INTRO TO R

Stats, Data Analysis, & Visualization

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OVERVIEW

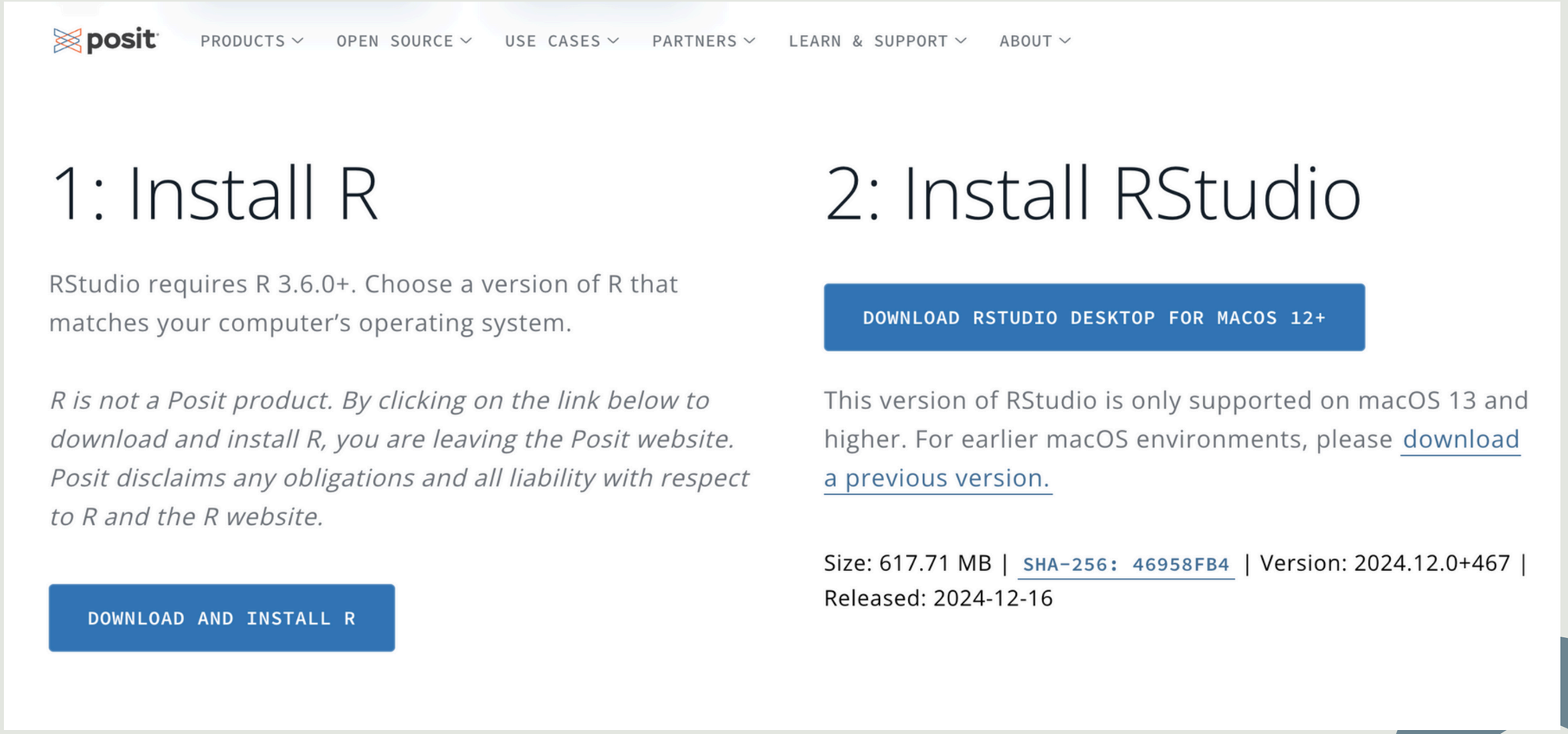
1. RStudio Download
2. Basic Syntax
3. Packages
4. Data Structures
5. Lets Start Coding!

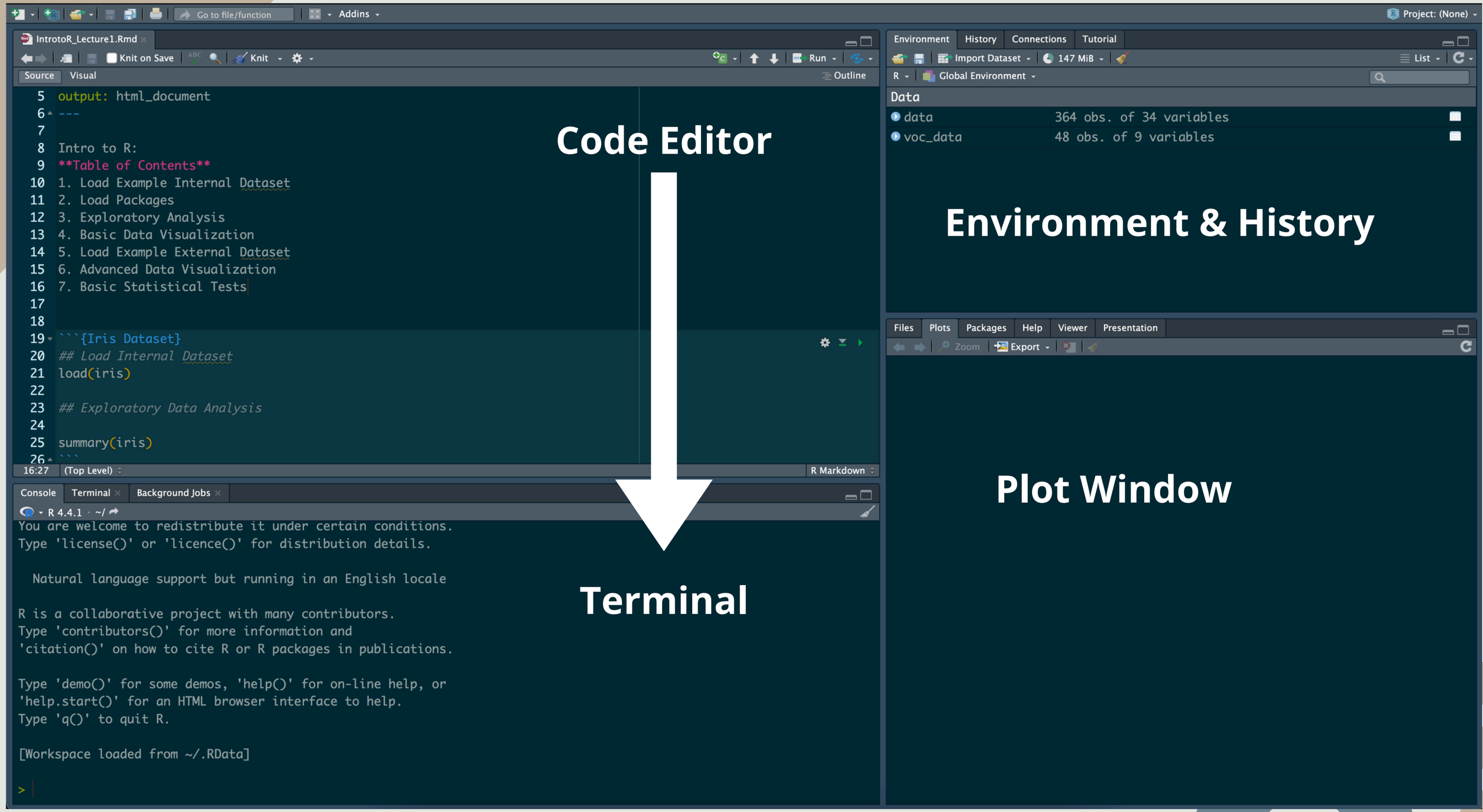
WHAT IS RSTUDIO?

A programming language for statistical analysis and data visualization

DOWNLOADING RSTUDIO

https://posit.co/download/rstudio-desktop/




Go to file/function
Addins
Project: (None)
IntrotoR_Lecture1.Rmd
Knit on Save
Knit
Run
Source
Visual
Outline
output: html_document

Intro to R:
Table of Contents
1. Load Example Internal Dataset
2. Load Packages
3. Exploratory Analysis
4. Basic Data Visualization
5. Load Example External Dataset
6. Advanced Data Visualization
7. Basic Statistical Tests
```{Iris Dataset}
## Load Internal Dataset
load(iris)
## Exploratory Data Analysis
summary(iris)
```
16:27
(Top Level)
R Markdown
Code Editor
Console
Terminal
Background Jobs
R 4.4.1 · ~/
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.
Natural language support but running in an English locale
R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.
Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.
[Workspace loaded from ~/.RData]
>
Terminal
Environment
History
Connections
Tutorial
Import Dataset
147 MiB
List
R
Global Environment
Data
data
364 obs. of 34 variables
voc_data
48 obs. of 9 variables
Environment & History
Files
Plots
Packages
Help
Viewer
Presentation
Zoom
Export
Plot Window

DATA TYPES

String: “I love fungi”

Boolean: Yes/No, On/Off, Present/Absent

Numerical: 1, 2, 3, 4, 5...

Logical: AND, WHERE, IF, etc.

BASIC SYNTAX

Basic Operators:

#: Comment

<-: Assignment

+: Addition

-: Subtraction

/: Division

***:** Multiplication

>=: Greater than or equal

<=: Less than or equal

!=: Not equal to

=: Is

==: Equal to

COMMANDS

Code that allows you to do different actions in R

Examples:

install.packages(“”)

library()

load()

read_csv(“../path/to/data”)

head()

tail()

colnames()

summary()

typeof()

data.frame()

plot()

PACKAGES: WHAT ARE THEY?

- Packages serve as add ons to the basic RStudio, giving extra functionality and “abilities” within your environment

- Packages have dependencies, which should automatically be loaded when you download the package

DATA STRUCTURES

Intro-to-R.R × | new_metadata ×

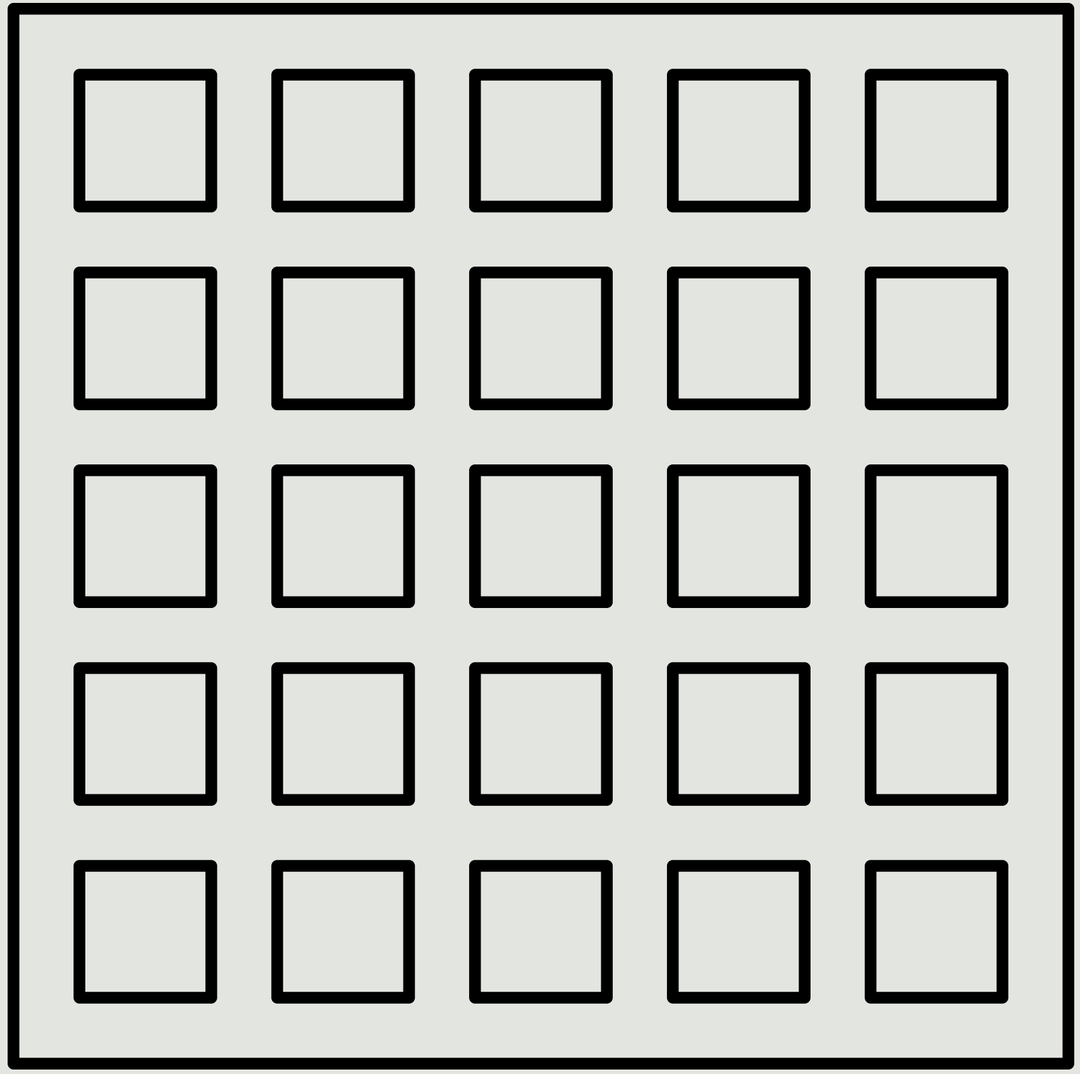
Filter

	genotype	celltype	replicate	samplemeans	age_in_days
sample1	Wt	typeA	1	10.266102	40
sample2	Wt	typeA	2	10.849759	32
sample3	Wt	typeA	3	9.452517	38
sample4	KO	typeA	1	15.833872	35
sample5	KO	typeA	2	15.590184	41
sample6	KO	typeA	3	15.551529	32
sample7	Wt	typeB	1	15.522219	34
sample8	Wt	typeB	2	13.808281	26
sample9	Wt	typeB	3	14.108399	28
sample10	KO	typeB	1	10.743292	28
sample11	KO	typeB	2	10.778318	30
sample12	KO	typeB	3	9.754733	32

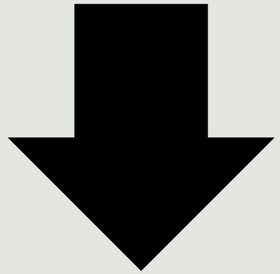
Showing 1 to 12 of 12 entries, 5 total columns

Columns

Rows



[Row:Column]



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TROUBLESHOOTING TOOLS

Questions?

Lets get Coding!