

Debugging in RStudio

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June 20, 2018



<https://thumbs.dreamstime.com/b/lousing-monkeys-6160793.jpg>

Base R debug functions

`debugonce()`

`debug()`, `undebug()`

`browser()`

`traceback()`

`options(error = browser)`, `options(error = NULL)`

RStudio IDE debugging tools

- Editor breakpoint
- Browser breakpoint
- Debug mode
 - Source pane highlighting
 - Context-specific Environment pane, including a Traceback panel
 - Browser prompt in Console pane
- “Show traceback” shortcut
- “Rerun with debug” shortcut
- Debug menu

Shiny debugging

```
options(shiny.fullstacktrace = TRUE)
```

```
options(shiny.error = browser)
```

```
browser()
```

Shiny tracing

```
runApp(appDir = "myApp", display.mode = "showcase")
```

```
options(shiny.reactlog=TRUE)
```

```
runApp(...)
```

```
showReactLog()
```

```
cat(file=stderr(), ...)
```

shinyapps.io debugging

```
rsconnect::showLogs(streaming = TRUE)
```

The screenshot shows the shinyapps.io dashboard interface. The top navigation bar includes the logo, a menu icon, and user information (Account: agadrow, Amanda Gadrow). The left sidebar contains navigation links: Dashboard, Applications (selected), All, Running, Sleeping, Archived, and Account. The main content area is titled 'APPLICATION 258800 - DEBUG' and features a row of icons for Overview, Metrics, URLs, Settings, Users, Logs (selected), Restart, Archive, and Delete. Below this is a 'LOGS' section with a 'Download' button. The log output shows a warning message and a stack trace for an error in the `as.matrix` function.

```
2018-01-20T21:30:34.813999+00:00 shinyapps[258800]: Warning: Error in as.matrix: could not find function "selectedDat"
2018-01-20T21:30:34.820090+00:00 shinyapps[258800]: Stack trace (innermost first):
2018-01-20T21:30:34.820100+00:00 shinyapps[258800]: 112: plot
2018-01-20T21:30:34.820091+00:00 shinyapps[258800]: 131: as.matrix
2018-01-20T21:30:34.820101+00:00 shinyapps[258800]: 111: renderPlot [/srv/connect/apps/debug/app.R#33]
2018-01-20T21:30:34.820100+00:00 shinyapps[258800]: 113: plot.data.frame
2018-01-20T21:30:34.820094+00:00 shinyapps[258800]: 129: <reactive:clusters> [/srv/connect/apps/debug/app.R#25]
2018-01-20T21:30:34.820103+00:00 shinyapps[258800]: 90: plotObj
2018-01-20T21:30:34.820093+00:00 shinyapps[258800]: 130: kmeans
2018-01-20T21:30:34.820102+00:00 shinyapps[258800]: 101: <reactive:plotObj>
2018-01-20T21:30:34.820095+00:00 shinyapps[258800]: 118: clusters
2018-01-20T21:30:34.820104+00:00 shinyapps[258800]: 89: origRenderFunc
2018-01-20T21:30:34.820096+00:00 shinyapps[258800]: 117: plot.xy
2018-01-20T21:30:34.820105+00:00 shinyapps[258800]: 88: output$plot1
2018-01-20T21:30:34.820097+00:00 shinyapps[258800]: 116: plot.default
2018-01-20T21:30:34.820106+00:00 shinyapps[258800]: 13: runApp
2018-01-20T21:30:34.820098+00:00 shinyapps[258800]: 115: plot
2018-01-20T21:30:34.820106+00:00 shinyapps[258800]: 12: fn
2018-01-20T21:30:34.820099+00:00 shinyapps[258800]: 114: plot2
2018-01-20T21:30:34.820107+00:00 shinyapps[258800]: 11: doTryCatch
2018-01-20T21:30:34.820115+00:00 shinyapps[258800]: 1: local
2018-01-20T21:30:34.820108+00:00 shinyapps[258800]: 10: tryCatch0ne
2018-01-20T21:30:34.820109+00:00 shinyapps[258800]: 9: tryCatchList
2018-01-20T21:30:34.820109+00:00 shinyapps[258800]: 8: tryCatch
2018-01-20T21:30:34.820111+00:00 shinyapps[258800]: 6: eval
2018-01-20T21:30:34.820110+00:00 shinyapps[258800]: 7: connect$retry
2018-01-20T21:30:34.820112+00:00 shinyapps[258800]: 5: eval
2018-01-20T21:30:34.820113+00:00 shinyapps[258800]: 4: eval
```

RStudio Connect debugging

Content / cars_source_with_source

R Markdown Example

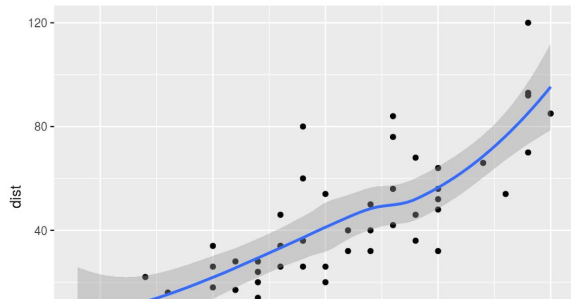
2015-10-01 19:00:00

```
library(ggplot2)
summary(cars)
```

```
##      speed      dist
##  Min.   : 4.0   Min.   : 2.00
##  1st Qu.:12.0   1st Qu.: 26.00
##  Median :15.0   Median : 36.00
##  Mean   :15.4   Mean   : 42.98
##  3rd Qu.:19.0   3rd Qu.: 56.00
##  Max.   :25.0   Max.   :120.00
```

```
ggplot(speed, dist, data=cars) + geom_smooth()
```

```
## `geom_smooth()` using method = 'loess'
```



amanda

Info Access Runtime Schedule Tags **Logs**

Jobs

T734 g7sfpnkfdObmpWD
Document render ran a few seconds ago in a few seconds

T557 dx1VGfihHWWQNTX
Document render ran a minute ago in a few seconds

2 jobs.

Log

Download

```
01/22 20:21:04.718
Using Packrat dir /opt/rstudio-
connect/mnt/app/packrat/lib/x86_64-pc-
linux-gnu/3.3.1
01/22 20:21:04.721
LANG: en_US.UTF-8
01/22 20:21:04.721
R version: 3.3.1
01/22 20:21:04.721
rmarkdown version: 1.3
```

Useful commands in base R

```
debug(), undebug()
debugonce()
browser()
traceback()
options(error = browser), options(error = NULL)
```

Debugging Shiny applications

Automatic `traceback()` in error output, in RStudio and application log
Can set a breakpoint in the server function
Use `browser()` everywhere else (ui, sourced file, etc.)
`options(shiny.error = browser)`
Tracing: `cat(file=stderr(),...), options(shiny.reactlog=TRUE)`

Debug mode in RStudio (from the IDE cheat sheet)

Open with **debug()**, **browser()**, 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

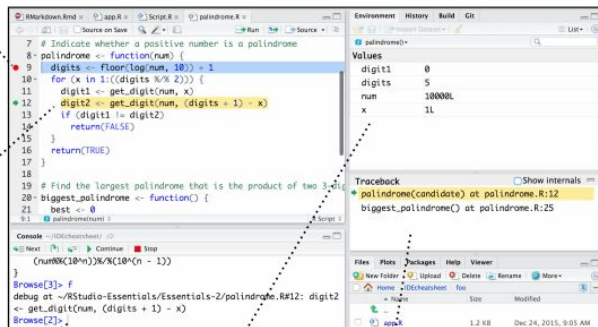
Select function in traceback to debug

Step through code one line at a time

Step into and out of functions to run

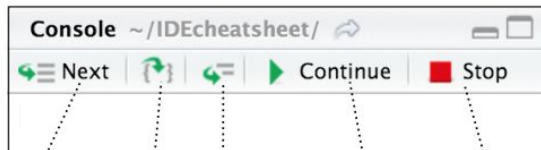
Resume execution mode

Quit debug



Launch debugger mode from origin of error

Open traceback to examine the functions that R called before the error occurred



<https://github.com/rstudio/cheatsheets/raw/master/rstudio-ide.pdf>

Resources

Debugging with RStudio

<https://support.rstudio.com/hc/en-us/articles/205612627-Debugging-with-RStudio>

Debugging Shiny applications

<https://shiny.rstudio.com/articles/debugging.html>

“Debugging, condition handling, and defensive programming” in *Advanced R*

<http://adv-r.had.co.nz/Exception-s-Debugging.html>

