Apply functions with purrr : : **CHEAT SHEET**

Map Functions

ONE LIST

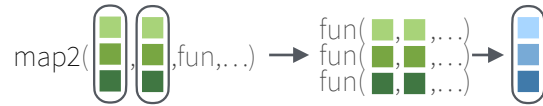**map(**.x, .f, …**)** Apply a function to each element of a list or vector, return a list.
```
x <- list(1:10, 11:20, 21:30)
l1 <- list(x = c("a", "b"), y = c("c", "d"))
map(l1, sort, decreasing = TRUE)
```


map_dbl(.x, .f, …**)**
Return a double vector.
map_dbl(x, mean)
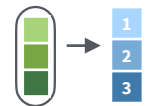
map_int(.x, .f, …**)**
Return an integer vector.
map_int(x, length)
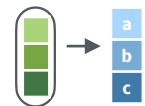
map_chr(.x, .f, …**)**
Return a character vector.
map_chr(l1, paste, collapse = "")

map_lgl(.x, .f, …**)**
Return a logical vector.
map_lgl(x, is.integer)
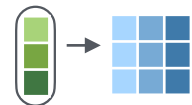
map_dfc(.x, .f, …**)**
Return a data frame created by column-binding.
map_dfc(l1, rep, 3)

map_dfr(.x, .f, …, .id = NULL**)**
Return a data frame created by row-binding.
map_dfr(x, summary)

walk(.x, .f, …**)** Trigger side effects, return invisibly.
walk(x, print)

TWO LISTS

map2(.x, .y, .f, …**)** Apply a function to pairs of elements from two lists or vectors, return a list.
```
y <- list(1, 2, 3); z <- list(4, 5, 6); l2 <- list(x = "a", y = "z")
map2(x, y, ~ .x * .y)
```


map2_dbl(.x, .y, .f, …**)**
Return a double vector.
map2_dbl(y, z, ~ .x / .y)

map2_int(.x, .y, .f, …**)**
Return an integer vector.
map2_int(y, z, `+`)

map2_chr(.x, .y, .f, …**)**
Return a character vector.
map2_chr(l1, l2, paste, collapse = ",", sep = ":")

map2_lgl(.x, .y, .f, …**)**
Return a logical vector.
map2_lgl(l2, l1, `%in%`)

map2_dfc(.x, .y, .f, …**)**
Return a data frame created by column-binding.
map2_dfc(l1, l2, ~ as.data.frame(c(.x, .y)))

map2_dfr(.x, .y, .f, …, .id = NULL**)** Return a data frame created by row-binding.
map2_dfr(l1, l2, ~ as.data.frame(c(.x, .y)))

walk2(.x, .y, .f, …**)** Trigger side effects, return invisibly.
walk2(objs, paths, save)

MANY LISTS

pmap(.l, .f, …**)** Apply a function to groups of elements from a list of lists or vectors, return a list.
pmap(list(x, y, z), ~ ..1 * (..2 + ..3))
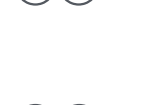

pmap_dbl(.l, .f, …**)**
Return a double vector.
pmap_dbl(list(y, z), ~ .x / .y)

pmap_int(.l, .f, …**)**
Return an integer vector.
pmap_int(list(y, z), `+`)

pmap_chr(.l, .f, …**)**
Return a character vector.
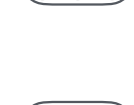pmap_chr(list(l1, l2), paste, collapse = ",", sep = ":")

pmap_lgl(.l, .f, …**)**
Return a logical vector.
pmap_lgl(list(l2, l1), `%in%`)

pmap_dfc(.l, .f, …**)** Return a data frame created by column-binding.
pmap_dfc(list(l1, l2), ~ as.data.frame(c(.x, .y)))

pmap_dfr(.l, .f, …, .id = NULL**)** Return a data frame created by row-binding.
pmap_dfr(list(l1, l2), ~ as.data.frame(c(.x, .y)))

pwalk(.l, .f, …**)** Trigger side effects, return invisibly.
pwalk(list(objs, paths), save)

LISTS AND INDEXES

imap(.x, .f, …**)** Apply .f to each element and its index, return a list.
imap(y, ~ paste0(.y, ": ", .x))

imap_dbl(.x, .f, …**)**
Return a double vector.
imap_dbl(y, ~ .y)

imap_int(.x, .f, …**)**
Return an integer vector.
imap_int(y, ~ .y)

imap_chr(.x, .f, …**)**
Return a character vector.
imap_chr(y, ~ paste0(.y, ": ", .x))

imap_lgl(.x, .f, …**)**
Return a logical vector.
imap_lgl(l1, ~ is.character(.y))

imap_dfc(.x, .f, …**)**
Return a data frame created by column-binding.
imap_dfc(l2, ~ as.data.frame(c(.x, .y)))

imap_dfr(.x, .f, …, .id = NULL**)**
Return a data frame created by row-binding.
imap_dfr(l2, ~ as.data.frame(c(.x, .y)))

iwalk(.x, .f, …**)** Trigger side effects, return invisibly.
iwalk(z, ~ print(paste0(.y, ": ", .x)))

Function Shortcuts

Use **~ .** with functions like **map()** that have single arguments.

map(l, ~ . + 2)
becomes
map(l, function(x) x + 2))

Use **~ .x .y** with functions like **map2()** that have two arguments.

map2(l, p, ~ .x +.y)
becomes
map2(l, p, function(l, p) l + p)

Use **~ ..1 ..2 ..3** etc with functions like **pmap()** that have many arguments.

pmap(list(a, b, c), ~ ..3 + ..1 - ..2)
becomes
pmap(list(a, b, c), function(a, b, c) c + a -b)

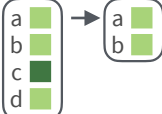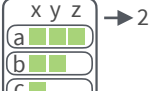Use **~ .x .y** with functions like **imap()**. .x will get the list value and .y will get the index.

imap(list(a, b, c), ~ paste0(.y, ": ", .x)
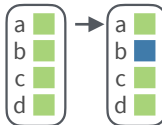outputs **"index: value"** for each item

Use a **string** or an **integer** with any map function to index list elements by name or position. **map(l, "name")** becomes **map(l, function(x) x[["name"]])**
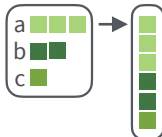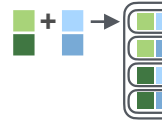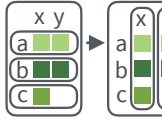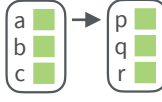
Work with Lists

purrr

Filter

keep(.x, .p, …**)** Select elements that pass a logical test. Conversely, **discard()**.
keep(x, is.na)

compact(.x, .p = identity**)** Drop empty elements.
compact(x)

head_while(.x, .p, …**)** Return head elements until one does not pass. Also **tail_while()**.
head_while(x, is.character)

detect(.x, .f, …, dir = c("forward", "backward"), .right = NULL, .default = NULL**)** Find first element to pass.
detect(x, is.character)

detect_index(.x, .f, …, dir = c("forward", "backward"), .right = NULL**)** Find index of first element to pass.
detect_index(x, is.character)

every(.x, .p, …**)** Do all elements pass a test?
every(x, is.character)

some(.x, .p, …**)** Do some elements pass a test?
some(x, is.character)

none(.x, .p, …**)** Do no elements pass a test?
none(x, is.character)

has_element(.x, .y**)** Does a list contain an element?
has_element(x, "foo")

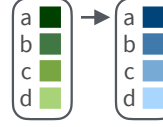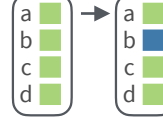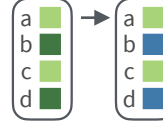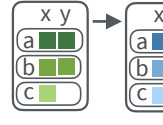**vec_depth(**x**)** Return depth (number of levels of indexes).
vec_depth(x)

Index

pluck(.x, …, .default=NULL**)** Select an element by name or index. Also **attr_getter()** and **chuck()**.
pluck(x, "b")
x %>% pluck("b")

assign_in(x, where, value**)** Assign a value to a location using pluck selection.
assign_in(x, "b", 5)
x %>% assign_in("b", 5)

modify_in(.x, .where, .f**)** Apply a function to a value at a selected location.
modify_in(x, "b", abs)
x %>% modify_in("b", abs)

Reshape

flatten(.x**)** Remove a level of indexes from a list. Also **flatten_chr()** etc.
flatten(x)

array_tree(array, margin = NULL**)** Turn array into list. Also **array_branch()**.
array_tree(x, margin = 3)

cross2(.x, .y, .filter = NULL**)** All combinations of .x and .y. Also **cross()**, **cross3()**, and **cross_df()**.
cross2(1:3, 4:6)

transpose(.l, .names = NULL**)** Transposes the index order in a multi-level list.
transpose(x)

set_names(x, nm = x**)** Set the names of a vector/list directly or with a function.
set_names(x, c("p", "q", "r"))
set_names(x, tolower)

Modify

modify(.x, .f, …**)** Apply a function to each element. Also **modify2()**, and **imodify()**.
modify(x, ~.+ 2)

modify_at(.x, .at, .f, …**)** Apply a function to selected elements. Also **map_at()**.
modify_at(x, "b", ~.+ 2)

modify_if(.x, .p, .f, …**)** Apply a function to elements that pass a test. Also **map_if()**.
modify_if(x, is.numeric,~.+2)

modify_depth(.x, .depth, .f, …**)** Apply function to each element at a given level of a list. Also **map_depth()**.
modify_depth(x, 2, ~.+ 2)

Combine

append(x, values, after = length(x)**)** Add values to end of list.
append(x, list(d = 1))

prepend(x, values, before = 1**)** Add values to start of list.
prepend(x, list(d = 1))

splice(…**)** Combine objects into a list, storing S3 objects as sub-lists.
splice(x, y, "foo")

Reduce

reduce(.x, .f, …, .init, .dir = c("forward", "backward")**)** Apply function recursively to each element of a list or vector. Also **reduce2()**.
reduce(x, sum)

func + ⟶ func( ) ⟶ func( ) ⟶ func( ) ⟶

List-Columns

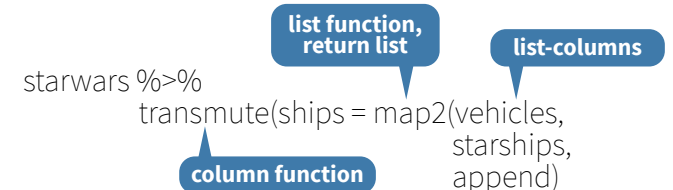| max	seq
3	<int [3]>
4	<int [4]>
5	<int [5]>
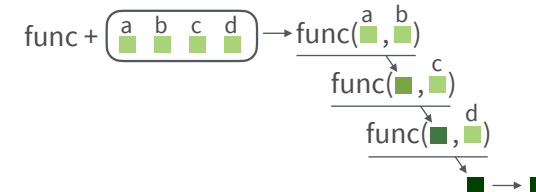
List-columns are columns of a data frame where each element is a list or vector instead of an atomic value. Columns can also be lists of data frames. See **tidyr** for more about nested data and list columns.
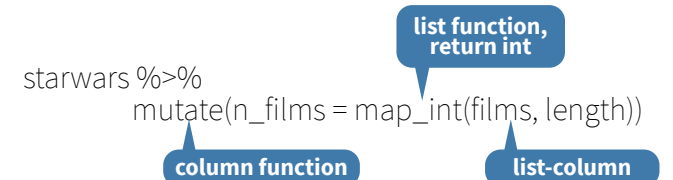
WORK WITH LIST-COLUMNS

Manipulate list-columns like any other kind of column, using **dplyr** functions like **mutate()** and **transmute()**. Because each element is a list, use **map functions** within a column function to manipulate each element.

map(), **map2()**, or **pmap()** return lists and will **create new list-columns**.

starwars %>%
  transmute(ships = map2(vehicles,
     starships,
     append)

list function, return list *list-columns* *column function*

Suffixed map functions like **map_int()** return an atomic data type and will **simplify list-columns into regular columns**.

starwars %>%
  mutate(n_films = map_int(films, length))

list function, return int *column function* *list-column*

accumulate(.x, .f, …, .init**)** Reduce a list, but also return intermediate results. Also **accumulate2()**.
accumulate(x, sum)

func + ⟶ func( ) ⟶ func( ) ⟶ func( ) ⟶