A Gentle Introduction to R

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Pop Quiz

We will review these *at the end*, so you can see how much you have learned.

- What does 'CRAN' stand for?
- Why is it called '`R`'?
- How can you use `R` *interactively*?
- How do you find out what a function does & how to use it?
- How do you store values to re-use later?
- True or False: Warnings can be ignored, but an Error means I made a mistake.
- True or False: Error messages will tell me how to fix the problem.

Learning Objectives

- Get familiar with the  *interface*
- Enter *commands*
  - input & output: using R interactively
  - use some common *functions*
- Understand *Errors* & *Warnings*
- Use technical *terms* for R concepts
- How to get Help

Why is it called R?

- R started as an *open-source* implementation of the S statistical computing language (S-PLUS)
  - S was created at Bell Laboratories in 1976
  - R was based on the S syntax (mostly v3), but works very differently "under the hood".
- R was created by **R**oss Ihaka and **R**obert Gentleman at the University of Aukland in the early 1990s.

The R Inteface

- R has a slightly different interface for each **O**perating **S**ystem (OS)
- GUI = **G**raphical **U**ser **I**nterface
- In every case, you interact with R primarily using a *command line*
  - aka "Question-and-Answer Model"
  - You ask R to do something (a *command*),
    and R tells you the answer (*result*).
  - Instructions are given to R using the *R language*.

R is a Calculator

```
1 + 1
```

```
## [1] 2
```

```
10 - 1
```

```
## [1] 9
```

```
2 * 2
```

```
## [1] 4
```

```
8 / 2
```

```
## [1] 4
```

```
2^3
```

```
## [1] 8
```

```
sqrt(9)
```

```
## [1] 3
```

- These are *expressions*.
- *Expressions* are *evaluated*, and the *result* is *returned* (sometimes *invisibly*).

Symbolic *Variables*

- You can store values (*objects*) in symbolic variables (*names*) using an *assignment operator*

`<-`	assign the *value* on the **right** to the *name* on the **left**

- Variable names can include:

letters	`a-z A-Z`
numbers	`0-9`
periods	`.`
underscores	`_`

```
A <- 10
B <- 10 * 10
A_log <- log(A)
B.seq <- 1:B

assign('x', 3)
```

- Variable names *should begin with a **letter***