2

R

R

R

R

IBM SPSS

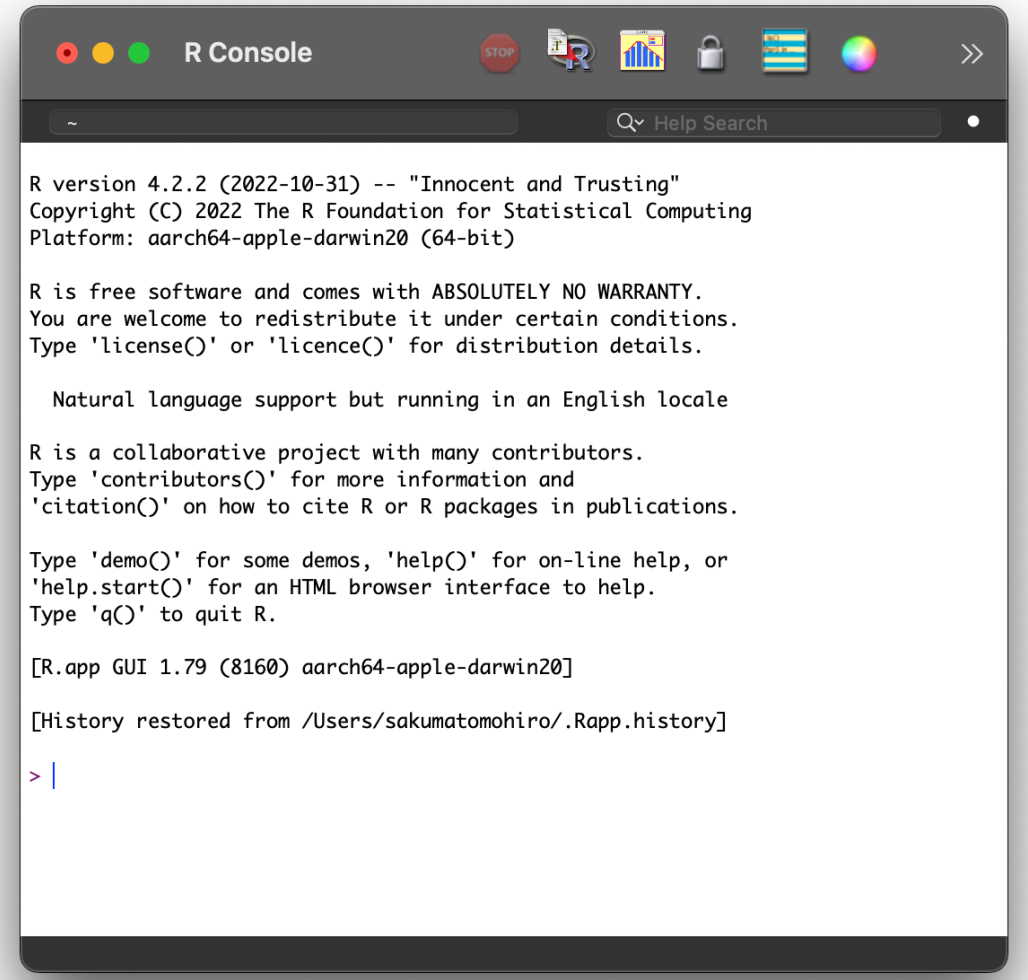
Python R Python R

R R Python

	エクセル	SPSS	STATA	Python	R
便利さ	最悪	簡単操作	良い	Rと同程度	まあ良い
分析の幅	非常に狭い	広い	非常に広い	非常に広い	非常に広い
価格	すでに 入っている	20〜30万？	3〜5万	無料	無料
その他	そもそも表計算ソフト	研究者では嫌いな人も	一番好き	機械学習やアプリ開発 などにも	悔しいけど最近主流

Rstudio

Posit IDE R Windows console Mac terminal


R Console
Help Search
R version 4.2.2 (2022-10-31) -- "Innocent and Trusting"
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.
[R.app GUI 1.79 (8160) aarch64-apple-darwin20]
[History restored from /Users/sakumatomohiro/.Rapp.history]
>

R Rstudio

- R
- R
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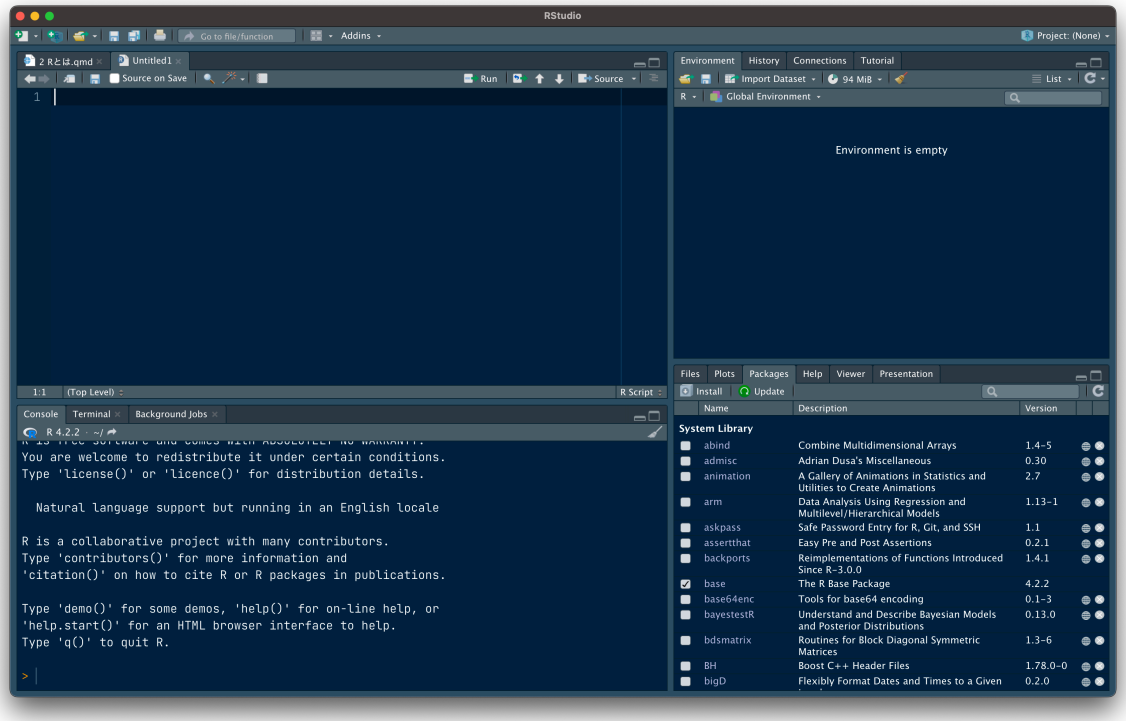


- Rstudio
  - Rstudio
- Rstudio

Google colab Rstudio

R Rstudio

R

1. R https://cloud.r-project.org
2. OS
   - Windows `Download R for Windows`
     - Base
   - Mac `Download R for macOS`
     - Slicon `R-X.X.X-arm64.pkg` Intel `R-X.X.X.pkg`
3.

Rstudio

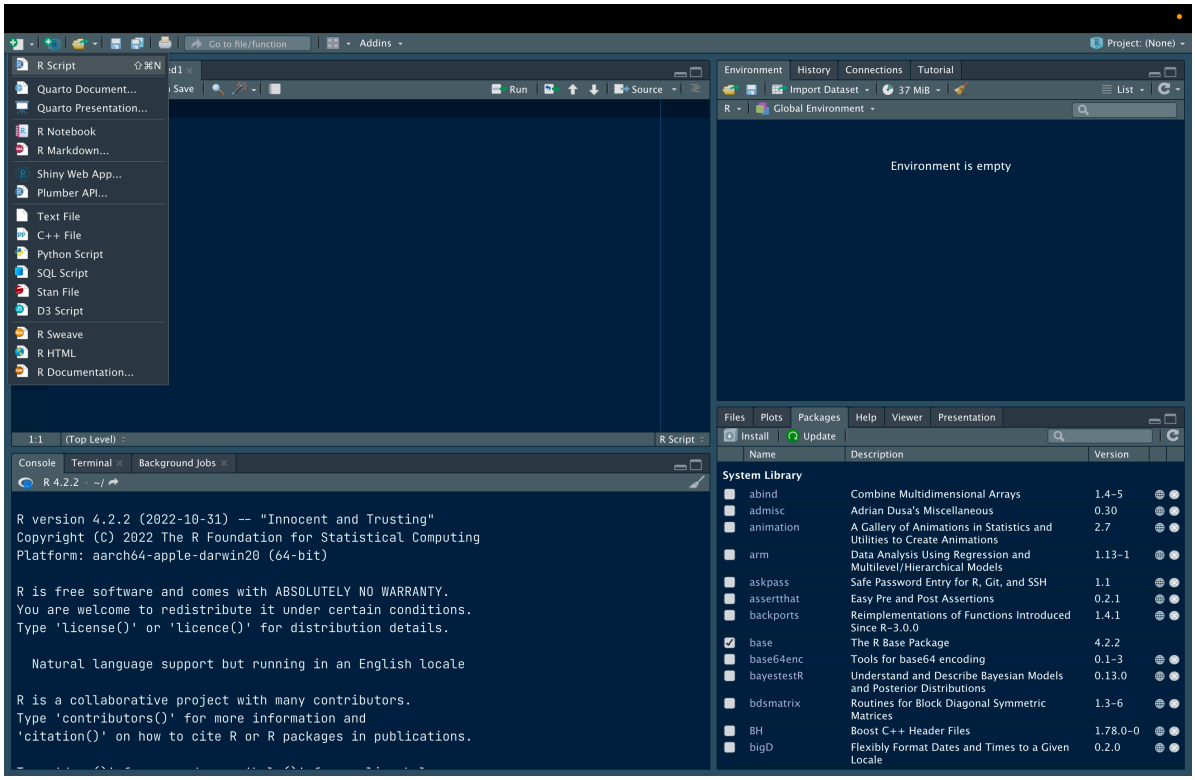
1. RStudio https://posit.co/products/open-source/rstudio/
2. Open Source Edition
3. OS
4.

> X.X.X

R

R R

R Script

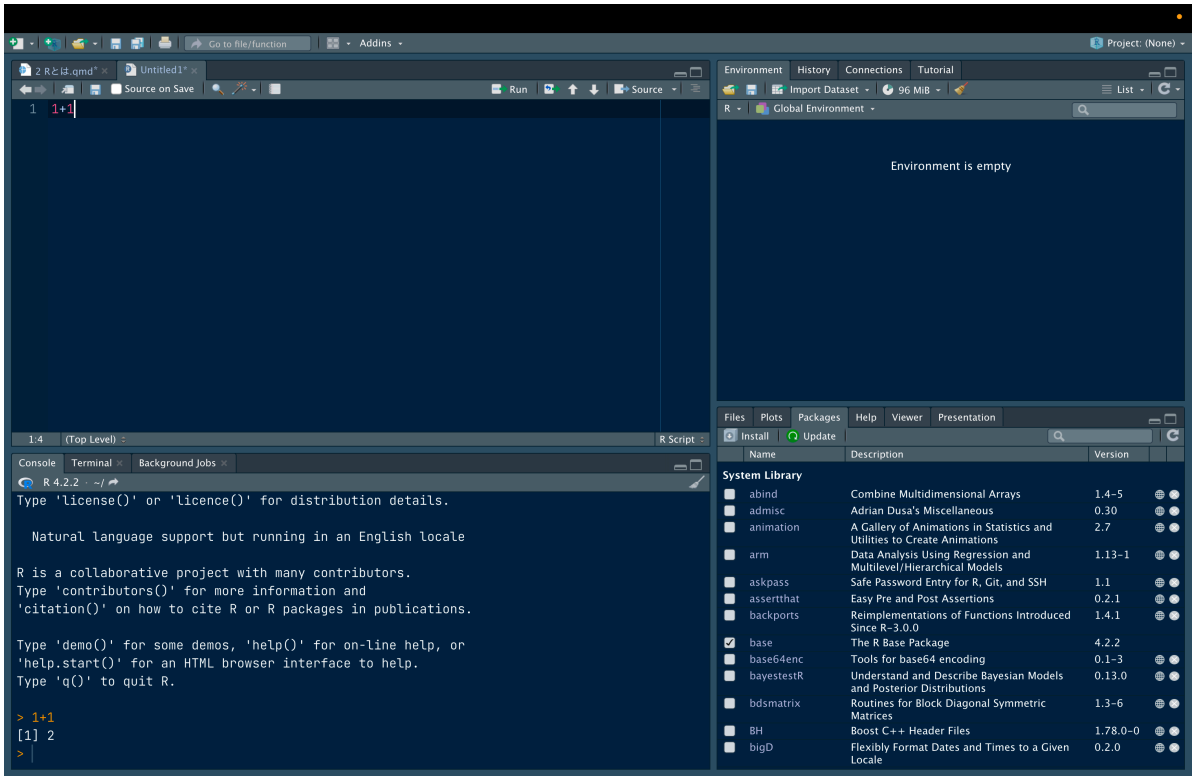


R

```
1 + 1
```

```
[1] 2
```

console `1+1`



R *Run* `Control + Enter` (Mac `+Enter`)

```
1+3 #<1>
2*4 #<2>
4-2 #<3>
4/2 #<4>
2^4 #<5>
```

```
sqrt(16) #<6>
```

```
① ( + )
② ( * )
③ ( - )
④ ( / )
⑤ ^
⑥ sqrt() )
```

```
[1] 4
[1] 8
[1] 2
[1] 2
[1] 16
[1] 4
```

>, ==, != TRUE) FALSE

```
9 > 9
```

```
[1] FALSE
```

```
9 >= 9
```

```
[1] TRUE
```

```
'egg' == 'egg'
```

```
[1] TRUE
```

```
'apple' != 'apple'
```

```
[1] FALSE
```

R

(R) Harvard University / ( )

R Rstudio Environment

```
x <- 1
```

<- x 1 x x x

```
x
```

```
[1] 1
```

```
#print
x <- 3
y <- 5
z <- x * y
print(z) #<1>
```

① z print() z

```
[1] 15
```

```
univ <- "Ritsumeikan University"
univ
```

```
[1] "Ritsumeikan University"
```

Tip

x a english math

```
vec <- c(1, 2, 3, 4, 5)
```

× matrix ncol=2 , byrow=TRUE

```
mat <- matrix(c(435,165,265,135), ncol=2, byrow=TRUE)
mat
```

```
     [,1] [,2]
[1,]  435  165
[2,]  265  135
```

byrow=FALSE

```
mat2 <- matrix(c(435,165,265,135), ncol=2, byrow=FALSE)
mat2
```

```
     [,1] [,2]
[1,]  435  265
[2,]  165  135
```

```
rownames(mat) <- c(" 1", " 2")
colnames(mat)<- c(" 1", " 2")
mat
```

```
    1  2
1 435 165
2 265 135
```

```r
age <- c(18, 21, 22, 23, 34) #
gender <- c("female", "male", "male", "female", "female")#
dframe <- data.frame(age, gender)
dframe
```

```
  age gender
1  18 female
2  21   male
3  22   male
4  23 female
5  34 female
```

$

```r
dframe$gender
```

```
[1] "female" "male"   "male"   "female" "female"
```

R

```r
mean(dframe$age) #<1>
min(dframe$age) #<2>
median(dframe$age) #<3>
```

① mean()
② min() (max())
③ median()

```
[1] 23.6
[1] 18
[1] 22
```

R ( )

- mean(dframe$age)

– (mean)

– dframe age (dframe$age)

R () , ()

```
mat <- matrix(c(435,165,265,135), ncol=2, byrow=TRUE)
```

```
mat <- matrix(
  c(435,165,265,135),
  ncol=2,
  byrow=TRUE
  )
```

```
mat <-
  matrix(
  c(
    435,
    165,
    265,
    135
    ),
  ncol=2,
  byrow=TRUE
  )
```

R

> R OS iOS Android

R tidyverse 1 App Store

```
install.packages(tidyverse)
```

```
library(tidyverse)
```

```
library(magrittr)
library(googledrive)
```

Working Directory

R wd

(Mac wd)

```
setwd("~/Desktop")
```

Rstudio `Files` Set As Working Directory
( )

```
age <- c(18, 21, 22, 23, 34) #
gender <- c("female", "male", "male", "female", "female")#
dframe <- data.frame(age, gender)
```

- google forms google google

csv

csv 10 4

csv

出席番号	math	japanese	history	physics
1	41	35	71	90
2	74	76	30	35
3	65	7	41	75
4	76	24	42	78
5	53	8	47	51
6	29	80	14	19
7	16	48	46	23
8	24	31	82	89
9	73	64	62	84
10	25	55	19	22

wd csv read_csv(" ") read.csv(" ") ( ) tests.csv tests

```
tests <- read_csv("tests.csv")
```

head( )

```
head(tests)
```

```
# A tibble: 6 x 5
      math japanese history physics
     <dbl> <dbl>    <dbl>   <dbl>   <dbl>
1        1    41       35      71      90
2        2    74       76      30      35
3        3    65        7      41      75
4        4    76       24      42      78
5        5    53        8      47      51
6        6    29       80      14      19
```

Google Drive csv

1. google drive
2. url `https://drive.google.com/file/d/*********/view?usp=sharing` ******** id
3. id

```
id = "1x7426qSraIRdcbgW3a0F8vMF181Q_DHF"

z = read_csv(sprintf("https://docs.google.com/uc?id=%s&export=download", id))
```

Dropbox csv

google drive

1. Dropbox
2. `dl=0` `dl=1` `read_csv` (`read.csv`)

```
z2 <- read_csv("https://www.dropbox.com/s/6x344sfra54mcco/tests.csv?dl=1")
```

```
Rows: 10 Columns: 5
-- Column specification --------------------------------------------------------
Delimiter: ","
dbl (5):   , math, japanese, history, physics

i Use `spec()` to retrieve the full column specification for this data.
i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

tidyverse magrittr

1

test (math) [1.5.2][ ][ ] $

```
mean(tests$math)
```

%$%

```
tests %$%
  mean(math)
```

2

1 (1)test (2) (lm) (3) (summary)

```
summary(lm(math ~ japanese + physics ,data = tests))
```

(→ →)

(1) test (2) (3)

```
tests %$%
  lm(math ~ japanese + physics) %>%
  summary()
```

%$% %>%

4 mutate() mutate

```
tests <- tests %>%
  mutate(sum = math + japanese + history + physics)
```

tests tests 1 %<>%

```
tests %<>%
  mutate(sum = math + japanese + history + physics)
```

```
tests %<>%
  rowwise() %>%
  mutate(sum = sum(math, japanese, history, physics)) %>%
  ungroup()
```