My R notebook

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8/30/2020

# Entering Input

At the R prompt we type expressions. The **<-** symbol of the assignment operator.

x <- 1  
print(x)

## [1] 1

x

## [1] 1

msg <- "hello"  
print(msg)

## [1] "hello"

The grammar of the language determines wether an expression is complete or not.

## x <- ## Incomplete expression

The **#** character indicates a comment. Anything to the right of the **#** (including **#** itself) is ignored.

# Evaluation

When a complete expression is entered at the prompt, it is evaluated and the result of the evaluate expression is returned. The result may be auto-printed.

x <- 5 ## nothing printed  
x ## auto- printing occurs

## [1] 5

print(x) ## explicit printing

## [1] 5

The [1] indicates that x is a vector and 5 is the first element.

# Printing

x <- 1:20  
x

## [1] 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

The **:** operator is used to create integer sequences.

# Objects

R has five basic or “atomic” classes of objects:

* character
* numeric (real numbers)
* integer
* complex
* logical (True/False)

The most basic object is a vector

* A vector can only contain objects of the same class
* BUT: The one exception is a *list*, which is represented as a vector but can only contai nobjects of different classes (indeed, that’s usually why we use them)

Empty vectors can be created with the **vector()** function.

vector(mode = "integer", length = 0L)

## integer(0)

# Numbers

* Numbers in R are generally treated as numeric objects (i.e. double precision real numbers)
* If you explicitly want an integer, you need to sepcify the **L** suffix
* EX: Entering **1** gives you a numeric object; entering **1L** explicitly gives you an integer.
* there is also a special number **Inf** which represents infinity; e.g. **1 / 0**; **Inf** can be used in ordinary calcualtions; e.g. **1 / Inf** is **0**
* The value NaN represents an undefined value (“not a number”); e.g. **0 / 0**; **NaN** can also be tought of as a missing value (more on that later)

1

## [1] 1

1L

## [1] 1

n <- 1 / 0  
print(n)

## [1] Inf

m <- 1 / Inf  
print(m)

## [1] 0

c <- 0 / 0  
print(c)

## [1] NaN

# Attributes

R objects can have attributes:

* names, dimnames
* dimensions (e.g. matrices, arrays)
* class
* length
* other user-defined attributes/metadata

Attributes of an object can be accessed using the **attributes()** function.