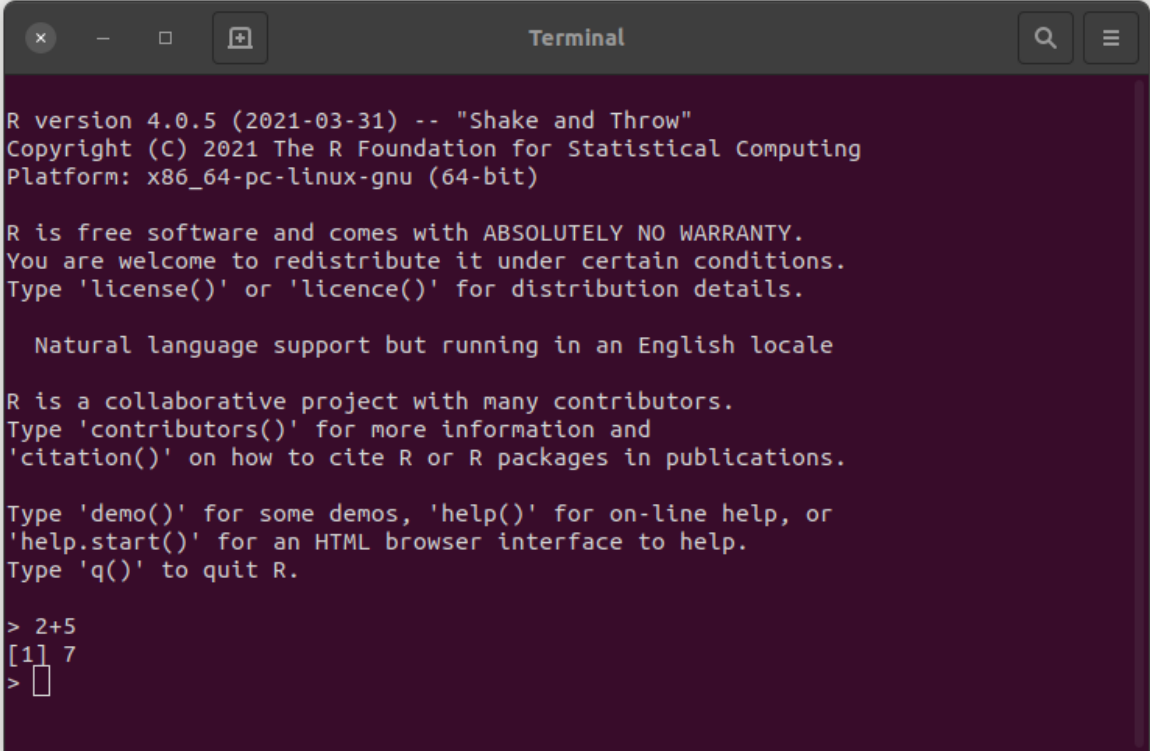


# Introduction

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## R interface



```
R version 4.0.5 (2021-03-31) -- "Shake and Throw"
Copyright (C) 2021 The R Foundation for Statistical Computing
Platform: x86_64-pc-linux-gnu (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.

> 2+5
[1] 7
>
```

## Rstudio walkthrough

- Console
- Environment
- History
- Connections
- Files
- Plots
- Packages
- help
- Viewer
- Knit
- Insert
- Run

- Output Options
- Tools -> Global Options...
- spell-check

## R Basics

### Getting started with help

- `?`, `help()`, `help.start()`, `help.search()`, `vignette()`
- `args`
- `example()`
- `setwd()`
- `getwd()`

### Printing on the screen

- Enter at the command prompt (`>`)
- `print()`
- `cat()`

### Setting variables

- `<-` (less-than and hyphen with no space)
- [dynamically typed language](#)
- `=`
- `->`

### Listing variables

- `ls()`
- `ls.str()`
- `ls(all.names=TRUE)`

### Deleting variables

- `rm()`
- `rm(list = ls())`

### Creating Vectors

- `c(...)`

### Basic statistics

`mean(x)`

- `median(x)`
- `sd(x)`
- `var(x)`
- `cor(x, y)`
- `cov(x, y)`

### Creating sequences

- `n:m`
- `seq()`
- `rep()`

## Comparing vectors

- ==
- !=
- <
- >
- <=
- >=
- any()
- all()

## Selecting elements

- []
- -
- TRUE/FALSE
- |
- &
- is.na()
- is.null()
- !
- names()

## Vector arithmetic

- -/+\*//
- Implement sd() function

## Saving workspace

- save()
- saveRDS()
- save.image()

## Viewing command history

history()

## Running an R script

- source()

## Some common mistakes

- No parentheses after a function call
- < - instead of <-
- Incorrectly continuing expression to next lines
- = instead of ==
- 1:n+1 instead of 1:(n+1)
- Failing to load installed package
- Passing multiple arguments to a single-argument function
- Single backslash (\) in Windows paths

## Packages and Package installation

### Load a package

- `library()` vs `require()`

### Remove loaded packages

- `detach()`

### Access built-in datasets

- `data(dataname, package="pkgname")`

### Install packages from CRAN

- `install.packages()`

### Install packages from github

- `devtools`
- `remotes`