Introduction to R 1

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Why Use R?

It’s totally free

Contents

- Basic
- Vector
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- Factors
- Data Frame
- Lists
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Basic

Variable

```
x <- 2

x <- 5
```

Data Type

- Numeric
- Characters
- Date
- Logical

class(variable) > return the data type

Math Operations

A = 10

B = 2

Operations:

`A + B`	`A / B`	`A ** B`
`A - B`	`A %% B` (mod)	`A ^ B` (the same as above)
`A * B`	`A %/% B` (integer division)	

Conditional Structures

```
If (statement){
    actions
}else{
    actions
}
```

```
If (statement){
    actions
}ifelse{
    actions
}else{
    action
}
```

Conditional Structures

```
if(statement, True, False)
```

Loop

```
for (statement){
    action
}

while (statement){
    action
}
```

Quiz

```
fruits <- c("Apple", "Orange", "Banana")
```

How to get result like:

```
[1] "Apple"
```

```
[1] "Banana"
```

function

```
hello <- function(){
  print("Hello World")
}

hello()

Out:
[1] "Hello World"
```

Vector

Create a Vector

```
wallet <- c(100,10,20,15,10,40,90)
```

Naming

```
names(wallet) <- c(“minggu”, “senin”, “selasa”, “rabu”,
“kamis”, “jumat”, “sabtu”)
```

Do with Vector

```
sum(wallet)

mean(wallet)

sqrt(wallet)
```

```
vec_a + vec_b

vec_a - vec_b

vec_a * vec_b

vec_a / vec_b
```

Slicing

```
vec_a[c(1,2,3)]

vec_a[c(2:3)]

vec_a[c(“senin”, “rabu”, “jumat”)]

selected <- vec_a  > 10

vec_a[selected]
```

Matrices

Creating a Matrix

```
mat <- matrix(1:9, byrow = TRUE, nrow=3)
```

Matrix compose by vector

```
mat2 <- matrix(c(vec_a, vec_b, vec_c), byrow=TRUE, nrow = n)
```

Naming a Matrix

```
colnames(matrix) <- c(string)

rownames(matrix) <- c(string)


matrix(vector, byrow=TRUE, nrow=n, dimnames=list(vector,
vector))
```

Adding a Row and Column

```
cbin(matrix1, matrix2)

rbin(matrix1, matrix2)
```

Slicing

```
matrix[row_by_indx, col_by_index]

matrix[row_by_name, col_by_index)]
```

Matrix Operations

```
rowSums(matrix)

colSums(matrix)

mean(matrix)

sum(matrix)

matrix_a <math op> matrix_b | scalar
```

Factor

Creating a Factor

The term factor refers to a statistical data type used to store categorical variables.

```
factor(<vector>)

factor(<vector>, order = TRUE, levels = <vector>)
```

Factor

summary(factor)

Data Frame

Creating a Data Frame

```
df <- data.frame(vector_1, vector_2, vector_n)

str(df)
```

Slicing

```
df$col_name

df[row_by_index, col_by_index]

df[row_by_index, col_by_name]

selected <- df[col > n]

df[selected]

subset(df, subset = df$col_name > statement)

df[order(df$col), ]
```

Lists

Making a List

```
var_list <- list(vector, matrix, dataframe)

names(var_list) <- vector
```

Make it simpler

```
var_list <- list(name1 = vector, name2 = matrix, name3 = dataframe)
```

Slicing

```
list$name_sub

list[[index]]
```

Git

Git on R Studio

- Setup Git
- Tools > Global Options

Getting Started Git with Github

- Git clone
- Git add
- Git commit
- Git push
- Git pull
- Git branch