

# Lab1

## 1. Learning RStudio

### 1.1 Four panels in RStudio

### 1.2 Creat a R script in RStudio

### 1.3 Note and section in R:

```
1 # (note you give to the code)
2 # this code is used for calculating the mean value
3 mean()
4
5 # this is the section ----
6 # this is the section ====
7 # this is the section #####
```

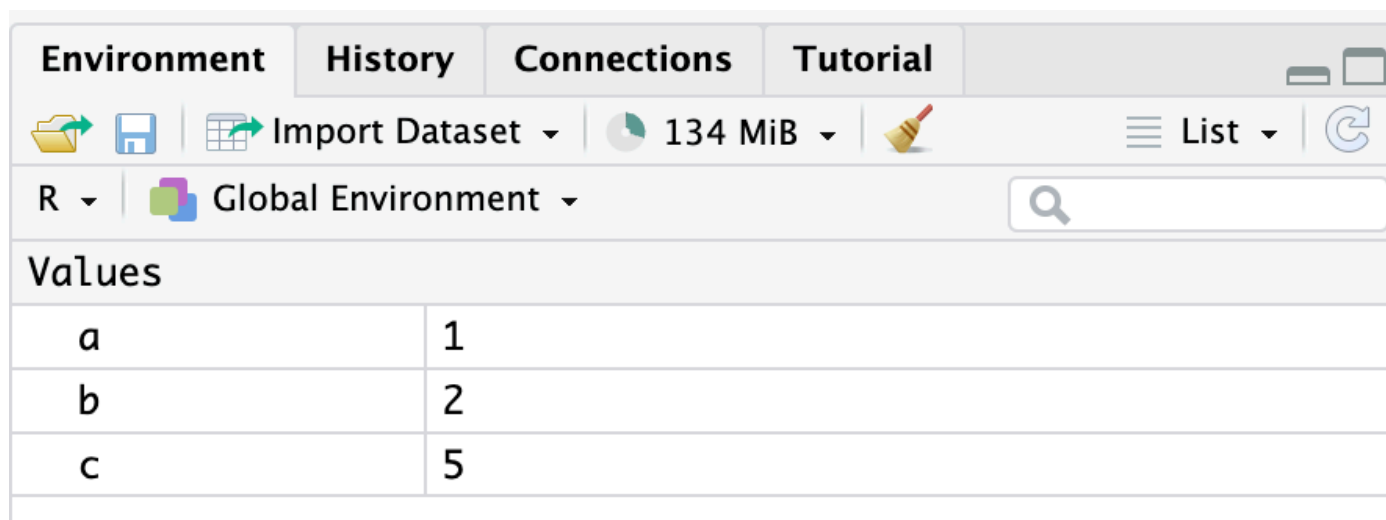
### 1.4 Help in R:

```
1 # help(function name)
2 help(mean)
3 # help(package = "package name")
4 help(package = "BAS")
```

## 2. Basical operations

### 2.1 Mathematical operations

```
1 # try =, +, -, *, \, ^ in different variables
2 a = 1
3 b <- 2
4 c = a + b^2
```



The screenshot shows the RStudio interface with the Environment pane active. The pane displays the Global Environment with three variables: a, b, and c. The values are 1, 2, and 5 respectively. The interface includes tabs for Environment, History, Connections, and Tutorial. The Environment tab is selected, showing a search bar and a list of variables.

Values	
a	1
b	2
c	5

## 2.2 Comparison and logical operations

```
1 # Comparison operations: >, <, ==, !=, >=, <=
2 l1 = c(1,2)
3 l2 = c(3,4)
4 print(l1==l2)
5 print(l2>=l1)
```

[4] FALSE FALSE

[5] TRUE TRUE

```
1 # Logical operations : &, |, !
2 m = 2
3 print((m>1) & (m=2))
```

[1] TRUE

## 2.3 Data structure

```
1 # matrix, vector, Dataframe
2 vec_1 <- c(1,2,3)
3 vec_2 <- c('bag', 'book', 'pencil')
4 matrix_1 <- matrix(1:6, nrow = 2)
5 data_frame <- data.frame(vec_1, vec_2)
6 # list
7 list <- c(vec_1, vec_2, matrix_1, data_frame)
```

Environment

History

Connections

Tutorial

Import Dataset

143 MiB

List

R

Global Environment

Data

data\_frame

3 obs. of 2 variables

matrix\_1

int [1:2, 1:3] 1 2 3 4 5 6

Values

vec\_1

num [1:3] 1 2 3

vec\_2

chr [1:3] "bag" "book" "pencil"

## 3. Function

### 3.1 Basic function

```
1  # function_name <- function(a,b,...){
2    # formula
3    # return
4    # }
5
6  fun1 <- function(a,b){
7    c = a*b+1
8    return (c)
9  }
10 fun1(1,2)
```

```
1  x = c(1,2,3)
2  min(x)
3  max(x)
4  sum(x)
5  sum(x>3)
6  which(x>2)
7  prod(x)
8  sqrt(x)
9  exp(x)
10 log(9,3)
```

```
[2] 1
[3] 3
[4] 6
[5] 0
[6] 3(index)
[7] 6
[8] 1.000000 1.414214 1.732051
[9] 2.718282 7.389056 20.085537
[10] 2
```

### 3.2 summary statistics functions

```
1  mean(x)
2  var(x)
3  sd(x)
4  summary(M)
```