

Short intro to R



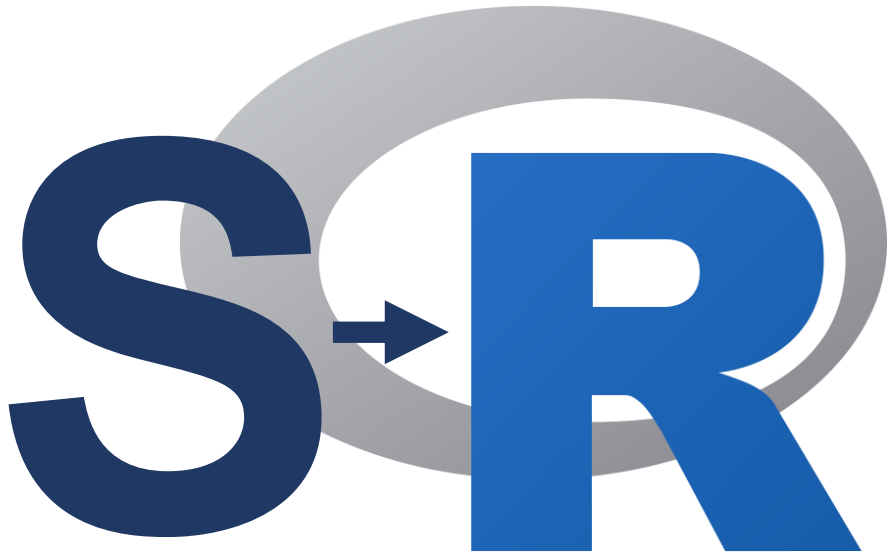
What is R?



Free programming language for
statistical computing and graphics



History of R



- R is a modern and free implementation of S
- Named from the creators (Ross Ihaka and Robert Gentleman)



Features of R



- Has the most comprehensive statistical analysis package which is open-source
- Has the best graphics output (i.e., plotting tools)
- Has very good community support



Limitations of R



- Poor memory management, slow and not efficient
- Some packages are neither published nor tested



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R language run

Demo



Objects, class and variables



- Object - everything in R is called an object
- Class - blueprint of the object
- Variable - a container for any object



RStudio

Parts

The image shows the RStudio application window. The top menu bar includes File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, and Help. Below the menu is a toolbar with icons for file operations and running code. The main workspace is divided into four panes:

- Source**: The top-left pane where R code is written. It contains a script named 'Untitled1*' with the following code:

```
1 square_a_stuff <- function(x){  
2   squared_stuff = x * x  
3   return(squared_stuff)  
4 }  
5
```
- Environment, history**: The top-right pane showing the current environment. It displays 'Global Environment' with a memory usage of 174 MiB. The environment is currently empty.
- Console**: The bottom-left pane where code is executed. It shows the output of the code in the Source pane, including error messages and the result of the function call:

```
R 4.3.0 ~/  
[1] numeric  
> class(class())  
Error in class() : 0 arguments passed to 'class' which requires 1  
> class(c('vector',1))  
[1] "character"  
> squared_stuff = x * x  
Error: object 'x' not found  
> square_a_stuff <- function(x){  
+   squared_stuff  
+ }  
> square_a_stuff(x)  
> return(squared_stuff)  
Error: object 'squared_stuff' not found  
> square_a_stuff <- function(x){  
+   squared_stuff = x * x  
+   return(squared_stuff)  
+ }  
> square_a_stuff(5)  
[1] 25  
> class('6')  
[1] "character"  
> attributes('a')  
NULL  
> class('a')  
[1] "character"  
> dimnames('a')  
NULL  
> names('a')  
NULL  
>
```
- Files, plots, etc.**: The bottom-right pane, which is currently empty. It contains tabs for Files, Plots, Packages, Help, Viewer, and Presentation.



RStudio run

Demo



Quarto

Reproducible codes = reproducible Science!



Next-gen version of RMarkdown



What's RMarkdown, though?

A Data Science authoring tool that lets you combine your code, its results and your comments/instructions



Quarto

Sans Markdown tool vs Quarto

Before 🤔

```
1 # Make a function that squares any number
2 square_a_stuff <- function(x){
3   squared_stuff = x * x
4   return(squared_stuff)
5 }
```

After ❤️

Making a function

Annotation

Make a function that takes any number and turns it to its squared form.

```
{r}
square_a_stuff <- function(x){
  squared_stuff = x * x
  return(squared_stuff)
}
```

Code chunk

Make a sample run of your function.

```
{r}
square_a_stuff(9)
```

```
[1] 81
```



Do Stats in a reproducible way!

Demo

