

Lab01 - Basic Commands

▼ DATA TYPES:

- Numeric
- Character
- Logical
- Date
- Other complex structures (Vectors, Lists, Factors,...)

```
class(5) ##is a numeric value  
class(TRUE) ##is a logical  
class("hi") ## is a character
```

```
##you can introduce directly the diferent values
```

```
##NUMERIC
```

```
5+2
```

```
7/2
```

```
##CHARACTER
```

```
"5+2"
```

```
"Monday"
```

```
##LOGICAL
```

```
TRUE
```

```
T ## SE SUPONE QUE VALE AUNUQE NO LO ACEPTA EL NOTION
```

```
FALSE
```

```
F
```

```
##DATE
```

```
date() ##says the date
```

CASTING

the way is to put as.logical etc...

```
as.numeric("1") ##put a string into integer
as.logical(0) ##it's false the other values you introduce are Tl
as.character(1) ##put a numeric into character "1"
```

▼ LOGICAL AND RELATIONAL OPERATORS

- &: and
- |: or
- !: not
- ==: equal
- !=: not equal
- <: less than
- >: greater than
- <=: less than or equal to
- >=: greater than or equal to

```
5 == 5 ##TRUE
5>6 ##FALSE
5<=6##TRUE
5>=5 ##TRUE
"hello"=="hello"##true
"hello " == "hello"##it takes into account the spaces
"Hello" != "hello" ##TRUE
!TRUE ##FALSE
```

▼ DATA STRUCTURES

- **Variable:** structure that holds one item
-
- **Vector:** structure that holds multiple items that share type
-
- **List:** structure that holds multiple items with or without the same type
-

Matrix: bidimensional structure (like an array) with items that share type

-

Data Frame: bidimensional structure (array-like) with vectors as columns

VARIABLE

```
x <- 5
y = 10
```

VECTOR

```
my_vector <- c(2,3,5,7,11,13,17,19)
my_vector
1:5 #consecutive numbers between 1 and 5
10:1 #consecutive numbers between 10 and 1; the order is from 10 to 1
seq(1,20) #sequence of consecutive numbers between 1 and 20
seq(1,20,by=2) #1 3 5 7 9 11 13 15 17 19
seq(1,20, length=40) #sequence of 40 numbers evenly spaced from 1 to 20
[1] 1.000000 1.487179 1.974359 2.461538 2.948718 3.435897 3.923077 4.410256
[8] 4.410256 4.897436 5.384615 5.871795 6.358974 6.846154 7.333333 7.820513
[15] 7.820513 8.307692 8.794872 9.282051 9.769231 10.256411 10.743589 11.230769
[22] 11.230769 11.717949 12.205128 12.692308 13.179487 13.666667 14.153846 14.641026
[29] 14.641026 15.128205 15.615385 16.102564 16.589744 17.076923 17.564103 18.051282
[36] 18.051282 18.538462 19.025641 19.512821 20.000000
Como veis, son 40 numeros del 1 al 20 manteniendo una proporción constante
runif(20) #20 numbers between 0 and 1 (random)

##how to access the vector
my_vector[2] ##the position 2

positions <- c(1,5)
my_vector[positions] ##this is the way to get different values
my_vector[my_vector > 5] ##it gives you all the values greater than 5

##how to remove an item
```

```

my_vector[-(1:3)] # remove the first 3

##add elements
my_vector <- c(my_vector, -10, -20)
sort(my_vector) #sorts increasing
order(my_vector) #positions of the elements before sorting
##in both it doesn't change the vector only prints
sort(my_vector, decreasing = T)

##length
length(my_vector[1:5])
my_vector[length(my_vector)] # access the last item
my_vector[length(my_vector):(length(my_vector)-2)] # access 1

##Math
sum(my_vector) #addition of the elements
cumsum(my_vector) #cumulative sum of the elements no entiendo
second_vector <- my_vector * 2
second_vector
## [1] -2 -6 -10 4 6 10 14 22 26 34 38 -20 -40
my_vector[1:3] - second_vector[1:3]
## [1] 1 3 5
my_vector - 2
## [1] -3 -5 -7 0 1 3 5 9 11 15 17 -12 -22

##Name vector elements
names(my_vector)
4.2.4.5 Name vector elements
## NULL
names(my_vector) <- c("1st", "2nd", "3rd", "4th", "5th", "6th",
"9th", "10th", "11th", "12th", "13th")
my_vector
## 1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th 13th
## -1 -3 -5 2 3 5 7 11 13 17 19 -10 -20
names(my_vector)[1] <- "first.item"

```

```
##you change the value of the 1st
```

LIST

```
my_list <-list(5,6,"nice", "numbers")
my_list[2]
## 6
my_list[2][1]
## 6
my_list[[2]]
## 6
class(my_list[2])
## [1] "list"
class(my_list[2][1])
## [1] "list"
class(my_list[[2]])
## [1] "numeric"

##NAMED ITEMS
my_named_list <- list("AGE" = rnorm(100), "OTHER" = rnorm(100))
my_named_list["AGE"]

my_named_list[["AGE"]][1] ##the first element
```

MATRIX

```
my_matrix <-matrix(c(6,3,-2,3),nrow=2,ncol=2)
my_matrix
## [,1] [,2]
## [1,] 6 -2
## [2,] 3 3

## Accessing the matrix
my_matrix[1,2]
```

```
## [1] -2
my_matrix[4]
## [1] 3
my_matrix[2]
## [1] 3
```

DATA FRAME

```
my_df <- data.frame(ID=c(1,2,3,4), SEX=c("m", "f", "f", "f"), DM=
my_df
## ID SEX DM
## 1 1 m TRUE
## 2 2 f TRUE
## 3 3 f FALSE
## 4 4 f FALSE

ncol(my_df)
## [1] 3
nrow(my_df)
## [1] 4
names(my_df)
## [1] "ID" "SEX" "DM"
```

ejercicios