16SrRNA Intermediate Bioinformatics Online Course: Int_BT_2019

Introduction to R: objects, functions & data types/structures

Intro to R: assigning values to objects

- Assign values to objects in R
  - Assignment operator <- OR = ([see here](#))

- Consistent styling ([see here](#))
  - Objects cannot start with a number e.g. 2x   x2

  - Case sensitive
  - Base R function names are off-limits (e.g. if else for)

H3ABioNet
Pan African Bioinformatics Network for H3Africa

Intro to R: functions and arguments

- A **function** is **pre-written code** that can be accessed by '**calling**' the function **name** and specifying it's **arguments**
  - E.g. sqrt(); round()
  - Input: 'arguments' can be anything (numbers, filenames, other objects)
    - User-specified OR default?
  - Output: 'return' can be anything (or empty!)
  - Understanding functions: ?sqrt

Intro to R: data types & structures

- R data types: **logical, integer, real**, complex, **string (or character)**
- R data structures: **vector**, list, matrix, **data frame, factor**
- Vector: one-dimensional array
  - elements **in a vector** all have the same data type
  - R type conversion: logical → numeric → character ← logical
- **Subset** and extract values from **vectors []**
  - Conditional subsetting: > < >= <= == | & !
- Analyze vectors with **missing data (NA is not the same as 'NA' or N/A)**
  - is.na() na.omit() complete.cases()

H3ABioNet
Pan African Bioinformatics Network for H3Africa

Intro to R: Factors

- Categorical data
- Predefined set of unique values named 'levels' e.g. 'male' 'female'
- Alphabetically sorted (use function relevel() to change if necessary e.g. for plotting purposes)
- Careful with conversion of factor → numeric
- Careful when importing (stringsAsFactors=FALSE)
- Convert between strings and factors (as.factor())

R

- [R course material](#)

R data types useful links

- [R data types and structures: additional hands on](#)

H3ABioNet
Pan African Bioinformatics Network for H3Africa