

# Factores, fechas y caracteres

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factor

Fechas

Caracteres

# Construimos un ejemplo

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```
N <- 100
edad <- sample(seq(18, 40, 1), N, replace=TRUE)
summary(edad)
```

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
18.00	23.00	28.50	28.63	34.00	40.00

```
sexo <- sample(c('H', 'M'), N, replace=TRUE)
class(sexo)
summary(sexo)
```

```
[1] "character"
      Length      Class      Mode 
      100 character character
```

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# Una variable cualitativa se define con factor

```
sexo <- factor(sexo)
```

```
class(sexo)
```

```
[1] "factor"
```

```
summary(sexo)
```

```
  H  M  
52 48
```

```
levels(sexo)
```

```
[1] "H" "M"
```

```
nlevels(sexo)
```

```
[1] 2
```

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# Los factor sirven para agrupar

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## ► Con la función table

```
table(edad > 30, sexo)
```

```
      sexo  
      H   M  
FALSE 29 25  
TRUE  23 23
```

```
table(edad %in% 20:30, sexo)
```

```
      sexo  
      H   M  
FALSE 25 31  
TRUE  27 17
```

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- Con `tapply` o `aggregate`

```
tapply(edad, sexo, mean)
```

```
      H      M  
28.82692 28.41667
```

```
aggregate(edad ~ sexo, FUN=median)
```

```
  sexo edad  
1    H 28.5  
2    M 28.5
```

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# Los factores sirven para separar

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```
edadSexo <- split(edad, sexo)  
class(edadSexo)
```

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

```
sapply(edadSexo, mean)
```

```
      H      M  
28.82692 28.41667
```

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# Los factores se pueden generar a partir de variables numéricas

- Por ejemplo, con `cut`

```
gEdad <- cut(edad, breaks=4)
class(gEdad)
```

```
[1] "factor"
```

```
levels(gEdad)
```

```
[1] "(18,23.5]" "(23.5,29]" "(29,34.5]" "(34.5,40]"
```

- Nuevamente `table`

```
table(gEdad)
```

```
gEdad
(18,23.5] (23.5,29] (29,34.5] (34.5,40]
      26         26         26         22
```

```
table(gEdad, sexo)
```

```
      sexo
gEdad  H  M
(18,23.5] 14 12
(23.5,29] 13 13
(29,34.5] 13 13
(34.5,40] 12 10
```

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**Fechas**

Caracteres

# Date

```
as.Date('2013-02-06')
```

```
[1] "2013-02-06"
```

```
as.Date('2013/02/06')
```

```
[1] "2013-02-06"
```

```
as.Date('06.02.2013')
```

```
Error en charToDate(x) :  
character string is not in a standard unambiguous format
```

```
as.Date('06.02.2013', format='%d.%m.%Y')
```

```
[1] "2013-02-06"
```

```
as.Date(37, origin='2013-01-01')
```

```
[1] "2013-02-07"
```

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# Secuencias temporales con Date

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```
seq(as.Date('2004-01-01'), by='day', length=10)
```

```
[1] "2004-01-01" "2004-01-02" "2004-01-03" "2004-01-04" "2004-01-05"  
[6] "2004-01-06" "2004-01-07" "2004-01-08" "2004-01-09" "2004-01-10"
```

```
seq(as.Date('2004-01-01'), by='month', length=10)
```

```
[1] "2004-01-01" "2004-02-01" "2004-03-01" "2004-04-01" "2004-05-01"  
[6] "2004-06-01" "2004-07-01" "2004-08-01" "2004-09-01" "2004-10-01"
```

```
seq(as.Date('2004-01-01'), by='10␣day', length=10)
```

```
[1] "2004-01-01" "2004-01-11" "2004-01-21" "2004-01-31" "2004-02-10"  
[6] "2004-02-20" "2004-03-01" "2004-03-11" "2004-03-21" "2004-03-31"
```

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# POSIXct

```
► help(format.POSIXct)
```

```
as.POSIXct('2013-02-06')
```

```
[1] "2013-02-06 CET"
```

```
ISOdate(2013, 2, 7)
```

```
[1] "2013-02-07 12:00:00 GMT"
```

```
hoy <- as.POSIXct('2013-02-06')
```

```
format(hoy, '%Y')
```

```
[1] "2013"
```

```
format(hoy, '%d')
```

```
[1] "06"
```

```
format(hoy, '%m')
```

```
[1] "02"
```

```
format(hoy, '%b')
```

```
[1] "feb"
```

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```
hora <- Sys.time()  
hora
```

```
[1] "2015-04-26 16:35:44 CEST"
```

```
format(hora, '%H:%M:%S')
```

```
[1] "16:35:44"
```

```
format(hora, '%H_horas,%M_minutos_y%S_segundos')
```

```
[1] "16 horas , 35 minutos y 44 segundos"
```

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# Secuencias temporales con POSIXct

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```
seq(as.POSIXct('2004-01-01'), by='month', length=10)
```

```
[1] "2004-01-01 CET" "2004-02-01 CET" "2004-03-01 CET" "2004-04-01 CEST"  
[5] "2004-05-01 CEST" "2004-06-01 CEST" "2004-07-01 CEST" "2004-08-01 CEST"  
[9] "2004-09-01 CEST" "2004-10-01 CEST"
```

```
seq(as.POSIXct('2004-01-01 10:00:00'), by='15_min',  
length=10)
```

```
[1] "2004-01-01 10:00:00 CET" "2004-01-01 10:15:00 CET"  
[3] "2004-01-01 10:30:00 CET" "2004-01-01 10:45:00 CET"  
[5] "2004-01-01 11:00:00 CET" "2004-01-01 11:15:00 CET"  
[7] "2004-01-01 11:30:00 CET" "2004-01-01 11:45:00 CET"  
[9] "2004-01-01 12:00:00 CET" "2004-01-01 12:15:00 CET"
```

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# Zonas horarias

```
as.POSIXct('2013-02-06 15:30:00',  
           tz='GMT')
```

```
[1] "2013-02-06 15:30:00 GMT"
```

```
as.POSIXct('2013-02-06 15:30:00',  
           tz='Europe/Madrid')
```

```
[1] "2013-02-06 15:30:00 CET"
```

```
hawaii <- as.POSIXct('2013-02-06 15:30:00', tz='HST')  
## Character  
format(hawaii, tz='GMT')
```

```
[1] "2013-02-07 01:30:00"
```

```
## POSIXct  
as.POSIXct(format(hawaii, tz='GMT'), tz='GMT')
```

```
[1] "2013-02-07 01:30:00 GMT"
```

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# Bastan unas simples comillas

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```
cadena <- "Hola_mundo"  
class(cadena)
```

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

```
nchar(cadena)
```

```
[1] 10
```

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# Un vector de character

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```
cadenaVec <- c("Hola_mundo", "Hello_world")  
nchar(cadenaVec)
```

```
[1] 10 11
```

```
length(cadenaVec)
```

```
[1] 2
```

```
cadenaVec[1]
```

```
[1] "Hola mundo"
```

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Fechas

Caracteres

# Para mostrarlos usamos cat o print

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```
a <- 2  
b <- 3
```

```
cat('La suma de', a, 'y', b, 'es', a + b, fill=TRUE  
    )
```

La suma de 2 y 3 es 5

```
cat('La suma de', a, 'y', b, 'es', a + b, '\n',  
    'La multiplicación de', a, 'por', b, 'es', a*b,  
    '\n')
```

La suma de 2 y 3 es 5  
La multiplicación de 2 por 3 es 6

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# Los character se pueden unir...

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```
paste('Hello', 'World', sep='_')
```

```
[1] "Hello_World"
```

```
paste('X', 1:5, sep='.')
```

```
[1] "X.1" "X.2" "X.3" "X.4" "X.5"
```

```
paste(c('A', 'B'), 1:5, sep='.')
```

```
[1] "A.1" "B.2" "A.3" "B.4" "A.5"
```

```
paste(c('A', 'B'), 1:5, sep='.', collapse='|')
```

```
[1] "A.1|B.2|A.3|B.4|A.5"
```

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Caracteres

... y también se pueden separar...

```
strsplit(cadenaVec, split='_')
```

```
[[1]]  
[1] "Hola" "mundo"  
  
[[2]]  
[1] "Hello" "world"
```

```
strsplit(cadenaVec, split='')
```

```
[[1]]  
[1] "H" "o" "l" "a" " " "m" "u" "n" "d" "o"  
  
[[2]]  
[1] "H" "e" "l" "l" "o" " " "w" "o" "r" "l" "d"
```

```
chSep <- strsplit(cadenaVec, split='_')  
class(chSep)
```

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

```
length(chSep)
```

```
[1] 2
```

```
sapply(chSep, nchar)
```

```
      [,1] [,2]  
[1,]    4    5  
[2,]    5    5
```

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## ... y, por supuesto, manipular

```
sub('o', '0', 'Hola_Mundo')
```

```
[1] "H0la Mundo"
```

```
gsub('o', '0', 'Hola_Mundo')
```

```
[1] "H0la Mund0"
```

```
substring(cadena, 1) <- 'HOLA'  
cadena
```

```
[1] "HOLA mundo"
```

```
tolower(cadena)
```

```
[1] "hola mundo"
```

```
toupper(cadena)
```

```
[1] "HOLA MUNDO"
```

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