Lists

R Data Objects

Gaston Sanchez

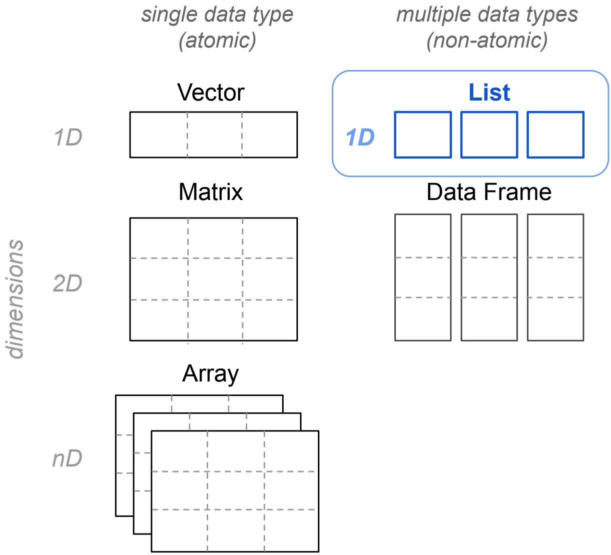
R Coding Compendium

Donate

About

- Lists

Basic Data Objects in R



R lists

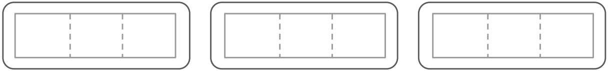
- A list is the most general data structure in R
- An R list is a generic vector
- Lists can contain any other type of data structure
- Lists can even contain other lists

Example

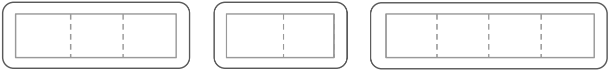
```r
# list of vectors (of equal length)
lis1 <- list(
  1:3,
  c(TRUE, FALSE, TRUE),
  c("a", "b", "c")
)

# list of vectors (of different length)
lis2 <- list(
  1:3,
  c(TRUE, FALSE),
  c("a", "b", "c", "d")
)
```

List of Vectors (of equal length)



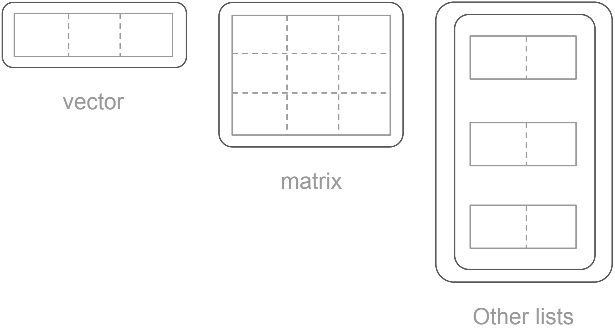
List of Vectors (of different length)



Example

```r
# list of various objects
lis3 <- list(
  1:3,
  matrix(1:9, nrow = 3, ncol = 3),
  list(1:2, c(FALSE, TRUE), c("a", "b"))
)
```

List of various objects



vector

matrix

Other lists

R lists

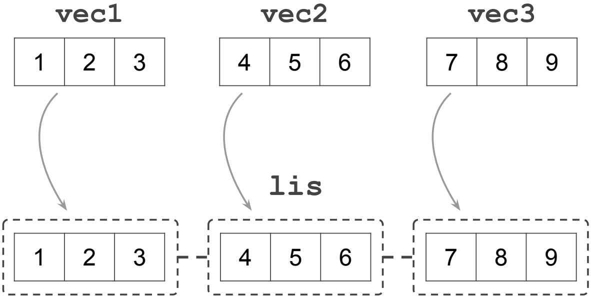
- Lists are a special type of vector

```
lst <- vector(mode = "list")
```

- Lists are vectors in the sense of being a one-dimensional object
- Lists are NOT atomic structures

Example: list of unnamed elements

vectors of equal length



list with three elements (3 vectors of equal length)

Example: list of unnamed elements

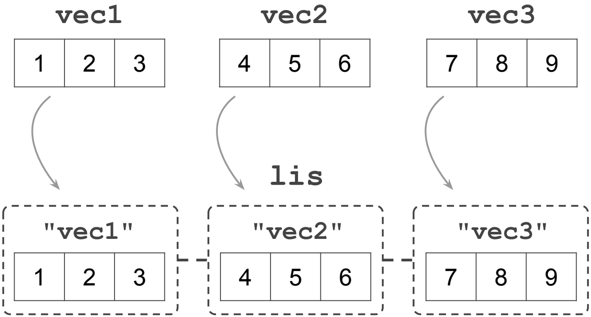
```r
vec1 = 1:3
vec2 = 4:6
vec3 = 7:9

lis <- list(vec1, vec2, vec3)
lis
```

```
## [[1]]
## [1] 1 2 3
##
## [[2]]
## [1] 4 5 6
##
## [[3]]
## [1] 7 8 9
```

Example: list of named elements

vectors of equal length



list with named elements

Example: list of named elements

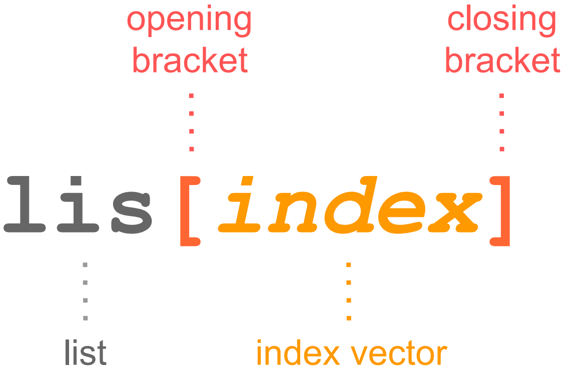
```r
vec1 = 1:3
vec2 = 4:6
vec3 = 7:9

# list with named elements (highly recommendable)
lis <- list("vec1" = vec1, "vec2" = vec2, "vec3" = vec3)
lis
```

```
## $vec1
## [1] 1 2 3
##
## $vec2
## [1] 4 5 6
##
## $vec3
## [1] 7 8 9
```

Subsetting and Indexing

Single Brackets



opening bracket

closing bracket

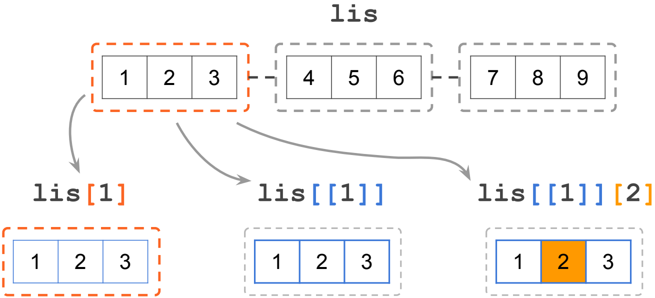
`lis[index]`

list

index vector

Bracket Notation System

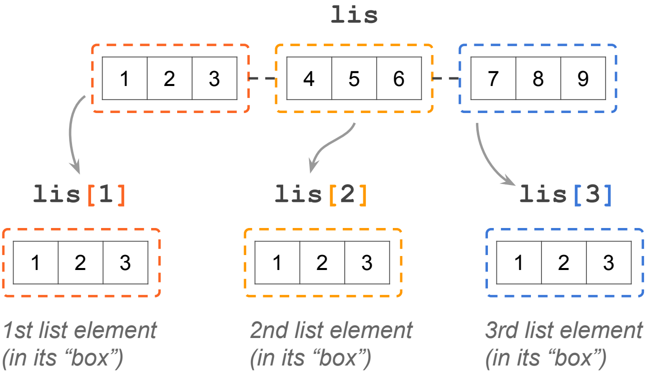
- To extract values from R objects use brackets: `[ ]`
- Inside the brackets specify vector(s) of indices
- Use as many indices, separated by commas, as dimensions in the object
- Vector(s) of indices can be numbers, logicals, and sometimes names



1st list element (in its “box”)

“unboxed” 1st list element

2nd element, of 1st list element



`lis`

1 2 3 4 5 6 7 8 9

`lis[1]`

1 2 3

1st list element (in its “box”)

`lis[2]`

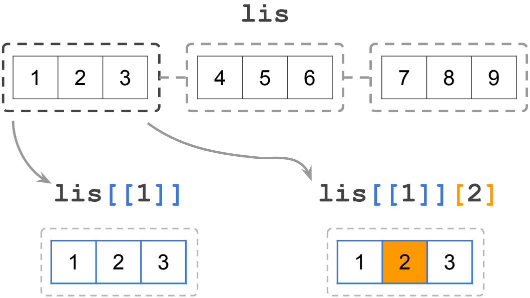
1 2 3

2nd list element (in its “box”)

`lis[3]`

1 2 3

3rd list element (in its “box”)



`lis`

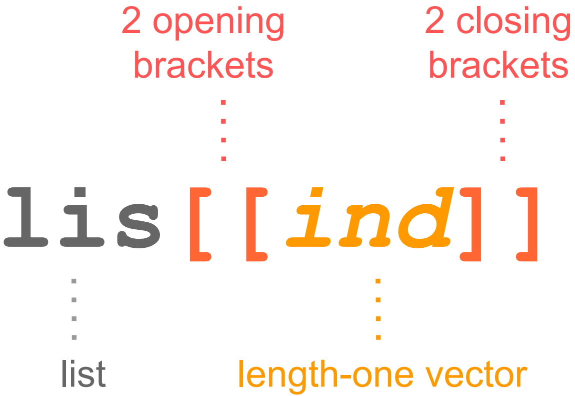
`lis[[1]]`

`lis[[1]][2]`

“unboxed” 1st list element

2nd element, of 1st list element

Double Brackets



2 opening brackets

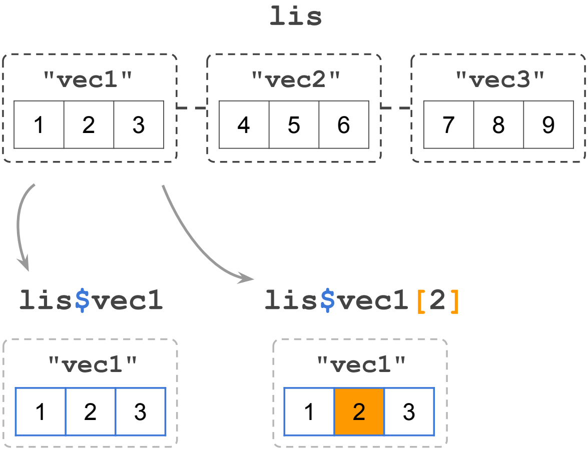
2 closing brackets

`lis[[ind]]`

list

length-one vector

Dollar Operator



`lis`

"vec1" 1 2 3

"vec2" 4 5 6

"vec3" 7 8 9

`lis$vec1`

"vec1" 1 2 3

`lis$vec1[2]`

"vec1" 1 2 3

"unboxed"
***vec1** object*

2nd element of
***vec1** object*

Donation

If you find any value and usefulness in this set of slides, please consider making a one-time donation in any amount (via paypal). Your support really matters.

Donate

https://www.paypal.com/donate?business=ZF6U7K5MW25W2&currency_code=USD