Group Manipulation

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- apply
- lapply
- sapply
- mapply

Apply Functions Over Array Margins

- Returns a vector or array or list of values obtained by applying a function to margins of an array or matrix.

apply(X, MARGIN, FUN, ...)

X	an array, including a matrix.
MARGIN	a vector giving the subscripts which the function will be applied over. E.g., for a matrix 1 indicates rows, 2 indicates columns, c(1, 2) indicates both rows and columns.
FUN	the function to be applied
...	

apply

- M<-matrix(1:9,nrow=4)
- apply(M,1,sum) # to get row sum
- apply(M,2,sum) # to get column sum

lapply

lapply returns a list of the same length as X, each element of which is the result of applying the FUN to the corresponding element of X.

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```
thelist<-list(A=matrix(1:9,3),B=1.4,matrix(1:9,2),D=21)
lapply(thelist,sum)
```

sapply

sapply is a user-friendly version and wrapper of lapply by default returning a vector or matrix

```
thelist<-list(A=matrix(1:9,3),B=1.4,matrix(1:9,2),D=21)
sapply(thelist,sum)
```

mapply

- mapply is a multivariate version of sapply.
- mapply applies FUN to the first elements of each argument, the second elements, the third elements, and so on

mapply

Eg :

```
f<-list(A=matrix(1:9,3),B=1.4,matrix(1:9,2),D=21)
s<-list(A=matrix(1:9,2),B=1.4,matrix(1:9,2),D=21)
mapply(identical,f,s)
```

Eg:2

```
mapply(rep, 1:4, 4:1)
```