

Basic of basic

print no need any other exp

exponentiation ^

modulo %%

assignment = or <-

equal sign ==

case sensitive YES

or |

double operators &&, || only examine 1st elements in vectors

Factor

factor()

2 types nominal vs. ordinal

Data structures

vector c() one dim-array, same data type, arithmetic calculations OK, names()

matrix two dim-array, same data type, arithmetic calculations OK

data frame two dim-object, different data types

list 1 dim object, different data types

df is a list where each element is a column so df[[col]] equals column

FUNCTION

fun <- function(arg1, arg2) {...}

3 elements: arguments, body, environment

return() stop execution and return a value, used to return early for special cases not routinely

functions are objects

descriptive, use consistent naming convention, no overriding existing object names, data args come first

functions can be arguments to other functions --> functional programming

pipe operator: %>%

FUNCTION (cont)

safely(), possibly(), quietly() - handling errors

side effects: beyond the results of a function, i.e. print output, plot, save files to disk

3 main problems: type-unstable functions([, sapply), non-standard evaluation, hidden arguments

stop("error msg", call. = FALSE)

view global options: options(), getOption("digits")

purrr - map(), map_dbl(), map_int(), etc. apply the same function to a list. Similar to the apply family - sapply(), lapply() map2(.x, .y, .f, ...), pmap(.l, .f, ...) - multiple args

invoke_map(.f, .x = list(NULL), ...) - multiple functions

walk() similar to map() but for side effects

Basic functions

class() str()

rbind(), colSums(), rowSums(), nrow(), cbind() ncol()

data.frame() order(), arrange(), rank() subset()

file.path() return file path

seq_along() generate sequence for "for loop" can handle empty cases

Subsetting

starts from 1

[2:5] equals to c(2,3,4,5)

df[, 1] 1st column

df[1,] 1st row

df[2,3] 2nd row & 3rd column

df\$x select element name x

ls[x] vs. ls[[x]] or \$ sublist vs. element

IF Syntax

```
if (condition1) {
  ex1
} else if (condition2) {
  ex2
} else {
  ex3
}
```

FOR syntax

```
for (i in list) {
  print(i)
}
for (i in 1:length(list)) {
  print(list[[i]])
}
```

break & next

break - abandons the active loop: the remaining code in the loop is skipped and the loop is not iterated over anymore.
next - skips the remainder of the code in the loop, but continues the iteration.

Importing data

read.csv(), read.delim()

read.csv2(), read.delim2() - local diff. in decimal convention

read.table("foo.txt", header = TRUE, sep = "/", stringsAsFactors = FALSE)

readxl - read_excel("foo.xlsx", sheet=bar);
lapply(excel_sheets("foo.xlsx"), read_excel, path = "foo.xlsx")

XLConnect - loadWorkbook(), getSheets(), readWorksheet() & a lots more

read SQL - DBI, dbListTables, dbReadTable, dbGetQuery(efficient!)

read JSON - jsonlite: fromJSON()

read stats. software - haven, foreign

packages: readr - similar to utils but simpler; data.table::fread - fast, convenient

