R_List

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Introduction

Lists are the R objects which contain elements of different types like − numbers, strings, vectors, matrix and another list inside it.

Syntax: list(...)

Creating List (Direct Approach)

```
list_data<- list(c(1,2),c("A","B"))
print(list_data)
```

```
## [[1]]
## [1] 1 2
##
## [[2]]
## [1] "A" "B"
```

```
list_a <- list(1:3,5,c(0.5,-0.8),12.5, c("A","B"), "C", c(TRUE,FALSE,T,F),FALSE)
print(list_a)
```

```
## [[1]]
## [1] 1 2 3
##
## [[2]]
## [1] 5
##
## [[3]]
## [1]  0.5 -0.8
##
## [[4]]
## [1] 12.5
##
## [[5]]
## [1] "A" "B"
##
## [[6]]
## [1] "C"
##
## [[7]]
## [1]  TRUE FALSE  TRUE FALSE
```

```
##
## [[8]]
## [1] FALSE
```

Creating List (Indirect Approach)

```
a=c(1,2)
b=c("A","B")
list_data<- list(a,b)
print(list_data)
```

```
## [[1]]
## [1] 1 2
##
## [[2]]
## [1] "A" "B"
```

```
v_int <- c(99:101)
v_num1 <- 4
v_num2 <- c(-1.1,3.4)
v_num3 <- -46.5
v_char1 <-c("W","X")
v_char2 <-"Y"
v_bol1 <-c(F,T)
v_bol2 <-FALSE


list_b <- list(v_int,v_num1,v_num2,v_num3,v_char1,v_char2,v_bol1,v_bol2)

print(list_b)
```

```
## [[1]]
## [1]  99 100 101
##
## [[2]]
## [1] 4
##
## [[3]]
## [1] -1.1  3.4
##
## [[4]]
## [1] -46.5
##
## [[5]]
## [1] "W" "X"
##
## [[6]]
## [1] "Y"
##
## [[7]]
## [1] FALSE  TRUE
```

```
##
## [[8]]
## [1] FALSE
```

Creating List Containing List

```
v_int <- c(99:101)
v_num1 <- 4
v_num2 <- c(-1.1,3.4)
v_num3 <- -46.5

list_c <- list(v_int,v_num1,v_num2,v_num3)

v_char1 <- c("W","X")
v_char2 <- "Y"
v_bol1 <- c(F,T)
v_bol2 <- FALSE

list_with_list <- list(list_c,v_char1,v_char2,v_bol1,v_bol2)

print(list_with_list)
```

```
## [[1]]
## [[1]][[1]]
## [1]  99 100 101
##
## [[1]][[2]]
## [1] 4
##
## [[1]][[3]]
## [1] -1.1  3.4
##
## [[1]][[4]]
## [1] -46.5
##
##
## [[2]]
## [1] "W" "X"
##
## [[3]]
## [1] "Y"
##
## [[4]]
## [1] FALSE  TRUE
##
## [[5]]
## [1] FALSE
```

Naming List Element

```
list_naming <- list(Int=1:3,Chars = c("a","B"))
print(list_naming)
```

1.Direct Method

```
## $Int
## [1] 1 2 3
##
## $Chars
## [1] "a" "B"
```

```
list_naming[1]
```

```
## $Int
## [1] 1 2 3
```

```
list_naming["Chars"]
```

```
## $Chars
## [1] "a" "B"
```

```
v_int <- c(99:101)
v_char <- c("A","B")
mat_a <- matrix(1:9,3)
list_a <- list(1:3,letters[1:5])

list_data <- list(v_int,v_char,mat_a,list_a)
names(list_data) <- c("Int", "Char","Matrix","Inner List")
print(list_data)
```

2.Indirect Method

```
## $Int
## [1]  99 100 101
##
## $Char
## [1] "A" "B"
##
## $Matrix
##      [,1] [,2] [,3]
## [1,]    1    4    7
## [2,]    2    5    8
## [3,]    3    6    9
##
## $`Inner List`
## $`Inner List`[[1]]
## [1] 1 2 3
##
## $`Inner List`[[2]]
## [1] "a" "b" "c" "d" "e"
```

Accessing List Elements

```
# Create List
v_int <- c(99:101)
v_char <- c("A","B")
mat_a <- matrix(1:9,3)
list_a <- list(1:3,letters[1:5])
list_data <- list(v_int,v_char,mat_a,list_a)
print(list_data)
```

```
## [[1]]
## [1]  99 100 101
##
## [[2]]
## [1] "A" "B"
##
## [[3]]
##      [,1] [,2] [,3]
## [1,]    1    4    7
## [2,]    2    5    8
## [3,]    3    6    9
##
## [[4]]
## [[4]][[1]]
## [1] 1 2 3
##
## [[4]][[2]]
## [1] "a" "b" "c" "d" "e"
```

```
# Access the 1st element of the list
print(list_data[1])
```

```
## [[1]]
## [1]  99 100 101
```

```
# Access the data at 2nd element of the list
print(list_data[[2]])
```

```
## [1] "A" "B"
```

```
# Access the data at 1st position of 2nd element in the list
print(list_data[[2]][1])
```

```
## [1] "A"
```

```
# Access the data from Inner list
print(list_data[[4]][2])
```

```
## [[1]]
## [1] "a" "b" "c" "d" "e"
```

```
print(list_data[[4]][[2]])
```

```
## [1] "a" "b" "c" "d" "e"
```

```
print(list_data[[4]][[2]][5])
```

```
## [1] "e"
```

Accessing List Elements using Names

```
# Create List
v_int <- c(99:101)
v_char <- c("A","B")
mat_a <- matrix(1:9,3)
list_a <-list("InnerInt"=1:3,"InnerChar"=letters[1:5])
list_data <- list(v_int,v_char,mat_a,list_a)

# Adding Names to List
names(list_data) <- c("Int", "Char","Matrix","InnerList")
print(list_data)
```

```
## $Int
## [1]  99 100 101
##
## $Char
## [1] "A" "B"
##
## $Matrix
##      [,1] [,2] [,3]
## [1,]    1    4    7
## [2,]    2    5    8
## [3,]    3    6    9
##
## $InnerList
## $InnerList$InnerInt
## [1] 1 2 3
##
## $InnerList$InnerChar
## [1] "a" "b" "c" "d" "e"
```

```
# Access "Matrix" from the list
print(list_data[[3]])
```

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

```r
print(list_data$Matrix)
```

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

```r
print(list_data[["Matrix"]])
```

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

```r
# Access the data at 2nd element of the list
print(list_data[[2]])
```

```
## [1] "A" "B"
```

```r
print(list_data$Char)
```

```
## [1] "A" "B"
```

```r
# Access the data at 1st position of 2nd element in the list
print(list_data[[2]][1])
```

```
## [1] "A"
```

```r
print(list_data$Char[1])
```

```
## [1] "A"
```

```r
# Access the data from Inner list
print(list_data[[4]][2])
```

```
## $InnerChar
## [1] "a" "b" "c" "d" "e"
```

```r
print(list_data$InnerList$InnerChar)
```

```
## [1] "a" "b" "c" "d" "e"
```

```r
print(list_data[[4]][[2]])
```

```
## [1] "a" "b" "c" "d" "e"
```

```r
print(list_data[[4]][[2]][5])
```

```
## [1] "e"
```

```r
print(list_data$InnerList$InnerChar[5])
```

```
## [1] "e"
```

Manipulating List Elements

```r
# Create List
v_int <- c(99:101)
v_char <- c("A","B")
mat_a <- matrix(1:9,3)
list_a <-list("InnerInt"=1:3,"InnerChar"=letters[1:5])
list_data <- list(v_int,v_char,mat_a,list_a)

# Adding Names to List
names(list_data) <- c("Int", "Char","Matrix","InnerList")
print(list_data)
```

```
## $Int
## [1]  99 100 101
##
## $Char
## [1] "A" "B"
##
## $Matrix
##      [,1] [,2] [,3]
## [1,]    1    4    7
## [2,]    2    5    8
## [3,]    3    6    9
##
## $InnerList
## $InnerList$InnerInt
## [1] 1 2 3
##
## $InnerList$InnerChar
## [1] "a" "b" "c" "d" "e"
```

```r
# Manipulate "Matrix" from the list
print(list_data[["Matrix"]])
```

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

```
list_data[[3]] <- matrix(LETTERS[1:9],3,3)

print(list_data$Matrix)
```

```
##      [,1] [,2] [,3]
## [1,] "A"  "D"  "G"
## [2,] "B"  "E"  "H"
## [3,] "C"  "F"  "I"
```

```
# Manipulate the data at 2nd element of the list
print(list_data[["Char"]])
```

```
## [1] "A" "B"
```

```
list_data[[2]] <- c("IJK","XYZ")

print(list_data$Char)
```

```
## [1] "IJK" "XYZ"
```

```
# Manipulate the data at 1st position of 2nd element in the list
print(list_data[[2]][1])
```

```
## [1] "IJK"
```

```
list_data$Char[1] <-"PQR"

print(list_data[[2]])
```

```
## [1] "PQR" "XYZ"
```

```
# I. Manipulate the data from Inner list

print(list_data$InnerList$InnerChar)
```

```
## [1] "a" "b" "c" "d" "e"
```

```
list_data[[4]][[2]] <- rnorm(length(list_data$InnerList$InnerChar))

print(list_data$InnerList$InnerChar)
```

```
## [1]  1.11646470 -1.48031196  1.32213351  1.54249027  0.04784453
```

```
# II. Manipulate the data from Inner list

print(list_data[[4]][[2]][5])
```

```
## [1] 0.04784453
```

```
list_data$InnerList$InnerChar[5] <- 99999

print(list_data[[4]][[2]])
```

```
## [1]     1.116465    -1.480312     1.322134     1.542490 99999.000000
```

Merge List Elements

```
# Create two lists
l1 <- list(10,20,30)
l1
```

```
## [[1]]
## [1] 10
##
## [[2]]
## [1] 20
##
## [[3]]
## [1] 30
```

```
l2 <- list("A","B","C")
l2
```

```
## [[1]]
## [1] "A"
##
## [[2]]
## [1] "B"
##
## [[3]]
## [1] "C"
```

```
# Merge list
l3 <- c(l1,l2)
print(l3)
```

```
## [[1]]
## [1] 10
##
## [[2]]
## [1] 20
##
## [[3]]
## [1] 30
##
## [[4]]
## [1] "A"
##
## [[5]]
```

```
## [1] "B"
##
## [[6]]
## [1] "C"
```

Converting List into Vector

```
# Create list 1
l1 <- list(10,20,30)
l1
```

```
## [[1]]
## [1] 10
##
## [[2]]
## [1] 20
##
## [[3]]
## [1] 30
```

```
class(l1)
```

```
## [1] "list"
```

```
# Create list 2
l2 <- list("A","B","C")
l2
```

```
## [[1]]
## [1] "A"
##
## [[2]]
## [1] "B"
##
## [[3]]
## [1] "C"
```

```
class(l2)
```

```
## [1] "list"
```

```
# Unlist list 1
v1 <- unlist(l1)
print(v1)
```

```
## [1] 10 20 30
```

```r
class(v1)
```

```
## [1] "numeric"
```

```r
# Unlist list 2
v2 <- unlist(l2)
print(v2)
```

```
## [1] "A" "B" "C"
```

```r
class(v2)
```

```
## [1] "character"
```