Introduction to Scientific Computing for Biologists

ISCB20.09 - Introduction to R

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Section-4: Data Types in R

Data Types in R

R has five basic data types

- character(e.g: ‘abul’, “abul”)
- numeric(e.g: 2, 3)
- integer(e.g: 5L)
- complex(e.g: 5i)
- logical(True/False)

Numbers

- Numbers in R generally treated as numeric objects(i.e. double precision real numbers)
- If you explicitly want an integer, you need to specify the `L` suffix.
- There is also a special number `Inf` which is represents infinity; e.g. `1 / 0`
- `Inf` can be used in ordinary calculations; e.g. `1/Inf` is `0`
- The value `NaN` represents an undefined value("not a number"); e.g. `0/0`
- `NaN` can also be thought of as a missing value.

The numeric constants are

- integer(`L`)
- double
- complex(`i`)

Decimal vs Double vs Float

The Decimal, Double, and Float variable types are different in the way that they store the values. Precision is the main difference where float is a single precision (32 bit) floating point data type, double is a double precision (64 bit) floating point data type and decimal is a 128-bit floating point data type.

- Float - 32 bit (7 digits)
- Double - 64 bit (15-16 digits)
- Decimal - 128 bit (28-29 significant digits)

Characters

Character constants can be represented using either single quotes (’’) or double quotes (""") as delimiters.

Atributes

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.

Built-in Constants in R

```
pi # value of pi
```

```
[1] 3.141593
```

```
LETTERS
```

```
 [1] "A" "B" "C" "D" "E" "F" "G" "H" "I" "J" "K" "L" "M" "N" "O" "P" "Q" "R"
[20] "T" "U" "V" "W" "X" "Y" "Z"
```

```
month.name
```

```
 [1] "January"   "February"  "March"     "April"     "May"       "June"
 [7] "July"      "August"    "September" "October"   "November"  "December"
```