002-Main-data-types

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1 TP 02 - R Data Types - 2/4

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- Based on https://www.w3schools.com/r/default.asp

1.1 Numerics

[ ]:
```r
# Numeric
x <- 10.5
class(x)
```

[ ]:
```r
# Integer
x <- 1000
class(x)
```

[ ]:
```r
# Complex
x <- 9i + 3
class(x)
```

[ ]:
```r
# Numbers ?
x <- 10.5   # numeric
y <- 10     # integer
z <- 1i     # complex
```

[ ]:
```r
# Basic Maths operations on numbers
sqrt(16)  # square root

log(10)  # logarithm
log(10, base=2)  # logarithm with base 2

exp(2)  # exponential
```

[ ]:
```r
sin(pi)  # sine
cos(pi)  # cosine
tan(pi)  # tangent

asin(1)  # arcsine
```

```r
acos(1)  # arccosine
```

[ ]:
```r
factorial(5)  # factorial

choose(5, 2)  # binomial coefficient
```

[ ]:
```r
max(5, 10, 15)  # max
min(5, 10, 15)  # min
```

[ ]:
```r
abs(-4.7)  # absolute value
ceiling(1.4)  # round up
floor(1.4)  # round down
```

[ ]:
```r
round(1.4)  # round to the nearest integer
round(1.556789, 2)  # round to 2 decimals
```

[ ]:
```r
# Is it numeric ?
is.numeric(10) # TRUE
```

1.2 Strings

[ ]:
```r
# character/string
x <- "R is exciting"
class(x)
```

[ ]:
```r
# Strings without cat
str <- "Lorem ipsum dolor sit amet,
consectetur adipiscing elit,
sed do eiusmod tempor incididunt
ut labore et dolore magna aliqua."
str # print the value of str
```

[ ]:
```r
# strings with cat
str <- "Lorem ipsum dolor sit amet,
consectetur adipiscing elit,
sed do eiusmod tempor incididunt
ut labore et dolore magna aliqua."
cat(str)
```

[ ]:
```r
# nb of chars
str < -"Hello World!"
nchar(str)
```

[ ]:
```r
# grep
str < -"Hello World!"
grepl("H", str)
grepl("Hello", str)
```

```
grepl("X", str)
```

1.3 Boolean

[ ]:
```
# logical/boolean
x <- TRUE
x = FALSE
class(x)
```

[ ]:
```
# Please note that  :
TRUE + TRUE  # is 2
TRUE + FALSE  # is 1
FALSE + FALSE  # is 0
TRUE * TRUE  # is 1
TRUE * FALSE  # is 0
FALSE * FALSE  # is 0
```

[ ]:
```
# Logical operators
10 > 9  # TRUE because 10 is greater than 9
10 >= 9  # TRUE because 10 is greater than 9
10 == 9  # FALSE because 10 is not equal to 9
10 < 9  # FALSE because 10 is greater than 9
10 <= 9  # FALSE because 10 is greater than 9
10 != 9  # TRUE because 10 is not equal to 9
```

[ ]:
```
# of course ...
ans = 10 > 9
class(ans) # bool ?
print(ans)
```

[ ]:
```
# and and or
(10 > 9) & (10 > 9)  # TRUE because 10 is greater than 9 and 10 is greater than␣
 ↪9
(10 > 9) & (10 < 9)  # FALSE because 10 is greater than 9 but 10 is not greater␣
 ↪than 9
(10 > 9) | (10 < 9)  # TRUE because 10 is greater than 9 and 10 is not greater␣
 ↪than 9
!(10 > 9)            # FALSE because 10 is greater than 9
!(10 < 9)            # TRUE because 10 is not greater than 9
```

[ ]:
```
# fun fact
pi == 3.14159265
```

[ ]:
```
round(pi, 2) == 3.14
```

1.4 NULL, NA and NAN

[ ]:
```
# in R Null is a special value that means "no value"
x <- NULL
class(x)
```

[ ]:
```
# NA is used to represent missing values in a dataset
x <- NA
class(x)
```

[ ]:
```
# Inf
x <- 1000/0
class(x)
```

[ ]:
```
# NaN
x <- 0/0
class(x)
```

1.5 Ranges

[ ]:
```
range = 1:10
range
class(range)
```

1.6 In usage

[ ]:
```
3 %in% 1:10
100 %in% 1:99
```

[ ]:
```
# BUT :
100 %in% 1:100
```