

R Notebook

1

If the data type of all the atoms is same, we call it atom vectors.

2

```
library(tidyverse)

## Warning: package 'tidyverse' was built under R version 4.1.1

## -- Attaching packages ----- tidyverse 1.3.1 --

## v ggplot2 3.3.5    v purrr  0.3.4
## v tibble  3.1.2    v dplyr  1.0.6
## v tidyr   1.1.4    v stringr 1.4.0
## v readr   2.1.1    v forcats 0.5.1

## Warning: package 'ggplot2' was built under R version 4.1.1

## Warning: package 'tidyr' was built under R version 4.1.2

## Warning: package 'readr' was built under R version 4.1.2

## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()

V <- c("Bears", "Lions", "Dolphins", "Eagles", "Bengals")
V[3]

## [1] "Dolphins"
```

3

```
V[c(1,3,5)]

## [1] "Bears" "Dolphins" "Bengals"
```

4

```
V[c(2,3,4,5)]

## [1] "Lions" "Dolphins" "Eagles" "Bengals"

V[-1]

## [1] "Lions" "Dolphins" "Eagles" "Bengals"
```

5

Due to different data type entries, it's called list.

6

```
K <- list(x = 3:7, "never", 43, y = list(10,20,30))
length(K)

## [1] 4
```

7

```
V[4]

## [1] "Eagles"
```

8

```
V[]

## [1] "Bears" "Lions" "Dolphins" "Eagles" "Bengals"
```

9

```
tribble(~x, ~y, ~w, ~z,
  210, 300, 220, 180,
  102, 100, 119, 187,
  176, 175, 188, 173,
  87, 95, 91, 94,
  202, 210, 234, 218,
  110, 122, 131, 128,
) -> dt
# a

map_dbl(dt, mean)

##      x      y      w      z
## 147.8333 167.0000 163.8333 163.3333

# b
map_dbl(dt, sd)

##      x      y      w      z
## 54.45151 79.12016 58.40348 44.66617

# c
dt%>%map(sqrt)

## $x
## [1] 14.491377 10.099505 13.266499 9.327379 14.212670 10.488088
##
## $y
## [1] 17.320508 10.000000 13.228757 9.746794 14.491377 11.045361
##
## $w
```

```
## [1] 14.832397 10.908712 13.711309 9.539392 15.297059 11.445523
##
## $z
## [1] 13.41641 13.67479 13.15295 9.69536 14.76482 11.31371
```

#d

```
summary(dt)
```

```
##      x          y          w          z
## Min.   :87.0   Min.   :95.0   Min.   :91.0   Min.   :94.0
## 1st Qu.:104.0  1st Qu.:105.5  1st Qu.:122.0  1st Qu.:139.2
## Median :143.0  Median :148.5  Median :159.5  Median :176.5
## Mean   :147.8  Mean   :167.0  Mean   :163.8  Mean   :163.3
## 3rd Qu.:195.5  3rd Qu.:201.2  3rd Qu.:212.0  3rd Qu.:185.2
## Max.   :210.0  Max.   :300.0  Max.   :234.0  Max.   :218.0
```

```
dt%>%map(summary)
```

```
## $x
##   Min. 1st Qu. Median   Mean 3rd Qu.   Max.
##   87.0  104.0  143.0  147.8  195.5  210.0
##
## $y
##   Min. 1st Qu. Median   Mean 3rd Qu.   Max.
##   95.0  105.5  148.5  167.0  201.2  300.0
##
## $w
##   Min. 1st Qu. Median   Mean 3rd Qu.   Max.
##   91.0  122.0  159.5  163.8  212.0  234.0
##
## $z
##   Min. 1st Qu. Median   Mean 3rd Qu.   Max.
##   94.0  139.2  176.5  163.3  185.2  218.0
```

10

```
x <- list(26, 32, 45, 50, 65, 77, 82)
y <- list(30, 43, 50, 58, 62, 71, 88)
```

```
unlist(x)+unlist(y)
```

```
## [1] 56 75 95 108 127 148 170
```

```
Map("+", x, y)
```

```
## [[1]]
## [1] 56
##
## [[2]]
## [1] 75
##
## [[3]]
## [1] 95
```

```
##
## [[4]]
## [1] 108
##
## [[5]]
## [1] 127
##
## [[6]]
## [1] 148
##
## [[7]]
## [1] 170

sqr x = Map('*',x,x)
sqr y = Map('*',y,y)
Map("-",sqr x,sqr y)

## [[1]]
## [1] -224
##
## [[2]]
## [1] -825
##
## [[3]]
## [1] -475
##
## [[4]]
## [1] -864
##
## [[5]]
## [1] 381
##
## [[6]]
## [1] 888
##
## [[7]]
## [1] -1020

ln x = Map("log",x)
ln y = Map("log",y)
Map("/",ln x,ln y)

## [[1]]
## [1] 0.9579263
##
## [[2]]
## [1] 0.9214442
##
## [[3]]
## [1] 0.9730675
##
## [[4]]
```

```
## [1] 0.9634473
##
## [[5]]
## [1] 1.011449
##
## [[6]]
## [1] 1.019032
##
## [[7]]
## [1] 0.9842278
```