewer
- Data viewer: data frame, matrix, list
- Plot viewer: base graphics, ggplot2, lattice, etc.
- Browser: shiny apps, R Markdown server
- WebView: htmlwidgets, profvis, etc.
- RStudio addin support

Attach to active session

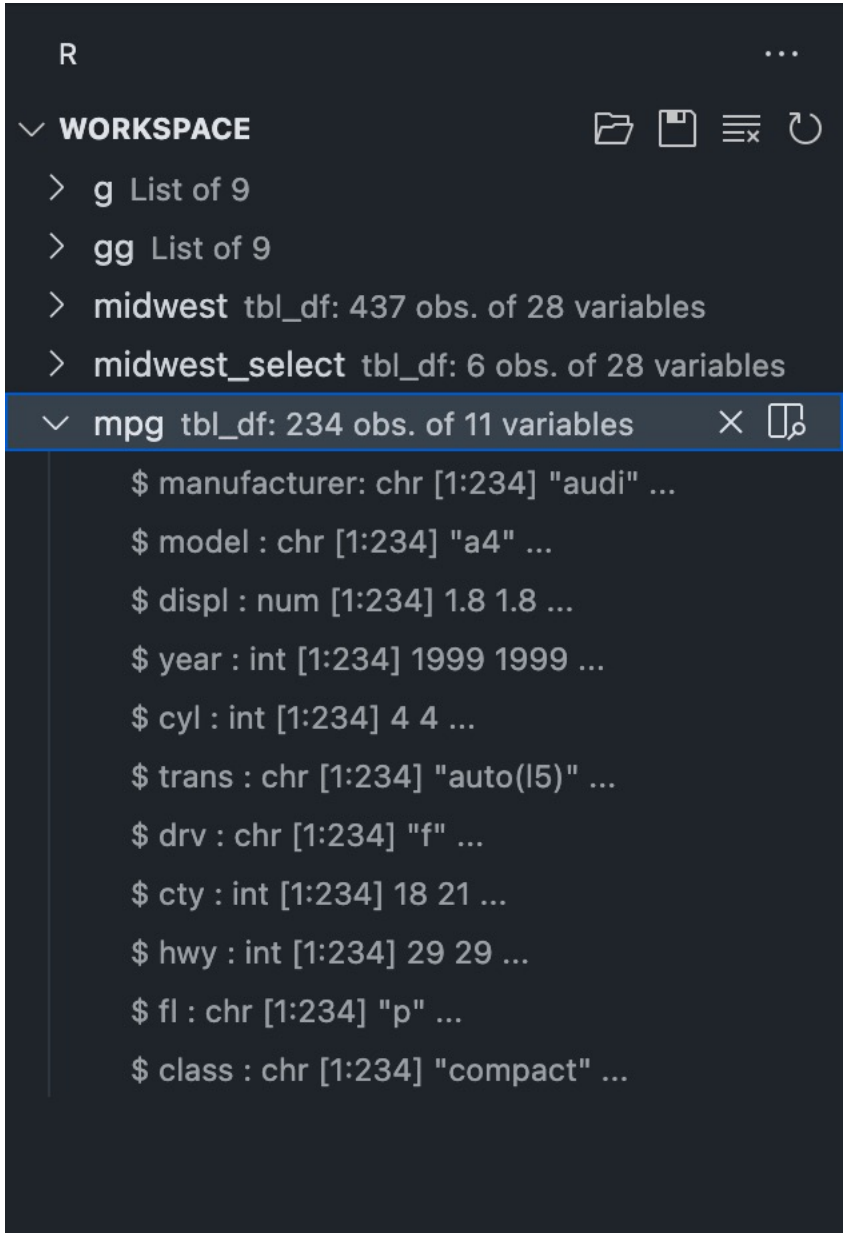



```
Warning messages:
1: Removed 15 rows containing non-finite values (stat_smooth).
2: Removed 15 rows containing missing values (geom_point).

> # load package and data
  library(ggplot2)


> data(mpg, package = "ggplot2") # alternate source: "http://goo.gl/uEeRGu")


> theme_set(theme_bw()) # pre-set the bw theme.


> g <- ggplot(mpg, aes(cty, hwy))


> # Scatterplot
  g + geom_point() +
    geom_smooth(method = "lm", se = F) +
    labs(subtitle = "mpg: city vs highway mileage",
      y = "hwy",
      x = "cty",
      title = "Scatterplot with overlapping points",
      caption = "Source: midwest")

`geom_smooth()` using formula 'y ~ x'

>
```

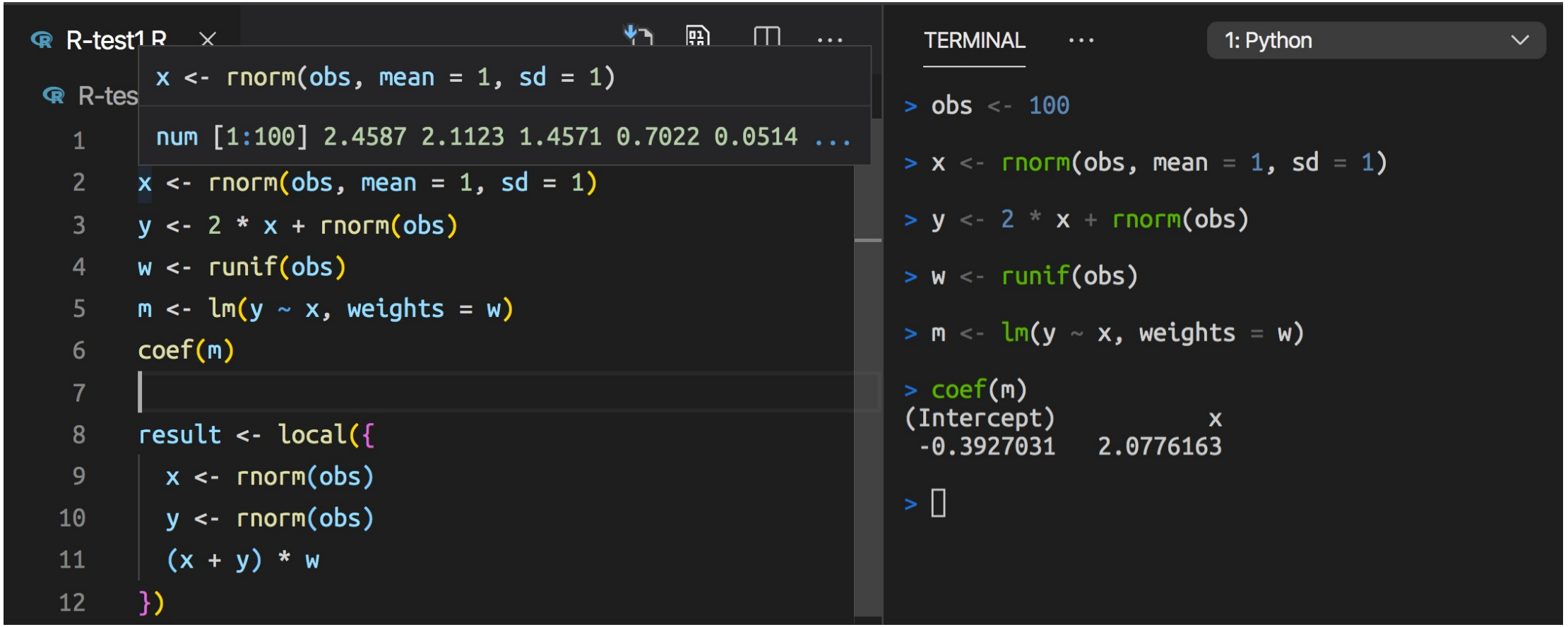
R: 76532 Ln 8, Col 1 Spaces: 2 UTF-8 LF R

Workspace viewer

- Global symbols
- Attached session



Hover: Symbol value in active session



Data viewer

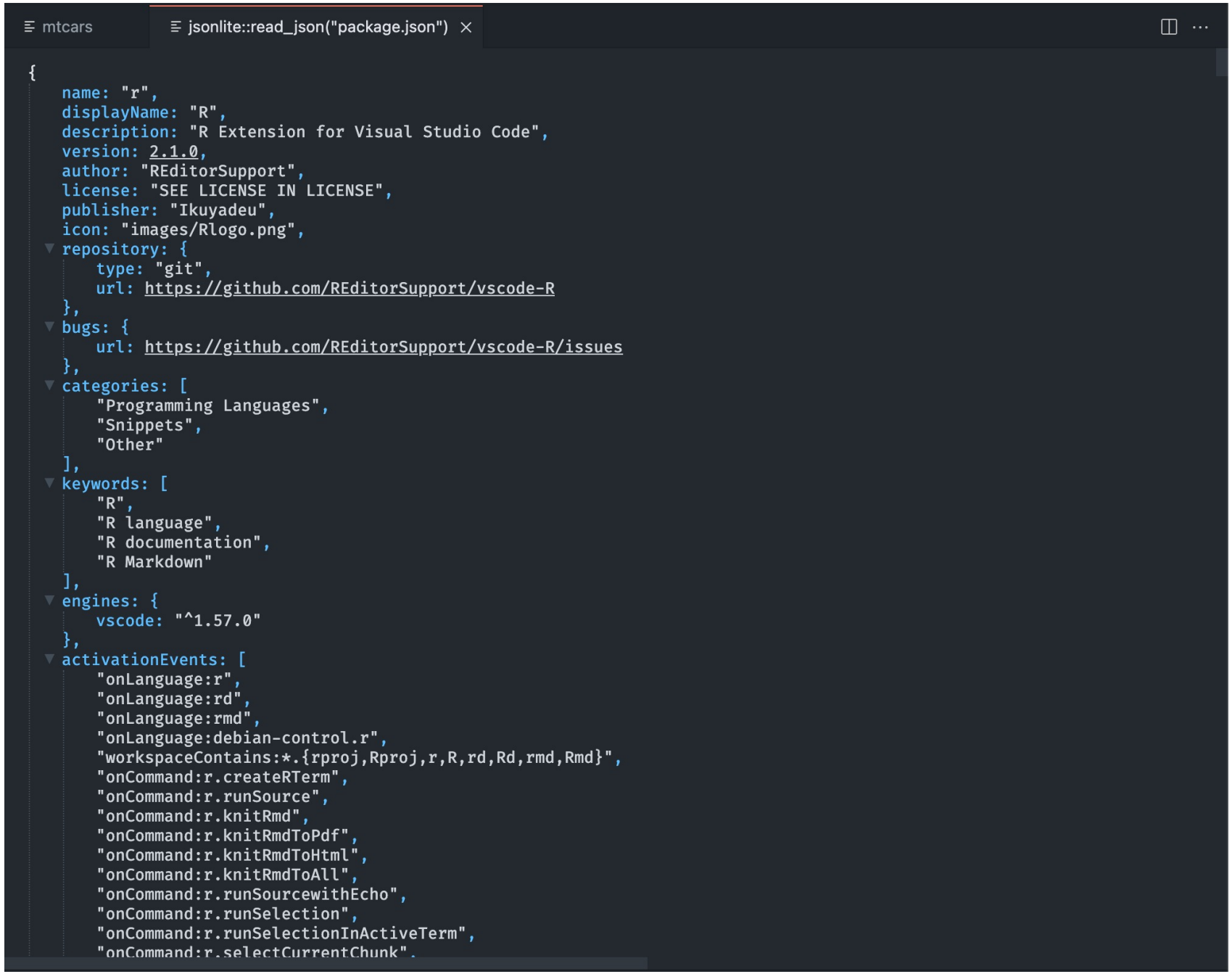
- `View()`

mtcars

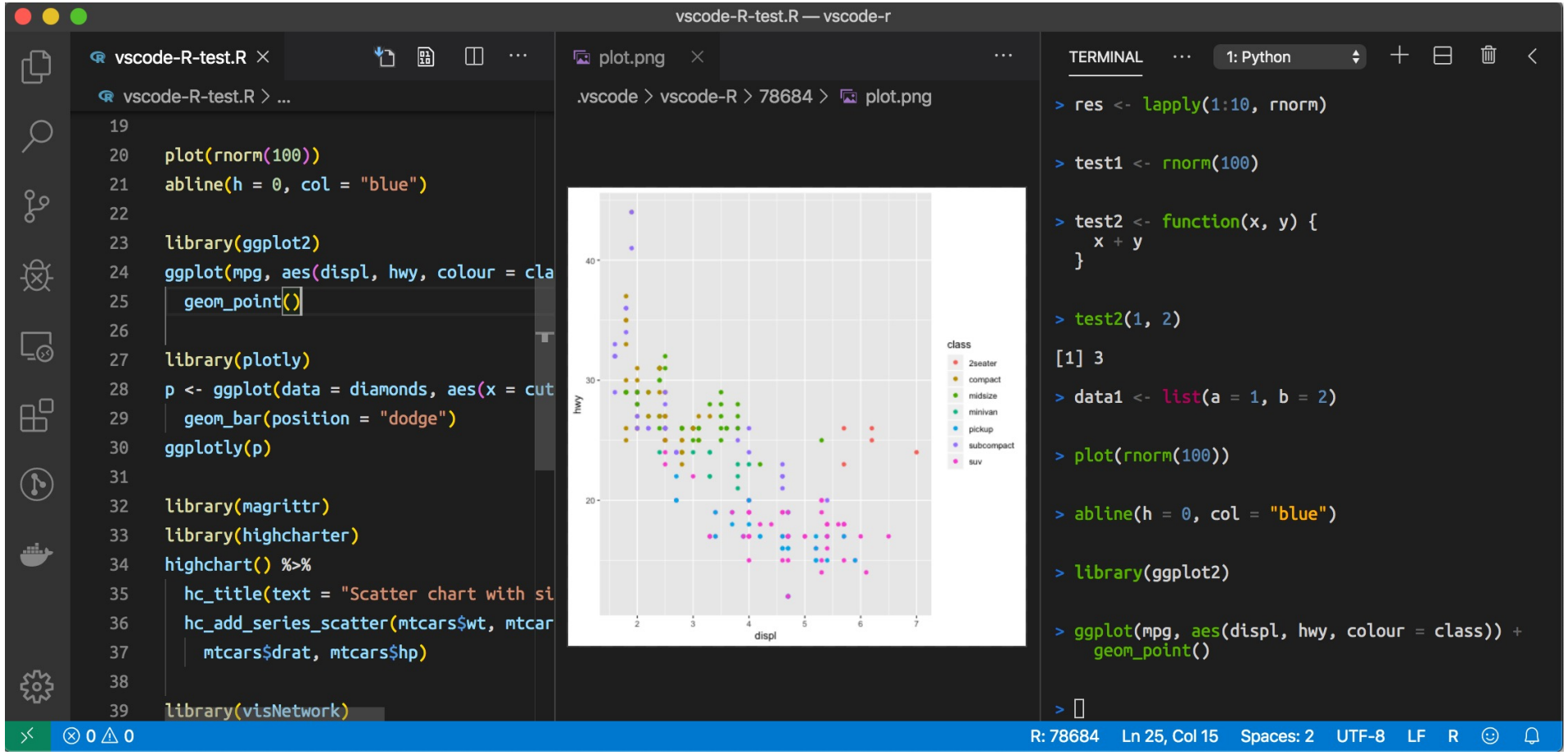
(row)	mpg	cyl	disp	hp	drat	wt	qsec	vs	am	gear	carb
Mazda RX4	21	6	160	110	3.9	2.62	16.46	0	1	4	
Mazda RX4 Wag	21	6	160	110	3.9	2.875	17.02	0	1	4	
Datsun 710	22.8	4	108	93	3.85	2.32	18.61	1	1	4	
Hornet 4 Drive	21.4	6	258	110	3.08	3.215	19.44	1	0	3	
Hornet Sportabout	18.7	8	360	175	3.15	3.44	17.02	0	0	3	
Valiant	18.1	6	225	105	2.76	3.46	20.22	1	0	3	
Duster 360	14.3	8	360	245	3.21	3.57	15.84	0	0	3	
Merc 240D	24.4	4	146.7	62	3.69	3.19	20	1	0	4	
Merc 230	22.8	4	140.8	95	3.92	3.15	22.9	1	0	4	
Merc 280	19.2	6	167.6	123	3.92	3.44	18.3	1	0	4	
Merc 280C	17.8	6	167.6	123	3.92	3.44	18.9	1	0	4	
Merc 450SE	16.4	8	275.8	180	3.07	4.07	17.4	0	0	3	
Merc 450SL	17.3	8	275.8	180	3.07	3.73	17.6	0	0	3	
Merc 450SLC	15.2	8	275.8	180	3.07	3.78	18	0	0	3	
Cadillac Fleetwood	10.4	8	472	205	2.93	5.25	17.98	0	0	3	
Lincoln Continental	10.4	8	460	215	3	5.424	17.82	0	0	3	
Chrysler Imperial	14.7	8	440	230	3.23	5.345	17.42	0	0	3	
Fiat 128	32.4	4	78.7	66	4.08	2.2	19.47	1	1	4	
Honda Civic	30.4	4	75.7	52	4.93	1.615	18.52	1	1	4	
Toyota Corolla	33.9	4	71.1	65	4.22	1.835	19.9	1	1	4	
Toyota Corona	21.5	4	120.1	97	3.7	2.465	20.01	1	0	3	
Dodge Challenger	15.5	8	318	150	2.76	3.52	16.87	0	0	3	
AMC Javelin	15.2	8	304	150	3.15	3.435	17.3	0	0	3	
Camaro Z28	13.3	8	350	245	3.73	3.84	15.41	0	0	3	
Pontiac Firebird	19.2	8	400	175	3.08	3.845	17.05	0	0	3	
Fiat X1-9	27.3	4	79	66	4.08	1.935	18.9	1	1	4	
Porsche 914-2	26	4	120.3	91	4.43	2.14	16.7	0	1	5	

1 to 32 of 32 Page 1 of 1

List viewer

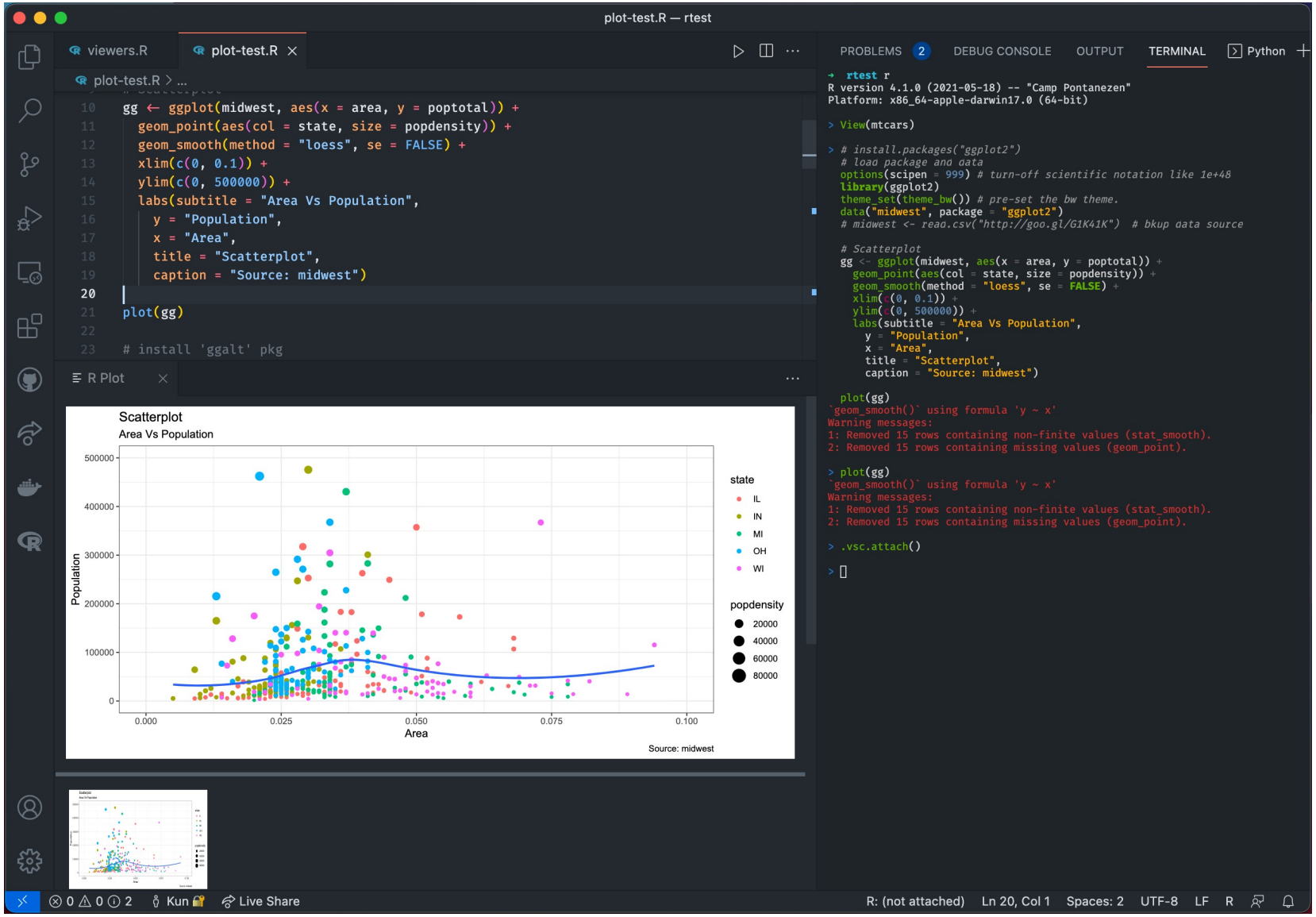

mtcars
jsonlite::read_json("package.json")
{
name: "r",
displayName: "R",
description: "R Extension for Visual Studio Code",
version: 2.1.0,
author: "REditorSupport",
license: "SEE LICENSE IN LICENSE",
publisher: "Ikuyadeu",
icon: "images/Rlogo.png",
repository: {
type: "git",
url: https://github.com/REditorSupport/vscode-R
},
bugs: {
url: https://github.com/REditorSupport/vscode-R/issues
},
categories: [
"Programming Languages",
"Snippets",
"Other"
],
keywords: [
"R",
"R language",
"R documentation",
"R Markdown"
],
engines: {
vscode: "^1.57.0"
},
activationEvents: [
"onLanguage:r",
"onLanguage:rd",
"onLanguage:rmd",
"onLanguage:debian-control.r",
"workspaceContains:*.{rproj,Rproj,r,R,rd,Rd,rmd,Rmd}",
"onCommand:r.createRTerm",
"onCommand:r.runSource",
"onCommand:r.knitRmd",
"onCommand:r.knitRmdToPdf",
"onCommand:r.knitRmdToHtml",
"onCommand:r.knitRmdToAll",
"onCommand:r.runSourcewithEcho",
"onCommand:r.runSelection",
"onCommand:r.runSelectionInActiveTerm",
"onCommand:r.selectCurrentChunk",

Plot viewer: PNG viewer

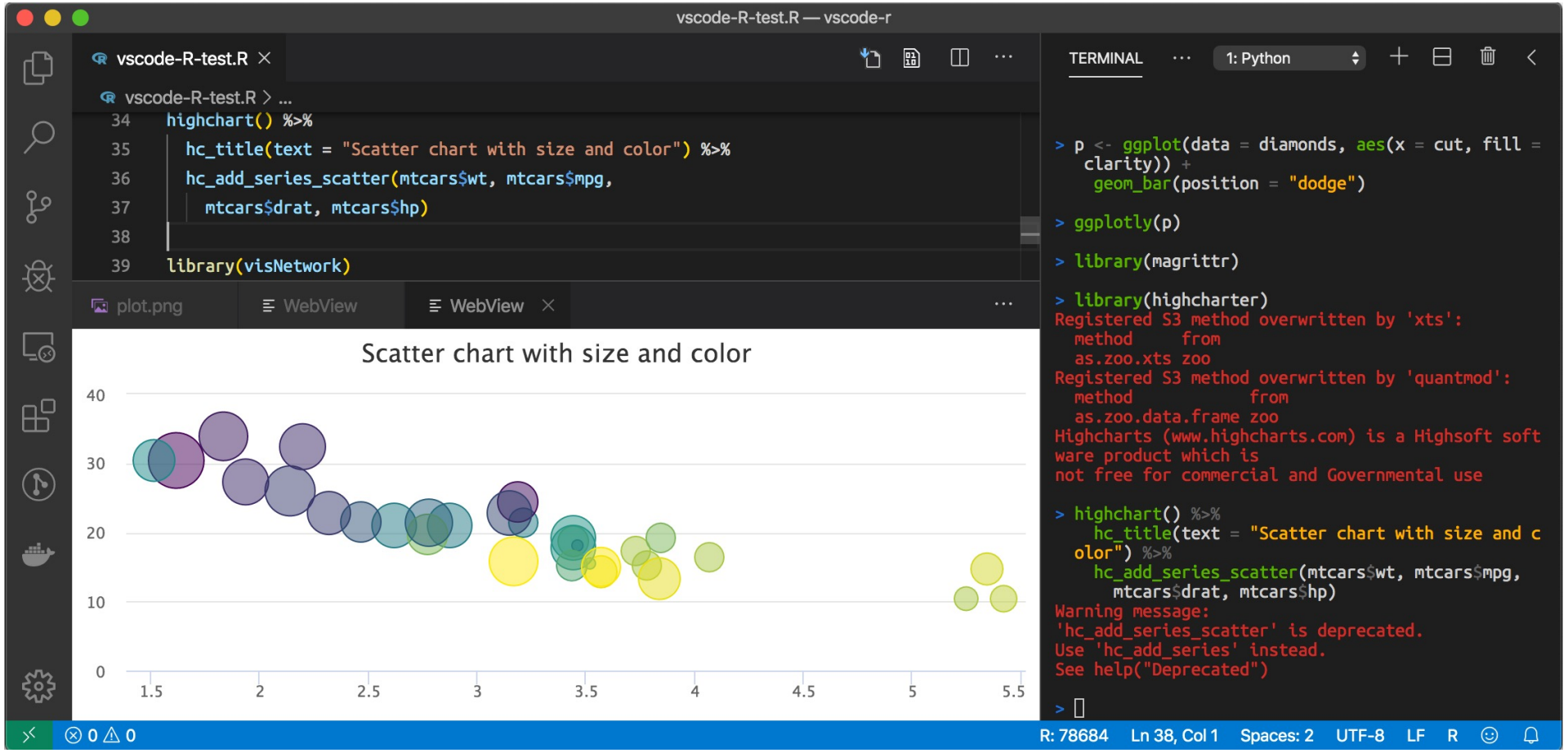


Plot viewer

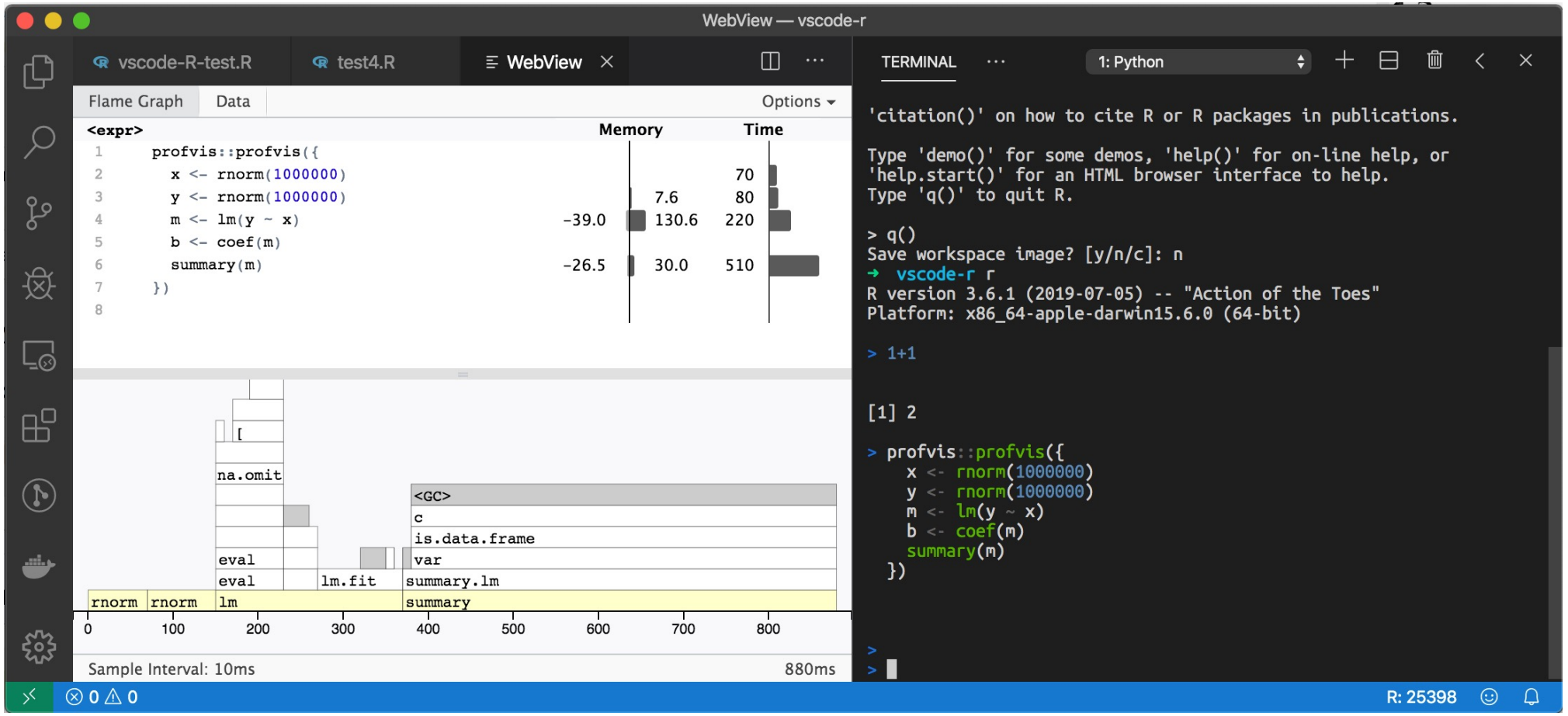
- Based on `httpgd`
- SVG rendering
- Plot history
- Auto resize
- Open in browser
- Save to multiple formats



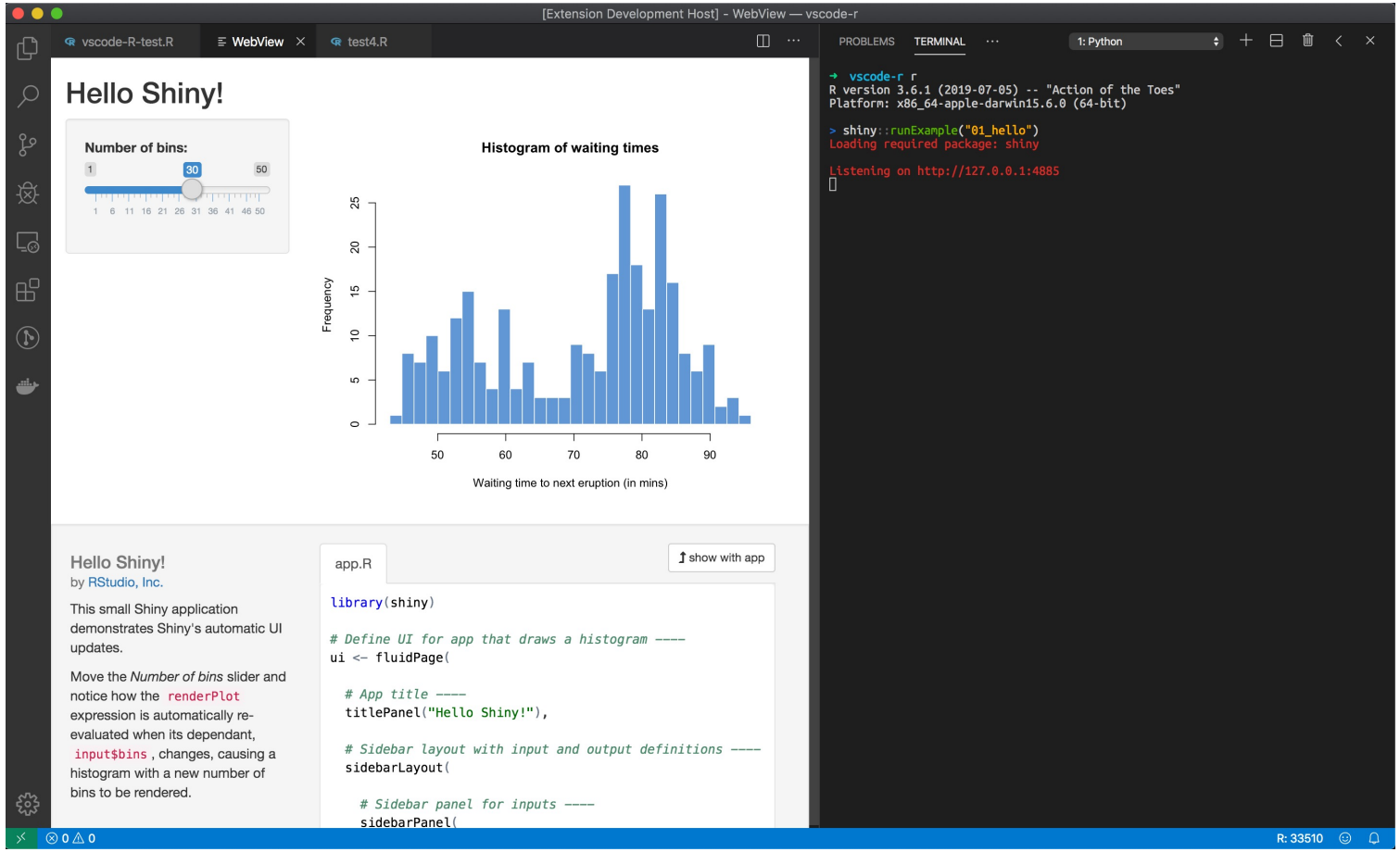
Show htmlwidgets in WebView



Code profiling by `profvis`

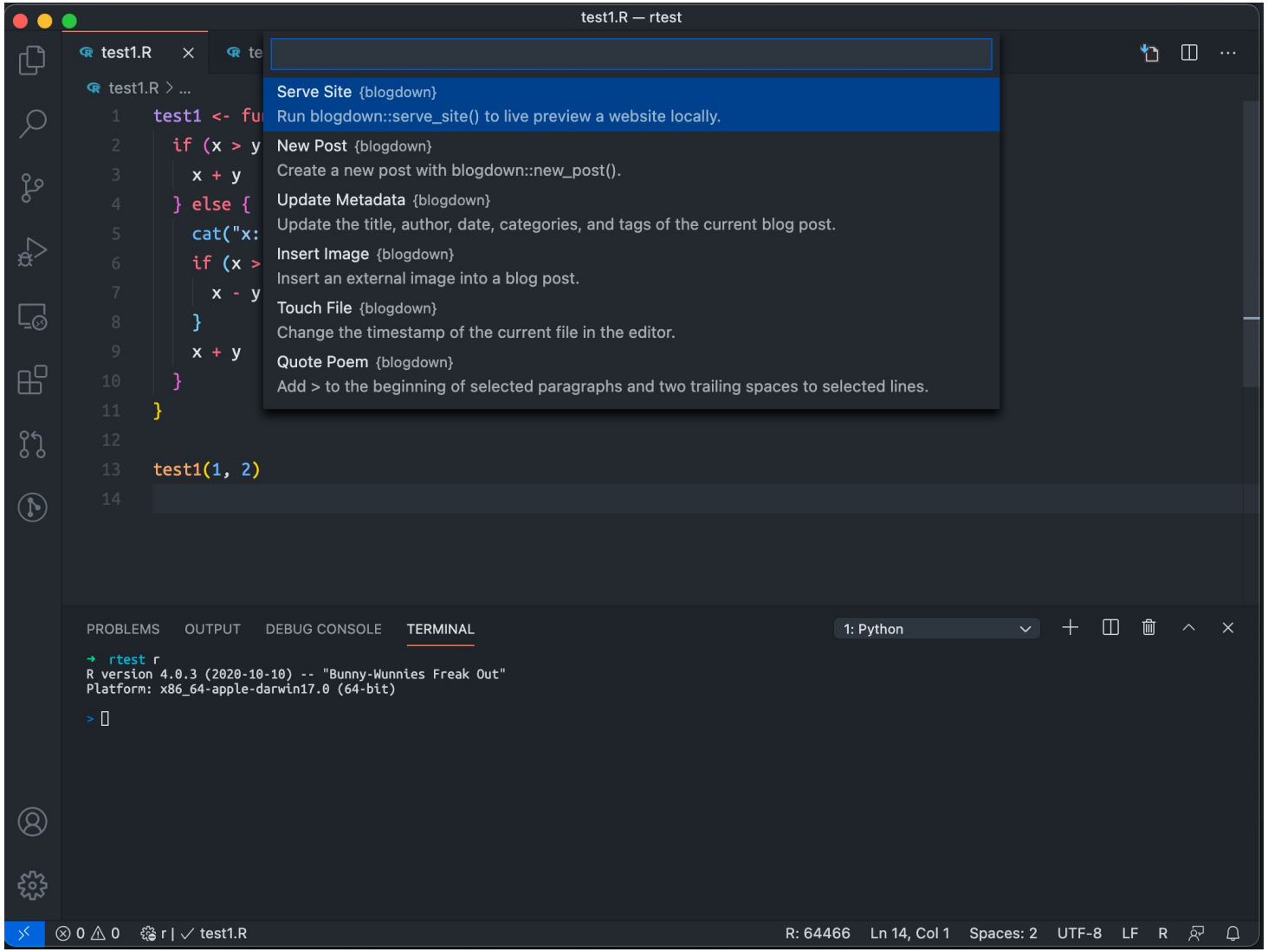


Show Shiny apps

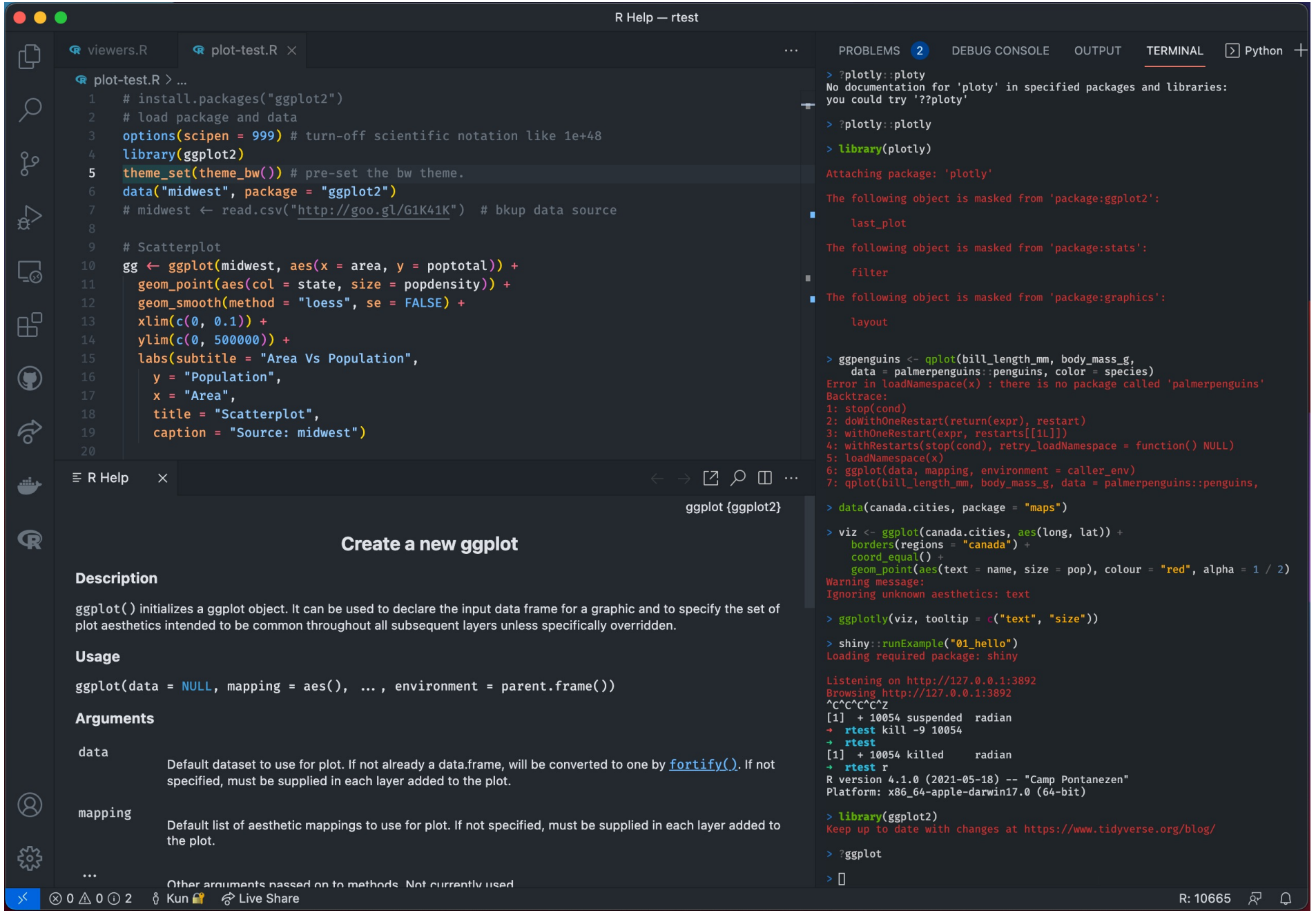


RStudio addin support

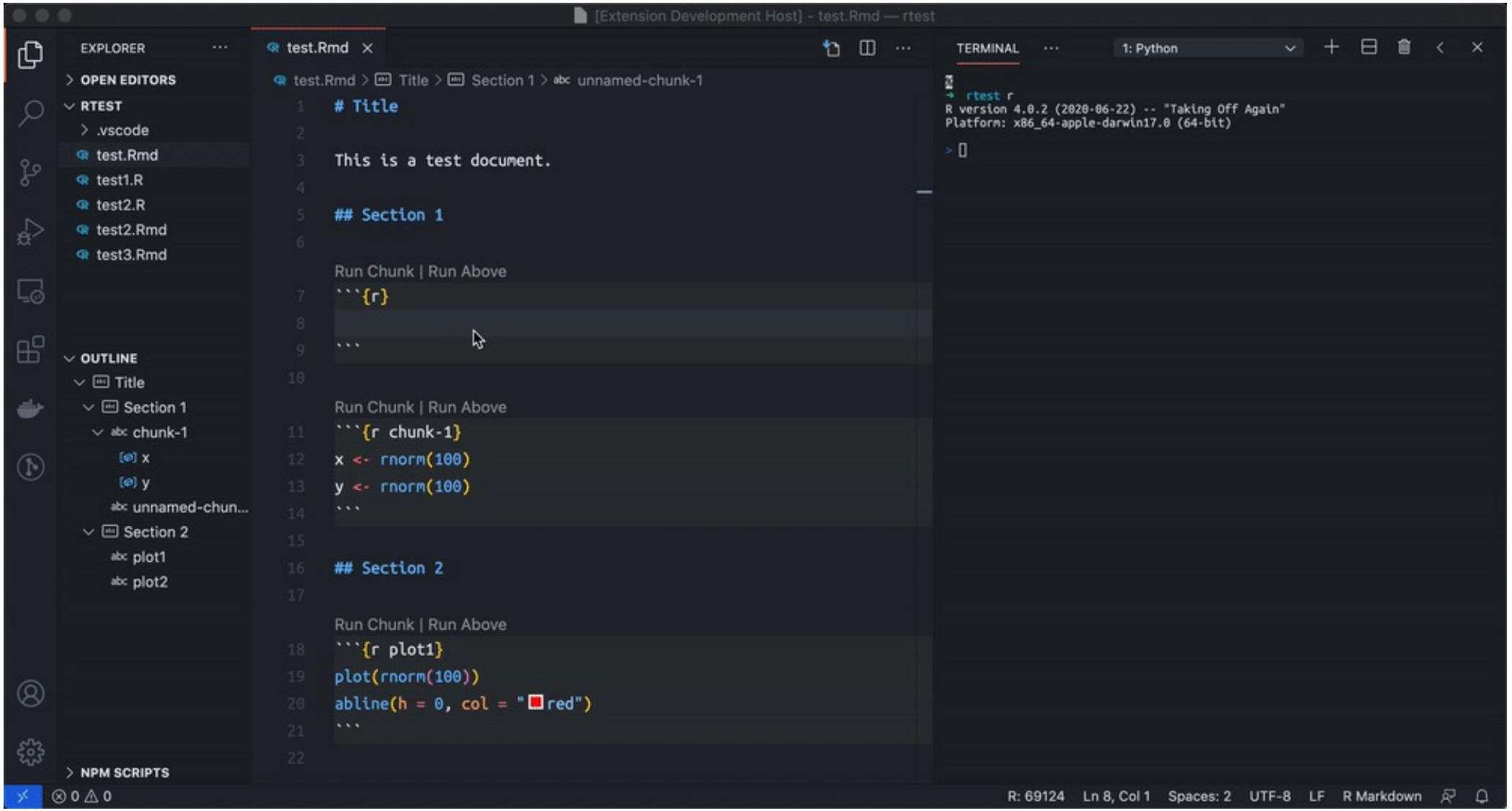
- {rstudioapi} emulation layer
- Support many addins



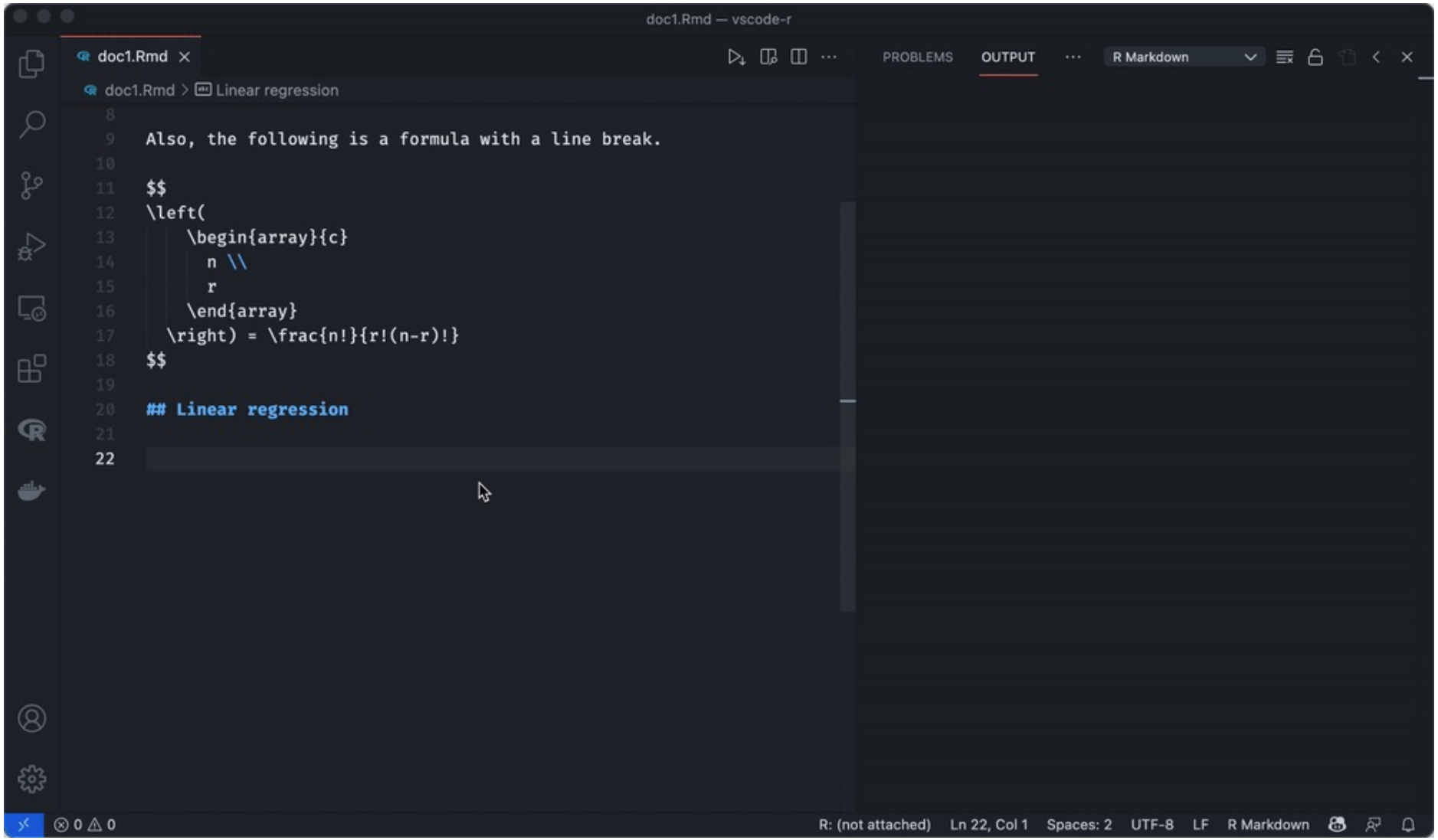
Help viewer


R Help — rtest
viewers.R
plot-test.R
plot-test.R > ...
install.packages("ggplot2")
load package and data
options(scipen = 999) # turn-off scientific notation like 1e+48
library(ggplot2)
theme_set(theme_bw()) # pre-set the bw theme.
data("midwest", package = "ggplot2")
# midwest <- read.csv("http://goo.gl/G1K41K") # bkup data source
# Scatterplot
gg <- ggplot(midwest, aes(x = area, y = poptotal)) +
geom_point(aes(col = state, size = popdensity)) +
geom_smooth(method = "loess", se = FALSE) +
xlim(c(0, 0.1)) +
ylim(c(0, 500000)) +
labs(subtitle = "Area Vs Population",
y = "Population",
x = "Area",
title = "Scatterplot",
caption = "Source: midwest")
R Help
ggplot {ggplot2}
Create a new ggplot
Description
ggplot() initializes a ggplot object. It can be used to declare the input data frame for a graphic and to specify the set of plot aesthetics intended to be common throughout all subsequent layers unless specifically overridden.
Usage
ggplot(data = NULL, mapping = aes(), ... , environment = parent.frame())
Arguments
data
Default dataset to use for plot. If not already a data.frame, will be converted to one by fortify(). If not specified, must be supplied in each layer added to the plot.
mapping
Default list of aesthetic mappings to use for plot. If not specified, must be supplied in each layer added to the plot.
...
Other arguments passed on to methods. Not currently used.
PROBLEMS 2
DEBUG CONSOLE
OUTPUT
TERMINAL
Python
> ?plotly::ploty
No documentation for 'ploty' in specified packages and libraries:
you could try '??ploty'
> ?plotly::plotly
> library(plotly)
Attaching package: 'plotly'
The following object is masked from 'package:ggplot2':
last_plot
The following object is masked from 'package:stats':
filter
The following object is masked from 'package:graphics':
layout
> ggpenguins <- qplot(bill_length_mm, body_mass_g,
data = palmerpenguins::penguins, color = species)
Error in loadNamespace(x) : there is no package called 'palmerpenguins'
Backtrace:
1: stop(cond)
2: doWithOneRestart(return(expr), restart)
3: withOneRestart(expr, restarts[[1L]])
4: withRestarts(stop(cond), retry_loadNamespace = function() NULL)
5: loadNamespace(x)
6: ggplot(data, mapping, environment = caller_env)
7: qplot(bill_length_mm, body_mass_g, data = palmerpenguins::penguins,
> data(canada.cities, package = "maps")
> viz <- ggplot(canada.cities, aes(long, lat)) +
borders(regions = "canada") +
coord_equal() +
geom_point(aes(text = name, size = pop), colour = "red", alpha = 1 / 2)
Warning message:
Ignoring unknown aesthetics: text
> ggplotly(viz, tooltip = c("text", "size"))
> shiny::runExample("01_hello")
Loading required package: shiny
Listening on http://127.0.0.1:3892
Browsing http://127.0.0.1:3892
^C^C^C^C^Z
[1] + 10054 suspended radian
→ rtest kill -9 10054
→ rtest
[1] + 10054 killed   radian
→ rtest r
R version 4.1.0 (2021-05-18) -- "Camp Pontanezen"
Platform: x86_64-apple-darwin17.0 (64-bit)
> library(ggplot2)
Keep up to date with changes at https://www.tidyverse.org/blog/
> ?ggplot
>
⊗ 0 ⚠ 0 ⓘ 2
Kun
Live Share
R: 10665

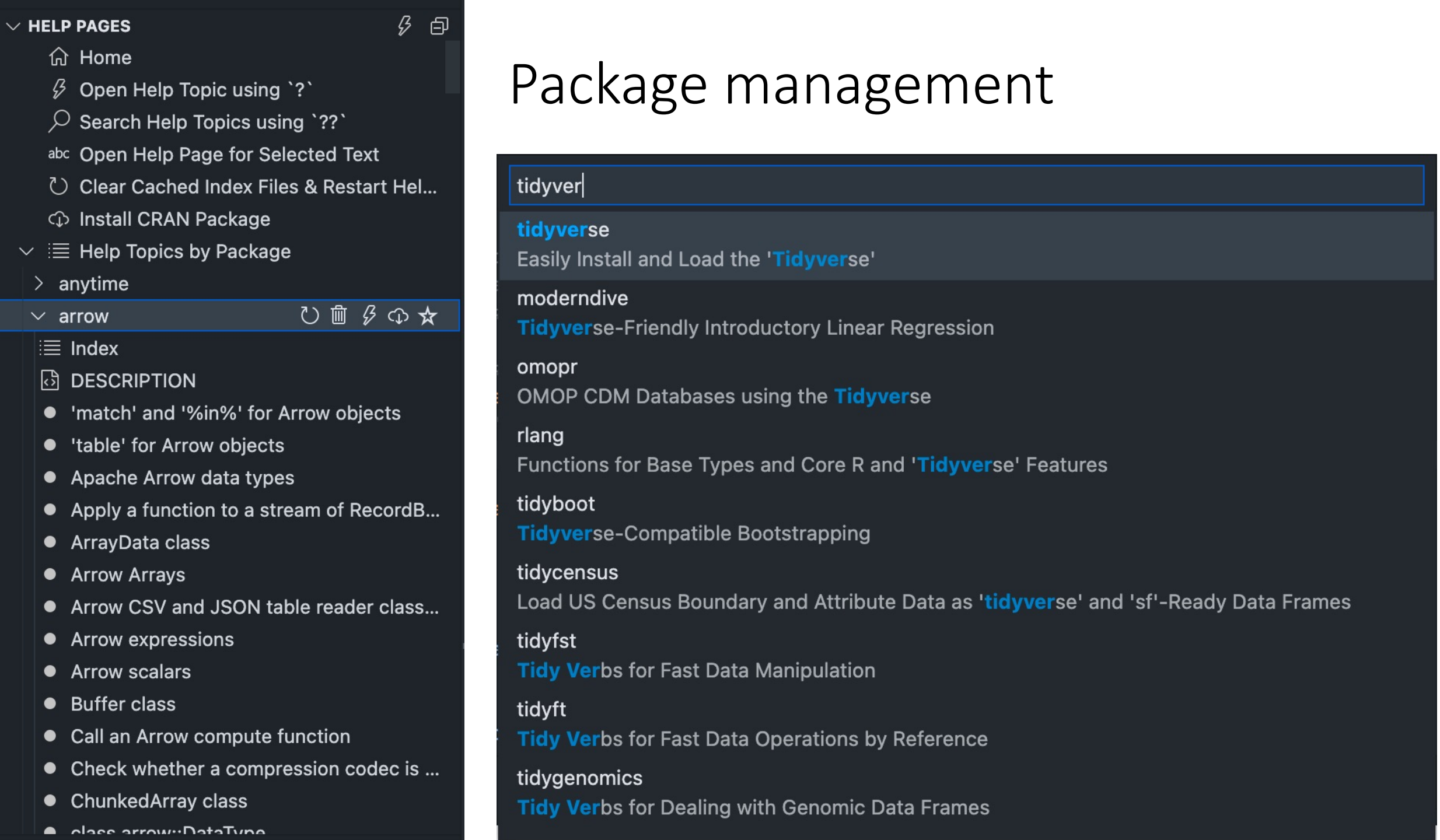
R Markdown: Editing



R Markdown: Live preview

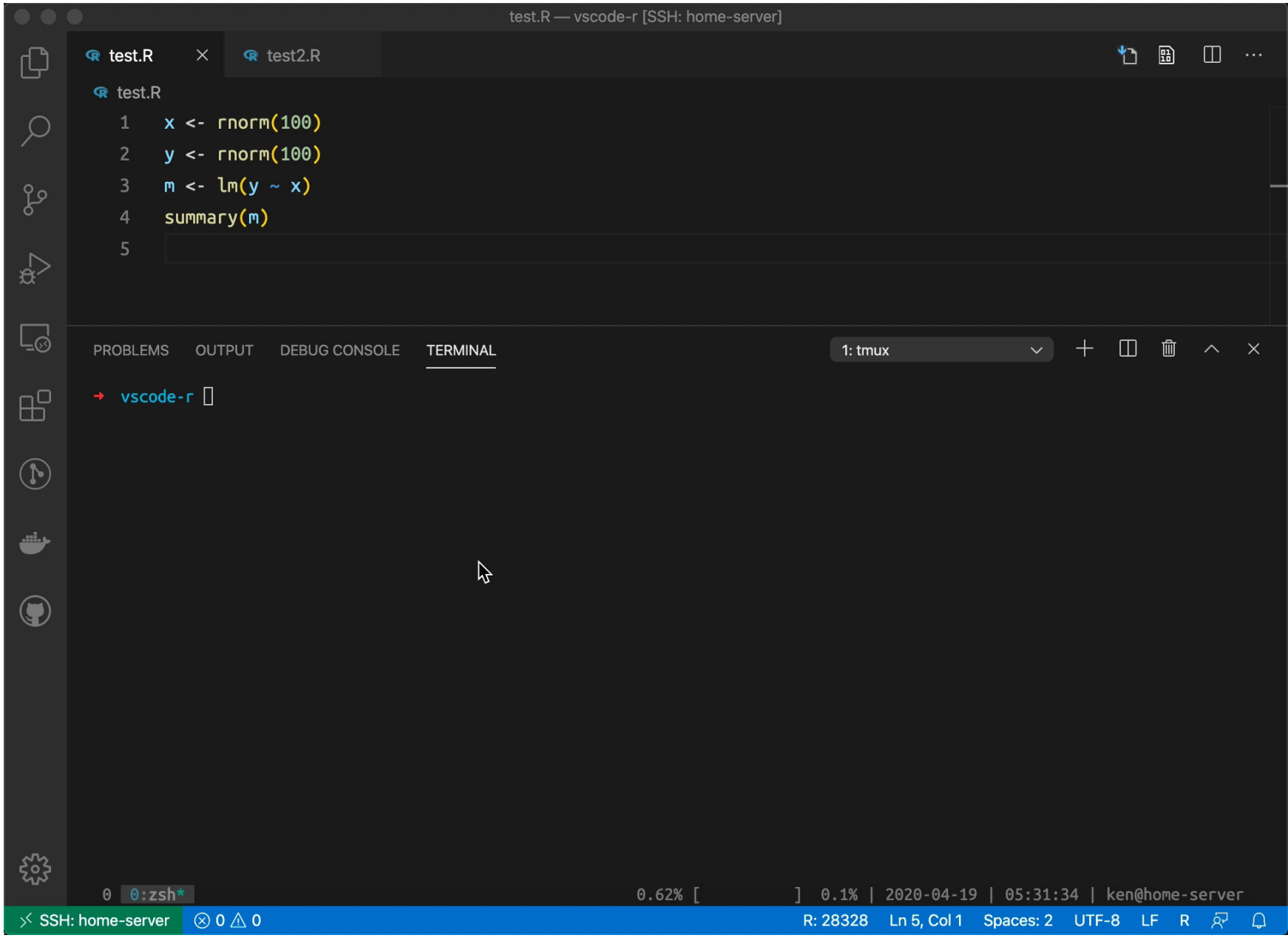


Package management



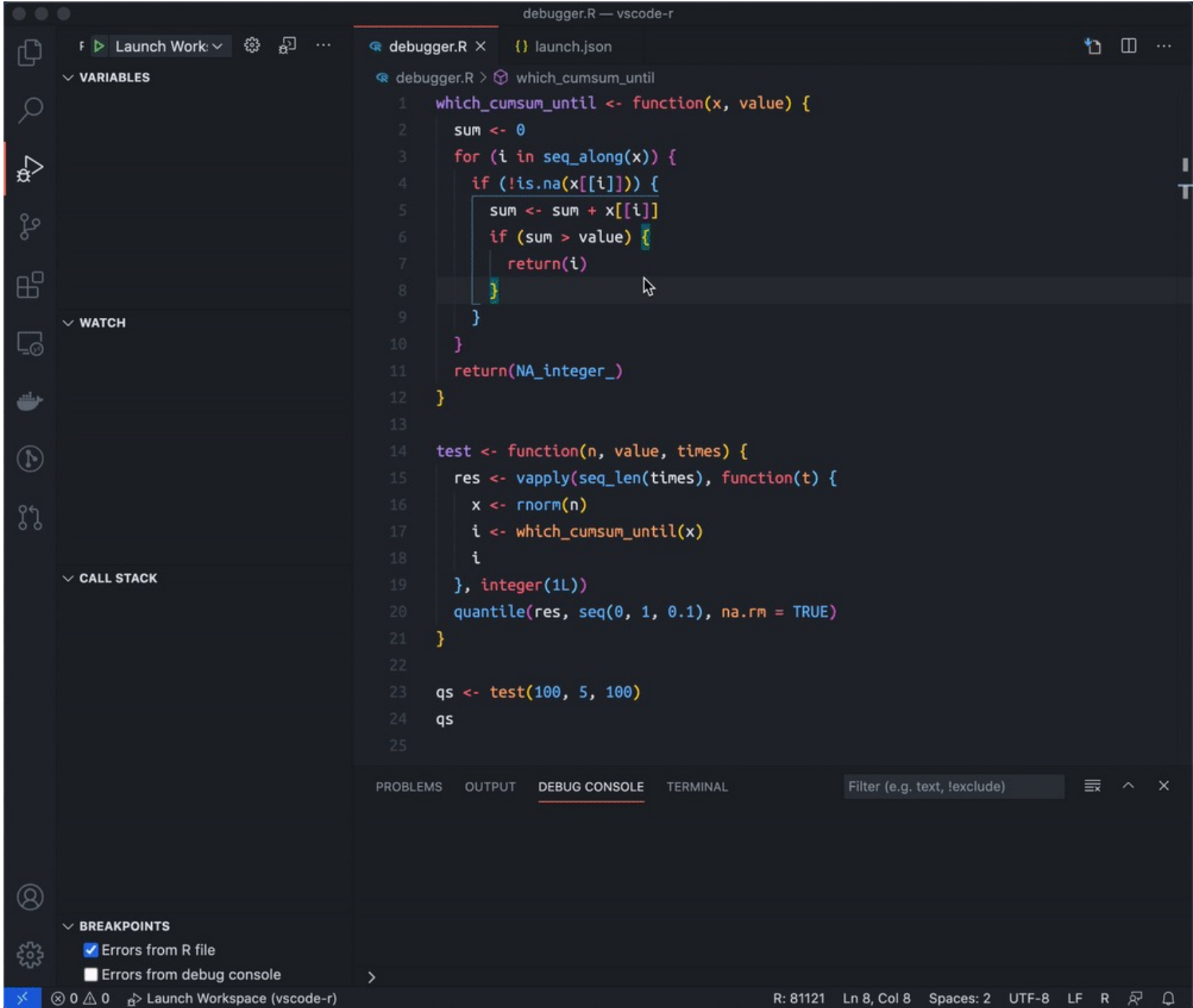
Multi-session support

- Multiple VS Code terminals
- Running R sessions in tmux or screen windows
- Customizable layout with panes and windows
- Persistence with tmux/screen server



VS Code
R Debugger

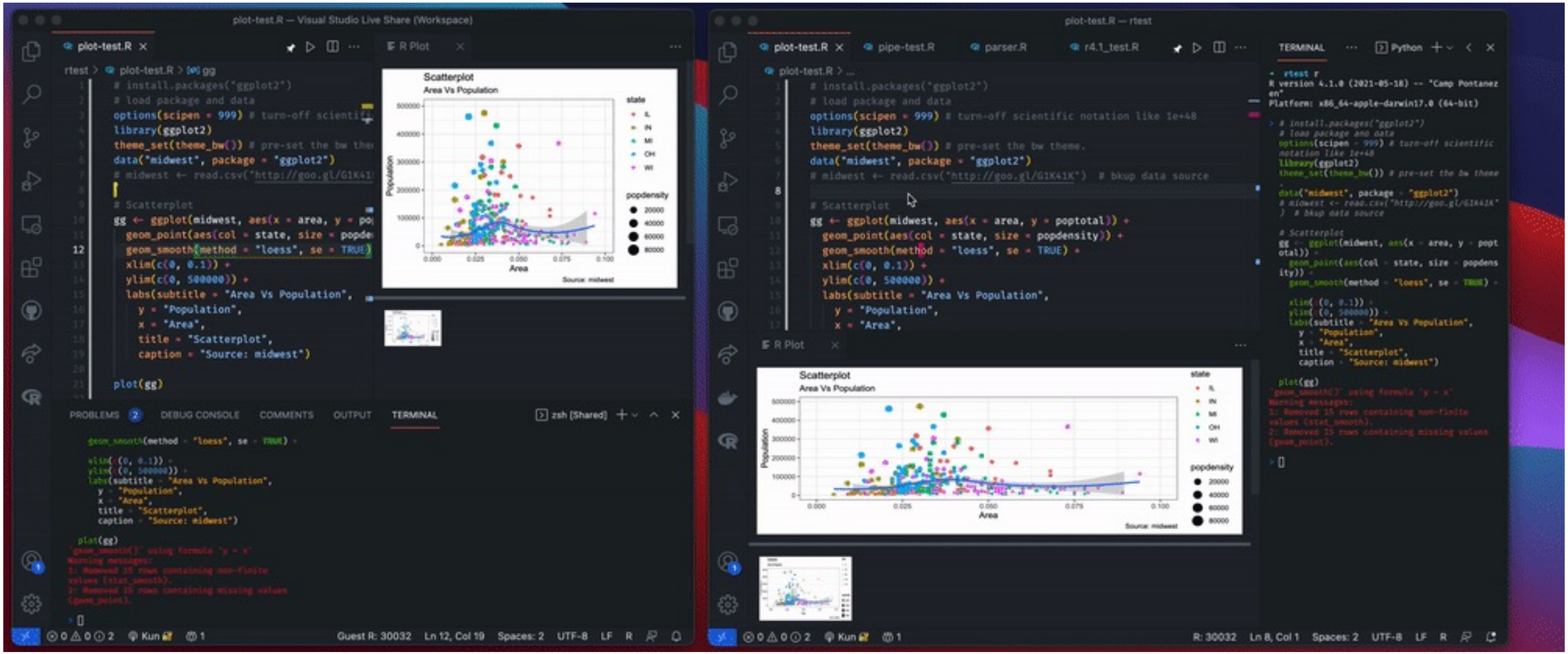
- Debug R script
- Debug R package
- Set breakpoints
- Variables and environments
- Call stack
- Interactive debug console
- Inline viewer on hover



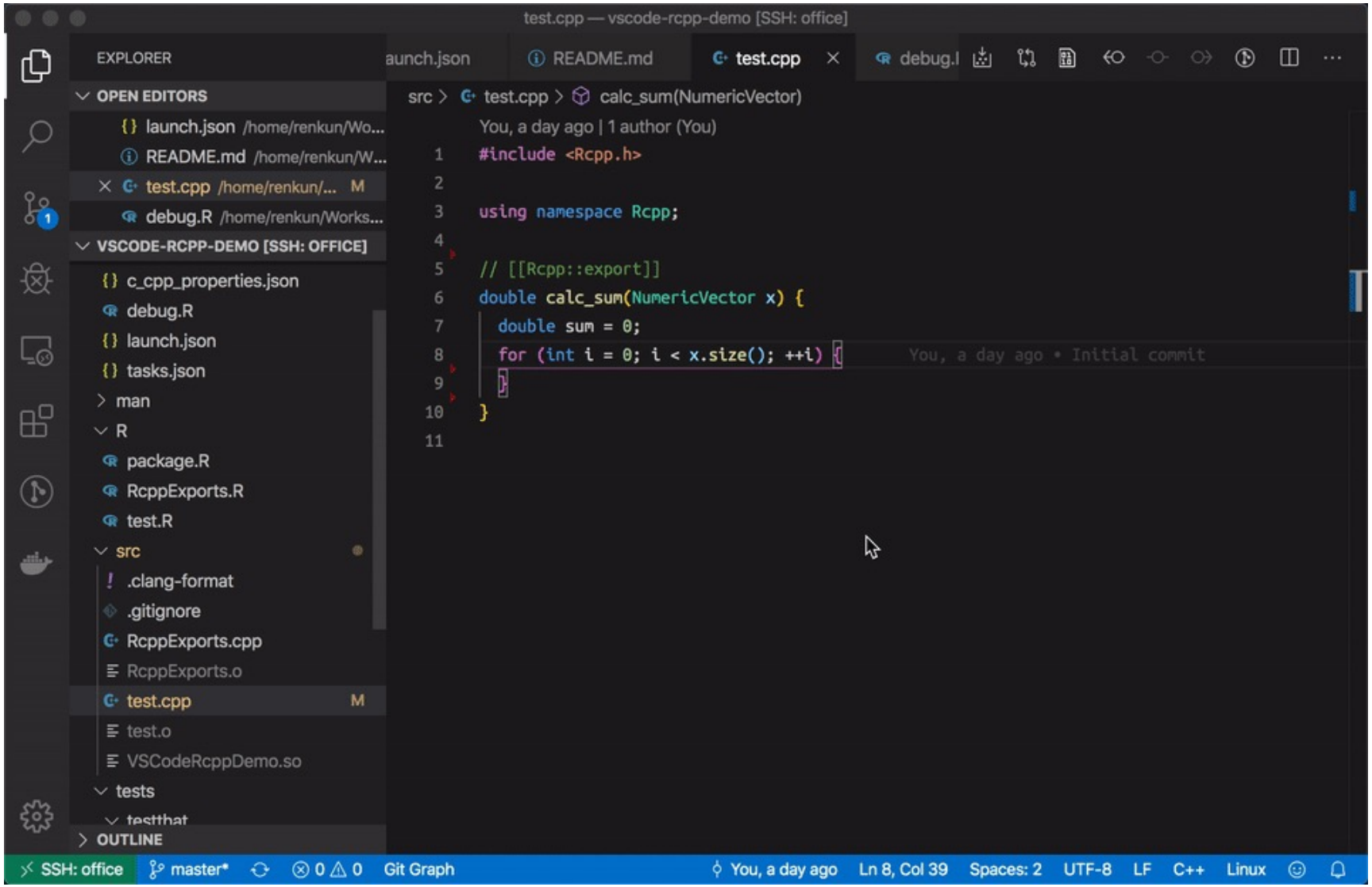
More VS Code extensions

C/C++	Python	Jupiter	Output Colorizer	TODO Highlight
CMake	CMake Tools	Docker	Git Graph	Error Lens
GitLens	markdownlint	Path Autocomplete	vscode-pdf	...

Real-time collaboration via Live Share

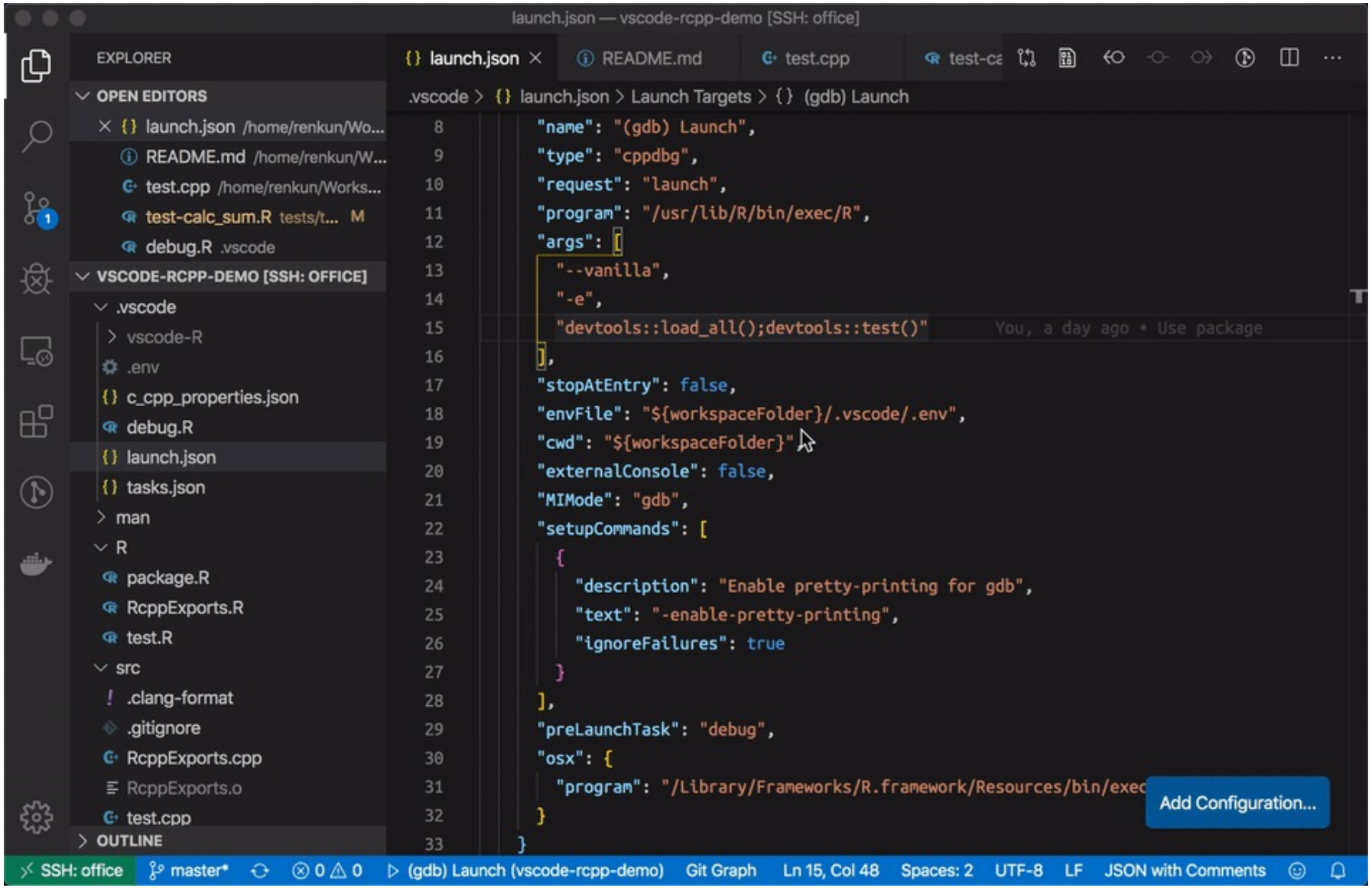


C++ Development with Rcpp/cpp11



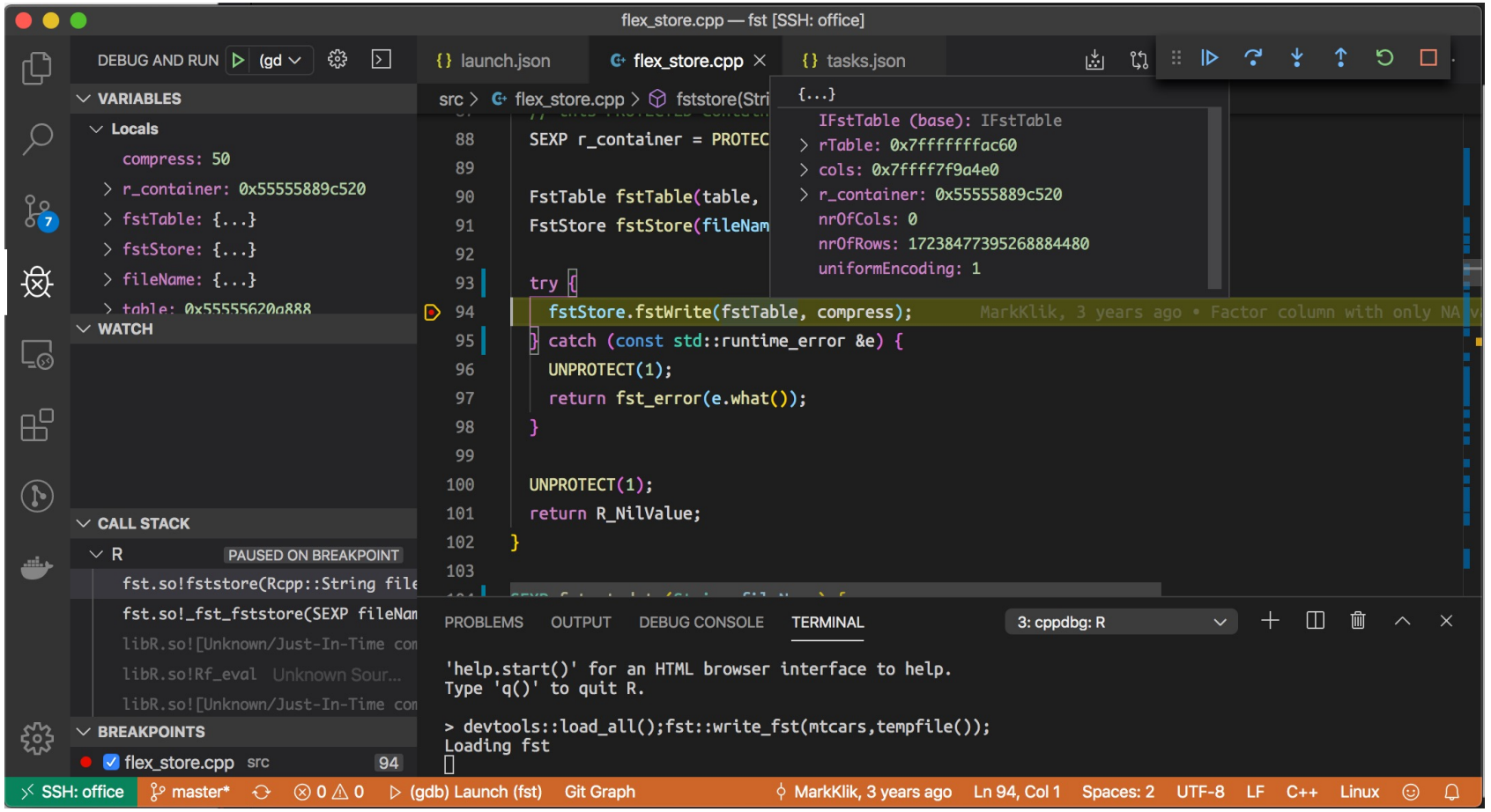
https://github.com/renkun-ken/vscode-rcpp-demo

C++ Debugging with Rcpp/cpp11

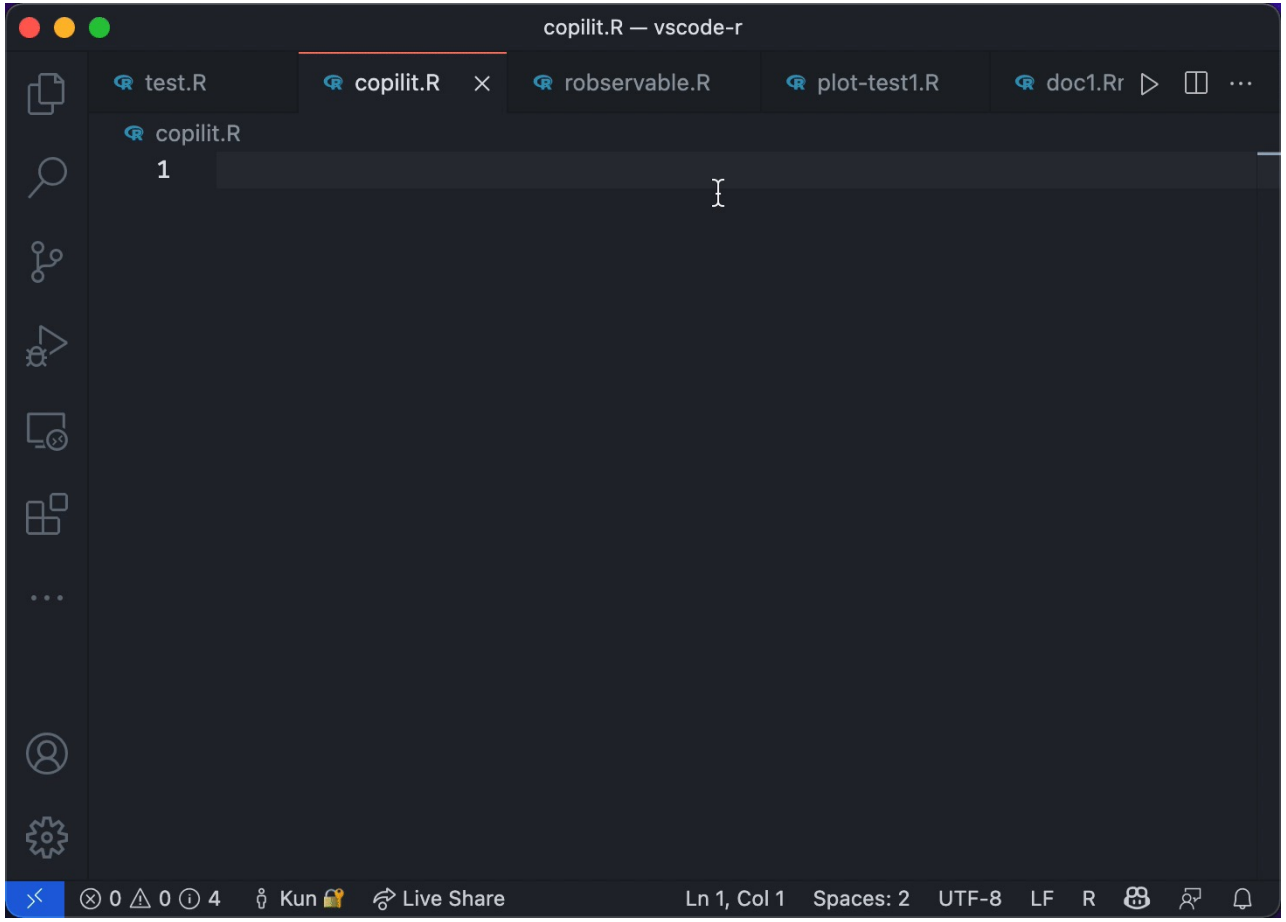


https://github.com/renkun-ken/vscode-rcpp-demo

Remote Development via SSH/WSL/Docker



GitHub Copilot: Your AI pair programmer



https://github.com/REditorSupport/languageserver

https://github.com/REditorSupport/vscode-R

https://github.com/ManuelHentschel/VSCode-R-Debugger

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