

/dgjung0220/R_Study code list

1.test_data_import.R

https://github.com/dgjung0220/R_Study/blob/master/1.test_data_import.R

2.vector_and_so_on.R

https://github.com/dgjung0220/R_Study/blob/master/2.vector_and_so_on.R

3.matrix.R

https://github.com/dgjung0220/R_Study/blob/master/3.matrix.R

4.set_dataframe.R

https://github.com/dgjung0220/R_Study/blob/master/4.set_dataframe.R

5.which.R

https://github.com/dgjung0220/R_Study/blob/master/5.which.R

6.matrix_indexing.R

https://github.com/dgjung0220/R_Study/blob/master/6.matrix_indexing.R

7.array.R

https://github.com/dgjung0220/R_Study/blob/master/7.array.R

8.array(2)_indexing.R

[https://github.com/dgjung0220/R_Study/blob/master/8.array\(2\)_indexing.R](https://github.com/dgjung0220/R_Study/blob/master/8.array(2)_indexing.R)

score.csv

https://github.com/dgjung0220/R_Study/blob/master/score.csv

```
setwd("D:/workspace/R/french-employment-salaries-population-per-town")
getwd()
```

```
list.files()
```

```
result <- read.csv("net_salary_per_town_categories_ansi.csv", header=TRUE, stringsAsFactors =
FALSE)
head(result)
str(result)
class(result)
```

```
# head() 2" Ôt2ù 3pÇtÑ0ÇX ¬ Ç¥ Ç ÅÐ Ç ÎXÕ\ 3pÇtÑ0 °‡ ¬ | ¼ôÂîÉ 2ä. 3pÇtÑ0¬ È 3 ,\ import ´ ÅÈ2"ÉÀ ÖUÇxÕX@0 Ç Ôt À¬Æ©´
# 3pÇtÑ0| import ÅÜÐ¬ µL2" head()Æ@ str()ÇD À¬Æ©ÖtÁ È 3 ,\ import ´ ÅÈ2"ÉÀ ÖUÇx ÕDÆ".
```

```
# str() Ôt2ù 3pÇtÑ0ÇX ¬ 2èÕ\ -lÈp| ¼ôÂîÉ .
# => 'data.frame': "S 3b ö'2â öb #b `ariables:
# => data.frame Ö ÐÜ, 5136¬ ÇX - Î!ÎX, 26¬ ÇX ¼ÀÂ .
# => $ LIBGEO : chr "Amberieu-en-Bugey" "Ambronay" "Arbent" "Attignat" ...
# => $ SNHM14 : num 13.7 13.5 13.5 12.9 13 13.9 12.4 14 11.5 12.4 ...
# => LIBGEO2" character Ö ÐÜ, SNHM14 2" number Ö ÐÜ
```

```
# Vector c(a1,a2,a3,...)
a <- c(1,2,3,4,5)
b <- c("big", "data")
# > a
# [1] 1 2 3 4 5
# > b
# [1] "big" "data"
```

```
c(1,2,4,7,9) + c(6,0,10,11,19)
# [1] 7 2 14 18 28
```

```
c(1,2,5) + c(1,9,2,3,4)
# Warning message:
# In c(1, 2, 5) + c(1, 9, 2, 3, 4) :
# longer object length is not a multiple of shorter object length
# 1,2,5,1,2 ,\ Ç•¹¬Á ¹ßÍ°Á Ç¬¼0Åô´ Å´ ¬ÄÀ°´ Å Ç²ä.
```

```
m <- rbind(c(1,2),c(3,4))
# rbind = row & bound, Õ%oÇ<,\ »6@0
# cbind = column & bound, Åô,\ »6@0
#      [,1] [,2]
# [1,] 1 2
# [2,] 3 4
m[1,1] # 1
m[2,2] # 4
m[,2] # 2 4
m[,1] # 1 3
m[1,] # 1 2
m[2,] # 3 4
```

```
m + 1:4
# + 1:4 => Â Á³ ,\ 1,2,3,4 ¹ ³TÕt|.
#      [,1] [,2]
# [1,] 2 5
# [2,] 5 8
```

```
y <- c(1,3,0,12)
y[c(1,3)] # Î«¼^Éø, Á8¼^Éø ÆÐÁÆ Íæ,% > 1, 0
y[2:4] # # 2,3,4¼^Éø ÆÐÁÆ Íæ,% > 3,0,12
v <- 3:4
y[v]
y[-1] # Î«¼^Éø ÆÐÁÆ¬ È ÆxÕX¬à Íæ,% . > 3 0 12
y[-1:-2] # Î«¼^Éø, ¹¼¼^Éø ÆÐÁÆ¬ È ÆxÕX¬à Íæ,% , > 0 12
```

```
# vectorÇX ®8Ç¬¬ ®8¬à, ¹ÈÈÀ¹É ÆÐÁÆ¹¹ °¹|µL
x[5:length(x)] # 5½∈Ñ0 length®LÉÀ Íæ,%
x[-length(x)] # ¹ÈÈÀ¹É ÆÐÁÆ¹¹ È ¬p
```

```
# sequence
seq(from=12,to=30,by=3) # 12~30®LÉÀ 3Å) °JÁ´Á .. > 12 15 18 21 24 27 30
seq(from=1.1, to=2, length=10) # 1.1½∈Ñ0 2®LÉÀ 10¬ ,\ Ê¼¬¬ Á Íæ,% . > 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0
```

```
# repetition
rep(c(5,12,13),3) # 5,12,13ÇD 3¼^ ¼ ¼ö > 5 12 13 5 12 13 5 12 13
rep(1:3, 2)
rep(c(5,12,13),each=3) # ¬ ÆÐÁÆ|¬ 3¼^ Å) ¼ ¼ö > 5 5 5 12 12 12 13 13 13
```

```
x <- c(6,1:3,12)
x[x>5]
which(x*x>8) # È ¬¬ Çt 8¼ô²ä Ðp ÆÐÁÆ`äÇX 'Ç ÎX' ¼
```

```
## Matrix
```

```
y <- matrix(c(1,2,3,4),nrow=2,ncol=2)
#      [,1] [,2]
# [1,]  1  3
# [2,]  2  4
```

```
y <- matrix(c(1,2,3,4),nrow=2, byrow=T)
# if byrow T,  $\tilde{O}_{\frac{1}{2}} \in \tilde{N}_0 \setminus D_{\tilde{A}} \pm \#CL$ 
#      [,1] [,2]
# [1,]  1  2
# [2,]  3  4
```

```
y <- matrix(c(1,2,3,4),nrow=2, byrow=F)
# default,  $\tilde{A} \hat{\partial} \tilde{E}^{\circ} \tilde{A}$ 
#      [,1] [,2]
# [1,]  1  3
# [2,]  2  4
```

```
y %*% y #  $\tilde{O}_{\infty, \neg} \neg \tilde{n}$ 
3*y     #  $\circ \neg \hat{a} \tilde{A} \hat{D} \tilde{A} \tilde{C} \tilde{E} \tilde{A} \hat{D} * 3$ 
y+y     #  $\tilde{O}_{\infty, \neg} {}^3g \tilde{A} \tilde{H}$ 
y*y     #  $\neg \tilde{A} \hat{D} \tilde{A} \tilde{C} \tilde{E} \tilde{C} \tilde{X} \tilde{E} \neg \tilde{n}$ 
```

```
#  $\tilde{E} \hat{I} \tilde{X} \tilde{O}_{\infty, \neg} \tilde{C} t \tilde{A} \tilde{E} \odot$ 
z <- matrix(c(1,1,1,2,1,0,3,1,0,4,2,0), nrow = 4, byrow = T)
z %*% t(z)
```

```
z[,2:3] #  $\tilde{O}_{\infty} \tilde{C} @ \circ \neg \tilde{P} \tilde{I} \tilde{C}_{\neg} \% \tilde{O} \tilde{X} \neg \hat{a}, 2, 3 \frac{1}{4}^{\wedge} \tilde{A} \hat{\partial} \tilde{I} \tilde{I} \tilde{I} \tilde{C}_{\neg} \%.$ 
z[-2,]  #  $2 \tilde{O}_{\infty} \tilde{E} \tilde{A} \tilde{E} x \tilde{O} \tilde{X} \neg \hat{a} \circ \neg \tilde{P} \tilde{I} \tilde{C}_{\neg} \%.$ 
```

```
# dimension
#  $z \tilde{O}_{\infty, \neg} \tilde{C} t \circ \dagger \tilde{O}_{\infty} \circ \dagger \tilde{A} \hat{\partial} \tilde{C} x \tilde{E} \hat{A} \tilde{I} \tilde{C}_{\neg} \%.$ 
dim(z) # 4 3
dim(z)[1] ##  $z \tilde{O}_{\infty, \neg} \tilde{C} \tilde{X} \tilde{O}_{\infty} \tilde{I} \tilde{C}_{\neg} \%$ 
dim(z)[2] ##
```

```
# apply
z <- matrix(c(1,2,3,4,5,6), nrow=3, byrow=T)
apply(z,1,mean)      #  $\tilde{O}_{\infty} \tilde{O} \tilde{E} \neg \hat{a} 1.5 3.5 5.5$ 
apply(z,2,mean)      #  $\tilde{A} \hat{\partial} \tilde{O} \tilde{E} \neg \hat{a} 3 4$ 
apply(z,1,sum)        #  $\tilde{O}_{\infty} \tilde{C} \tilde{X} \tilde{O} i 3 7 11$ 
apply(z,2,sum)        #  $\tilde{A} \hat{\partial} \tilde{C} \tilde{X} \tilde{O} i 9 12$ 
## @0DÄ.. tapply, sapply, lapply
```

```
kids = c("Tom","Jerry")
ages = c(12,10)
```

```
# data.frame
d <- data.frame(list(kids=c("Tom","Jerry"),ages=c(12,10)))
```

```
# data.frame
sample <- data.frame(matrix(ncol=3, nrow=5))
#   X1 X2 X3
# 1 NA NA NA
# 2 NA NA NA
# 3 NA NA NA
# 4 NA NA NA
# 5 NA NA NA
```

```
sample <- as.data.frame(matrix(ncol=3))
#   V1 V2 V3
# 1 NA NA NA
colnames(sample) <- c("col1", "col2", "col3")
#   col1 col2 col3
# 1   NA   NA   NA
```

```
##
setwd("D:/workspace/R")
score <- read.csv("score.csv", header=TRUE)
head(score)
str(score)
```

```
score[2:5,]
score[2:5,1]
# 5 1 2 10
score[2:5,1, drop = FALSE] # drop = FALSE,
# 5
# 1
# 2
# 10
```

```
# data frame
# 1. matrix
score[2:3,1:2]
score[2:3,"test1"]
# 2. column
score$test1[2:3]
# 3. TRUE, FALSE
index_v <- rep(FALSE, 11)
index_v[2:4] <- TRUE
index_v
# FALSE TRUE TRUE TRUE FALSE FALSE FALSE FALSE FALSE FALSE
```

index_v ÅĐÁ TRUEÇx Õ%o!İ Íæ,% 2,3,4 Õ%
score[index_v, 1] # 5 1 2

```

setwd("D:/workspace/R")
score <- read.csv("score.csv", header = TRUE)
# test1 test2 final
# 1 3 2 1
# 2 5 4 5
# 3 1 2 5
# 4 2 9 10
# 5 10 10 10
# 6 9 8 9

```

```

head(score)
str(score)

```

```

index_v <- rep(FALSE, 11)
index_v[2:5] <- TRUE
# FALSE TRUE TRUE TRUE TRUE FALSE FALSE FALSE FALSE FALSE

```

```

index_which <- which(index_v)
# 2 3 4 5

```

```

score[index_which, 1]
# 5 1 2 10

```

```

# 3 ¼â²ä Ç‘Ç@ ¬ ‘äÇX Ç ÎX
index_v <- score$test1<3
score[index_v, 1]
# 1 2 1

```

```

index_which <- which(score$test1 < 3)
# 3 4 9
score[index_which,1]
# 1 2 1

```

```

index <- rep(FALSE, 11 * 3)
index[13:14] <- TRUE
index_matrix <- matrix(index, ncol=3)
#      [,1] [,2] [,3]
# [1,] FALSE FALSE FALSE
# [2,] FALSE TRUE FALSE
# [3,] FALSE TRUE FALSE
# [4,] FALSE FALSE FALSE
# [5,] FALSE FALSE FALSE
# [6,] FALSE FALSE FALSE
# [7,] FALSE FALSE FALSE
# [8,] FALSE FALSE FALSE
# [9,] FALSE FALSE FALSE
# [10,] FALSE FALSE FALSE
# [11,] FALSE FALSE FALSE
score[index_matrix]

```



```
# 4 2
which(index_matrix)
# 13 14
```

```
setwd("D:/workspace/R")
score <- read.csv("score.csv", header = TRUE)
```

```
str(score)
head(score)
#  test1 test2 final
# 1    3    2    1
# 2    5    4    5
# 3    1    2    5
# 4    2    9   10
# 5   10   10   10
# 6    9    8    9
```

```
index <- rep(FALSE, 11*3)
index[13:14] <- TRUE
index_matrix <- matrix(index, ncol=3)
#      [,1] [,2] [,3]
# [1,] FALSE FALSE FALSE
# [2,] FALSE  TRUE FALSE
# [3,] FALSE  TRUE FALSE
# [4,] FALSE FALSE FALSE
# [5,] FALSE FALSE FALSE
# [6,] FALSE FALSE FALSE
# [7,] FALSE FALSE FALSE
# [8,] FALSE FALSE FALSE
# [9,] FALSE FALSE FALSE
#[10,] FALSE FALSE FALSE
#[11,] FALSE FALSE FALSE
```

```
score[index_matrix]
# 4 2
which(index_matrix)
# 13 14
```

```
letters
# "a" "b" "c" "d" "e" "f" "g" "h" "i" "j" "k" "l" "m" "n" "o" "p" "q" "r" "s" "t" "u" "v" "w" "x" "y" "z"
```

```
length(letters)
# 26
```

```
###
#Usage array(data = NA, dim = length(data), dimnames = NULL)Argumentsdata
#
```

```
array(letters,dim=c(2))
# "a" "b"
letters[1:2]
# "a" "b"
```

```
array(letters, dim=c(2,4))
#      [,1] [,2] [,3] [,4]
# [1,] "a"  "c"  "e"  "g"
# [2,] "b"  "d"  "f"  "h"
```

```
matrix(letters[1:8], nrow=2, ncol=4)
#      [,1] [,2] [,3] [,4]
# [1,] "a"  "c"  "e"  "g"
# [2,] "b"  "d"  "f"  "h"
```

```
array(letters, dim=c(2,3,2))
# , , 1
```

```
# [,1] [,2] [,3]
# [1,] "a"  "c"  "e"
# [2,] "b"  "d"  "f"
```

```
# , , 2
```

```
# [,1] [,2] [,3]
# [1,] "g"  "i"  "k"
# [2,] "h"  "j"  "l"
```

```
array(letters, dim=c(2,3,2,2))
# , , 1, 1
```

```
# [,1] [,2] [,3]
# [1,] "a"  "c"  "e"
# [2,] "b"  "d"  "f"
```

```
# , , 2, 1
```

```
# [,1] [,2] [,3]
# [1,] "g"  "i"  "k"
# [2,] "h"  "j"  "l"
```

```
# , , 1, 2
```

```
# [,1] [,2] [,3]
# [1,] "m"  "o"  "q"
# [2,] "n"  "p"  "r"
```

```
# , , 2, 2
```

```
# [,1] [,2] [,3]
# [1,] "s"  "u"  "w"
# [2,] "t"  "v"  "x"
```

```
### dimnames Ö\Æ©
v1 <- c("1Ö%", "2Ö%")
v2 <- c("1Åô", "2Åô", "3Åô")
v3 <- c("1°t", "2°t")
```

```
matrix(letters[1:6], nrow=2, ncol=3, dimnames = list(v1,v2))
#   1Åô 2Åô 3Åô
# 1Ö% "a" "c" "e"
# 2Ö% "b" "d" "f"
```

```
array(letters, dim=c(2,3,2), dimnames = list(v1,v2,v3))
# , , 1°t
```

```
#   1Åô 2Åô 3Åô
# 1Ö% "a" "c" "e"
# 2Ö% "b" "d" "f"
```

```
# , , 2°t
```

```
#   1Åô 2Åô 3Åô
# 1Ö% "g" "i" "k"
# 2Ö% "h" "j" "l"
```

```
ar<-array(letters, dim=c(2,3,2))
# , , 1
```

```
#   [,1] [,2] [,3]
# [1,] "a" "c" "e"
# [2,] "b" "d" "f"
```

```
# , , 2
```

```
#   [,1] [,2] [,3]
# [1,] "g" "i" "k"
# [2,] "h" "j" "l"
```

```
ar[4:8]
# "d" "e" "f" "g" "h"
ar[2,2,]
# "d" "j"
ar[2,2, 1:2]
# "d" "j"
```

```
ar2 <- array(letters, dim=c(2,3,2,2))
# , , 1, 1
```

```
#   [,1] [,2] [,3]
# [1,] "a" "c" "e"
# [2,] "b" "d" "f"
```

```
# , , 2, 1
```

```
#   [,1] [,2] [,3]
# [1,] "g" "i" "k"
# [2,] "h" "j" "l"
```

```
# , , 1, 2
```

```
#   [,1] [,2] [,3]
# [1,] "m" "o" "q"
# [2,] "n" "p" "r"
```

```
# , , 2, 2
```

```
#   [,1] [,2] [,3]
# [1,] "s" "u" "w"
# [2,] "t" "v" "x"
```

```
ar2[12:15]
# "l" "m" "n" "o"
ar2[2,3,1:2,2]
# "r" "x"
```

```
#####
ar <- array(letters, dim=c(2,3,2))
# , , 1
```

```
#   [,1] [,2] [,3]
# [1,] "a" "c" "e"
# [2,] "b" "d" "f"
```

```
# , , 2
```

```
#   [,1] [,2] [,3]
# [1,] "g" "i" "k"
# [2,] "h" "j" "l"
```

```
ar[4:8]
# "d" "e" "f" "g" "h"
ar[2,2,]
# "d", "j"
ar[2,2,1:2]
# "d", "j"
```

```
ar2 <- array(letters, dim=c(2,3,2,2))
# , , 1, 1
```

```
#   [,1] [,2] [,3]
# [1,] "a" "c" "e"
# [2,] "b" "d" "f"
```

```
# , , 2, 1
```

```
#   [,1] [,2] [,3]
# [1,] "g" "i" "k"
# [2,] "h" "j" "l"
```

```
# , , 1, 2
```

```
#   [,1] [,2] [,3]
# [1,] "m" "o" "q"
# [2,] "n" "p" "r"
```

```
# , , 2, 2
```

```
# [,1] [,2] [,3]
# [1,] "s" "u" "w"
# [2,] "t" "v" "x"
```

```
ar2[12:15]
# "l" "m" "n" "o"
ar2[2,3,,2]
# "r", "x"
ar2[2,3,1:2,2]
# "r", "x"
```

```
#####
index <- rep(FALSE, 2*3*2*2)
index[12:15] <- TRUE
ar2[index]
# "l" "m" "n" "o"
index_matrix <- array(index,dim=c(2,3,2,2))
ar2[index_matrix]
# "l" "m" "n" "o"
```

```
# Èp-tÂÝ
ar2 %in% c("l","m","n","o")
# [1] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
TRUE TRUE TRUE TRUE FALSE FALSE FALSE FALSE
# [21] FALSE FALSE FALSE FALSE
```


