

# **A (VERY) BEGINNER'S GUIDE TO R**

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# BEGINNING STEPS

**You should already have the current R version (4.0.2) and RStudio (requires R at least 3.0.1)**

**§ You should have installed the base system (R)**

**§ There are also add-on packages that we will be using today**

**Packages:**

- Collection of functions, examples and documentation (SUPER useful)**
- Usually designed for a specific task or set of tasks (usually created by users!)**

# R STUDIO

This is where computations are performed

§ An expression is inputted into the console and the expression is evaluated, saved objects appear in your workspace

Expression:

- Combination of one or more constants, variables, operations, or functions
- Interpreted by the programming language to produce a value = evaluation

R is CASE SENSITIVE! (Reminder: You will make many typos!!)

§ The system will output results to the console or by creating a graph in the plots window

§ Recalling and reexecuting previous commands: vertical arrow keys on the keyboard can be used to scroll forward and backward through a command history

§ To get the value of the last evaluated expression type “.Last.value “ into the console

§ Press “Esc” to stop evaluating the current expression

§ Tab completion: Type the first few characters of a command or filename, and press "tab"

# GETTING HELP

## GOOGLE!

Look at the documentation for a specific function from a loaded package,

- `?function name`
- `help(function name)`

To search the documentation of all installed packages for key words,

- `??"key words"`
- `help.search("key words")`

To run the example included with the documentation, `example(function name)`

# CALCULATOR

- **Binary Operators:** + - \* / ^ %%
- **Math Functions:** abs sqrt log exp log10 factorial
- **Trigonometric Functions:** sin cos tan asin acos atan
- **Rounding:** round ceiling floor trunc signif
- **Math Quantities:** Inf -Inf NaN pi exp(1) 1i

# CALCULATOR

## Relational Operators

Operator	Description
!	Logical NOT
&	Element-wise logical AND
&&	Logical AND
	Element-wise logical OR
	Logical OR

## Logical Operators

Operator	Description
<	Less than
>	Greater than
<=	Less than or equal to
>=	Greater than or equal to
==	Equal to
!=	Not equal to

# ASSIGNMENT

`<-`, `<<-`, `=`

**Use the operator `<-` for assignments (except for passing arguments in function calls)**

**The operators `<-` and `=` can be used to assign values into the environment in which they are evaluated, `=` is only allowed at the top level**

# OBJECT-ORIENTATION

**EVERYTHING** in R is an object

**Object: any value in memory (e.g., variable, function) that is referenced by an identifier (=name)**

**§ Objects may have attributes, such as type (mode: numeric, character, etc.), dimension, and class (more on that in later classes)**

**§ Attributes are part of the object**

**§ Assign an object a name "x" to be able to retrieve its value, using: `x <- object`**



# HEADING OVER TO THE R CODE!

We will finish up on RStudio