Multivariante

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Datos multidimensionales

Ejemplo con tres dimensiones

```
ans = sample(c("Sí", "No"), size = 100, replace = T)
sex = sample(c("H", "M"), size = 100, replace = T)
place = sample(c("San Francisco", "Barcelona", "Valencia",
                 "Cobija", "Asturias"), size = 100, replace = T)
table(sex, ans, place)
```

```
## , , place = Asturias
##
##    ans
## sex No Sí
##   H 10  7
##   M  4  6
##
## , , place = Barcelona
##
##    ans
## sex No Sí
##   H  6  6
##   M  3  5
##
## , , place = Cobija
##
##    ans
## sex No Sí
##   H  2  2
##   M  5  4
##
## , , place = San Francisco
##
##    ans
## sex No Sí
##   H  4  7
##   M  7  5
##
## , , place = Valencia
##
##    ans
## sex No Sí
##   H  3  6
##   M  6  2
```

```
ftable(sex, ans, place)
```

```
##         place Asturias Barcelona Cobija San Francisco Valencia
## sex ans
## H   No              10         6      2             4        3
##     Sí               7         6      2             7        6
## M   No               4         3      5             7        6
##     Sí               6         5      4             5        2
```

```
ftable(sex, ans, place, col.vars = c("sex", "ans"))
```

```
##               sex  H     M
##               ans No Sí No Sí
## place
## Asturias          10  7  4  6
## Barcelona          6  6  3  5
## Cobija             2  2  5  4
## San Francisco      4  7  7  5
## Valencia           3  6  6  2
```

Filtrar las tablas

```
table(sex, ans, place)["M", "Sí", "San Francisco"]
```

```
## [1] 5
```

```
table(sex, ans, place)[ , "Sí", "Valencia"]
```

```
## H M
## 6 2
```

```
table(sex, ans, place)[ ,"No", ]
```

```
##    place
## sex Asturias Barcelona Cobija San Francisco Valencia
##   H       10         6      2             4        3
##   M        4         3      5             7        6
```

```
table(sex, ans, place)["M", , "Cobija"]
```

```
## No Sí
##  5  4
```

Frecuencias relativas

```
prop.table(table(sex, ans, place)) #Frec. Rel. Globales
```

```
## , , place = Asturias
##
##    ans
## sex   No   Sí
##   H 0.10 0.07
##   M 0.04 0.06
##
## , , place = Barcelona
##
##    ans
## sex   No   Sí
##   H 0.06 0.06
```

```
##   M 0.03 0.05
##
## , , place = Cobija
##
##    ans
## sex   No   Sí
##   H 0.02 0.02
##   M 0.05 0.04
##
## , , place = San Francisco
##
##    ans
## sex   No   Sí
##   H 0.04 0.07
##   M 0.07 0.05
##
## , , place = Valencia
##
##    ans
## sex   No   Sí
##   H 0.03 0.06
##   M 0.06 0.02
```

```
prop.table(table(sex, ans, place), margin = 3) #Frec. Rel. Marg. X Lugar
```

```
## , , place = Asturias
##
##    ans
## sex        No        Sí
##   H 0.3703704 0.2592593
##   M 0.1481481 0.2222222
##
## , , place = Barcelona
##
##    ans
## sex        No        Sí
##   H 0.3000000 0.3000000
##   M 0.1500000 0.2500000
##
## , , place = Cobija
##
##    ans
## sex        No        Sí
##   H 0.1538462 0.1538462
##   M 0.3846154 0.3076923
##
## , , place = San Francisco
##
##    ans
## sex        No        Sí
##   H 0.1739130 0.3043478
##   M 0.3043478 0.2173913
##
## , , place = Valencia
##
```

```
##    ans
## sex        No        Sí
##   H 0.1764706 0.3529412
##   M 0.3529412 0.1176471
```

```
prop.table(table(sex, ans, place), margin = c(1,3))
```

```
## , , place = Asturias
##
##    ans
## sex        No        Sí
##   H 0.5882353 0.4117647
##   M 0.4000000 0.6000000
##
## , , place = Barcelona
##
##    ans
## sex        No        Sí
##   H 0.5000000 0.5000000
##   M 0.3750000 0.6250000
##
## , , place = Cobija
##
##    ans
## sex        No        Sí
##   H 0.5000000 0.5000000
##   M 0.5555556 0.4444444
##
## , , place = San Francisco
##
##    ans
## sex        No        Sí
##   H 0.3636364 0.6363636
##   M 0.5833333 0.4166667
##
## , , place = Valencia
##
##    ans
## sex        No        Sí
##   H 0.3333333 0.6666667
##   M 0.7500000 0.2500000
```

```
#Frec. Rel. Marg. X Sexo y Lugar

ftable(prop.table(table(sex, ans, place)))
```

```
##         place Asturias Barcelona Cobija San Francisco Valencia
## sex ans
## H   No            0.10      0.06   0.02          0.04     0.03
##     Sí            0.07      0.06   0.02          0.07     0.06
## M   No            0.04      0.03   0.05          0.07     0.06
##     Sí            0.06      0.05   0.04          0.05     0.02
```

People (Hair-Eye-Color)

```
HairEyeColor
```

```
## , , Sex = Male
##
##        Eye
## Hair    Brown Blue Hazel Green
##   Black    32   11    10     3
##   Brown    53   50    25    15
##   Red      10   10     7     7
##   Blond     3   30     5     8
##
## , , Sex = Female
##
##        Eye
## Hair    Brown Blue Hazel Green
##   Black    36    9     5     2
##   Brown    66   34    29    14
##   Red      16    7     7     7
##   Blond     4   64     5     8
```

```
sum(HairEyeColor) -> total
```

El total de individuos de la taba de datos 592.

```
prop.table(HairEyeColor, margin = 3) #Frec. Rel. X Sexo
```

```
## , , Sex = Male
##
##        Eye
## Hair          Brown        Blue       Hazel       Green
##   Black 0.114695341 0.039426523 0.035842294 0.010752688
##   Brown 0.189964158 0.179211470 0.089605735 0.053763441
##   Red   0.035842294 0.035842294 0.025089606 0.025089606
##   Blond 0.010752688 0.107526882 0.017921147 0.028673835
##
## , , Sex = Female
##
##        Eye
## Hair          Brown        Blue       Hazel       Green
##   Black 0.115015974 0.028753994 0.015974441 0.006389776
##   Brown 0.210862620 0.108626198 0.092651757 0.044728435
##   Red   0.051118211 0.022364217 0.022364217 0.022364217
##   Blond 0.012779553 0.204472843 0.015974441 0.025559105
```

```
prop.table(HairEyeColor, margin = c(1,2)) #Frec. Rel. X Color Cabello y Ojos
```

```
## , , Sex = Male
##
##        Eye
## Hair        Brown      Blue     Hazel     Green
##   Black 0.4705882 0.5500000 0.6666667 0.6000000
##   Brown 0.4453782 0.5952381 0.4629630 0.5172414
##   Red   0.3846154 0.5882353 0.5000000 0.5000000
##   Blond 0.4285714 0.3191489 0.5000000 0.5000000
```

```
##
## , , Sex = Female
##
##        Eye
## Hair        Brown      Blue     Hazel     Green
##   Black 0.5294118 0.4500000 0.3333333 0.4000000
##   Brown 0.5546218 0.4047619 0.5370370 0.4827586
##   Red   0.6153846 0.4117647 0.5000000 0.5000000
##   Blond 0.5714286 0.6808511 0.5000000 0.5000000
```

```
aperm(HairEyeColor, perm = c("Sex", "Hair", "Eye"))
```

```
## , , Eye = Brown
##
##         Hair
## Sex      Black Brown Red Blond
##   Male      32    53  10     3
##   Female    36    66  16     4
##
## , , Eye = Blue
##
##         Hair
## Sex      Black Brown Red Blond
##   Male      11    50  10    30
##   Female     9    34   7    64
##
## , , Eye = Hazel
##
##         Hair
## Sex      Black Brown Red Blond
##   Male      10    25   7     5
##   Female     5    29   7     5
##
## , , Eye = Green
##
##         Hair
## Sex      Black Brown Red Blond
##   Male       3    15   7     8
##   Female     2    14   7     8
```

```
library(kableExtra)
```

```
## Warning: package 'kableExtra' was built under R version 3.6.1
```

```
kable(HairEyeColor)
```

Hair	Eye	Sex	Freq
Black	Brown	Male	32
Brown	Brown	Male	53
Red	Brown	Male	10
Blond	Brown	Male	3
Black	Blue	Male	11
Brown	Blue	Male	50
Red	Blue	Male	10
Blond	Blue	Male	30
Black	Hazel	Male	10
Brown	Hazel	Male	25
Red	Hazel	Male	7
Blond	Hazel	Male	5
Black	Green	Male	3
Brown	Green	Male	15
Red	Green	Male	7
Blond	Green	Male	8
Black	Brown	Female	36
Brown	Brown	Female	66
Red	Brown	Female	16
Blond	Brown	Female	4
Black	Blue	Female	9
Brown	Blue	Female	34
Red	Blue	Female	7
Blond	Blue	Female	64
Black	Hazel	Female	5
Brown	Hazel	Female	29
Red	Hazel	Female	7
Blond	Hazel	Female	5
Black	Green	Female	2
Brown	Green	Female	14
Red	Green	Female	7
Blond	Green	Female	8

```r
library(xtable)
```

```
## Warning: package 'xtable' was built under R version 3.6.1
```

```r
sex = factor(c("H", "M", "M", "M", "H", "H", "M", "M"))
answer = factor(c(sample(c("S", "N"), size = length(sex), replace = T)))
#Es necesario colocar en {r} el parámetro results = 'asis'
#Para que no se muestre el código en LaTeX sin procesar
#La función xtable solo es útil con tablas bidimensionales.
xtable(table(sex, answer))
```

% latex table generated in R 3.6.0 by xtable 1.8-4 package % Tue Sep 24 17:56:40 2019

	N	S
H	2	1
M	3	2