Matrices, Arrays and Lists

Dhruv Aggarwal

12/5/2020

#Matrices  
A = matrix(1:10, nrow=5)  
rownames(A)=c("1st","2nd","3rd","4th","5th")  
A

## [,1] [,2]  
## 1st 1 6  
## 2nd 2 7  
## 3rd 3 8  
## 4th 4 9  
## 5th 5 10

colnames(A)=c("col-1","col-2")  
A

## col-1 col-2  
## 1st 1 6  
## 2nd 2 7  
## 3rd 3 8  
## 4th 4 9  
## 5th 5 10

#Arrays  
theArray= array(1:12,dim=c(2,3,2))  
theArray

## , , 1  
##   
## [,1] [,2] [,3]  
## [1,] 1 3 5  
## [2,] 2 4 6  
##   
## , , 2  
##   
## [,1] [,2] [,3]  
## [1,] 7 9 11  
## [2,] 8 10 12

#\_,\_,1 First blank is row, then column then dimension  
theArray1= array(1:12,dim=c(2,3,3))  
theArray1 # Repeat values after ends for the dimensions

## , , 1  
##   
## [,1] [,2] [,3]  
## [1,] 1 3 5  
## [2,] 2 4 6  
##   
## , , 2  
##   
## [,1] [,2] [,3]  
## [1,] 7 9 11  
## [2,] 8 10 12  
##   
## , , 3  
##   
## [,1] [,2] [,3]  
## [1,] 1 3 5  
## [2,] 2 4 6

theArray[1,,]

## [,1] [,2]  
## [1,] 1 7  
## [2,] 3 9  
## [3,] 5 11

dim(theArray[1,,])

## [1] 3 2

theArray[,1,]

## [,1] [,2]  
## [1,] 1 7  
## [2,] 2 8

dim(theArray[,1,])

## [1] 2 2

theArray[,,1]

## [,1] [,2] [,3]  
## [1,] 1 3 5  
## [2,] 2 4 6

dim(theArray[,,1])

## [1] 2 3

#Lists  
list(1,2,3)

## [[1]]  
## [1] 1  
##   
## [[2]]  
## [1] 2  
##   
## [[3]]  
## [1] 3

list

## function (...) .Primitive("list")

list1=list(c(1,2,3),4:10) #2 elements in the list  
list1

## [[1]]  
## [1] 1 2 3  
##   
## [[2]]  
## [1] 4 5 6 7 8 9 10

x = 10:1  
y = -4:5  
q = c("Hockey","Football","Baseball","Curlin","Rugby","Lacrosse",  
 "Basketball","Tennis","Cricket","Soccer")  
theDF = data.frame(x,y,q) # this would create a 10x3 data.frame with x, y and q as variable names  
theDF

## x y q  
## 1 10 -4 Hockey  
## 2 9 -3 Football  
## 3 8 -2 Baseball  
## 4 7 -1 Curlin  
## 5 6 0 Rugby  
## 6 5 1 Lacrosse  
## 7 4 2 Basketball  
## 8 3 3 Tennis  
## 9 2 4 Cricket  
## 10 1 5 Soccer

list2=list(theDF,1:10,list1)  
list2

## [[1]]  
## x y q  
## 1 10 -4 Hockey  
## 2 9 -3 Football  
## 3 8 -2 Baseball  
## 4 7 -1 Curlin  
## 5 6 0 Rugby  
## 6 5 1 Lacrosse  
## 7 4 2 Basketball  
## 8 3 3 Tennis  
## 9 2 4 Cricket  
## 10 1 5 Soccer  
##   
## [[2]]  
## [1] 1 2 3 4 5 6 7 8 9 10  
##   
## [[3]]  
## [[3]][[1]]  
## [1] 1 2 3  
##   
## [[3]][[2]]  
## [1] 4 5 6 7 8 9 10

list2= list(DataFrame = theDF,Vector=1:10,List=list1)  
list2

## $DataFrame  
## x y q  
## 1 10 -4 Hockey  
## 2 9 -3 Football  
## 3 8 -2 Baseball  
## 4 7 -1 Curlin  
## 5 6 0 Rugby  
## 6 5 1 Lacrosse  
## 7 4 2 Basketball  
## 8 3 3 Tennis  
## 9 2 4 Cricket  
## 10 1 5 Soccer  
##   
## $Vector  
## [1] 1 2 3 4 5 6 7 8 9 10  
##   
## $List  
## $List[[1]]  
## [1] 1 2 3  
##   
## $List[[2]]  
## [1] 4 5 6 7 8 9 10