PROG101: Intro to R and RStudio

Introduction to R and RStudio

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Key concepts

- R is a programing language
- R Studio is IDE
- Writing code is not running code

A tour of RStudio

Editor

Open .R Files

Environment (outputs)

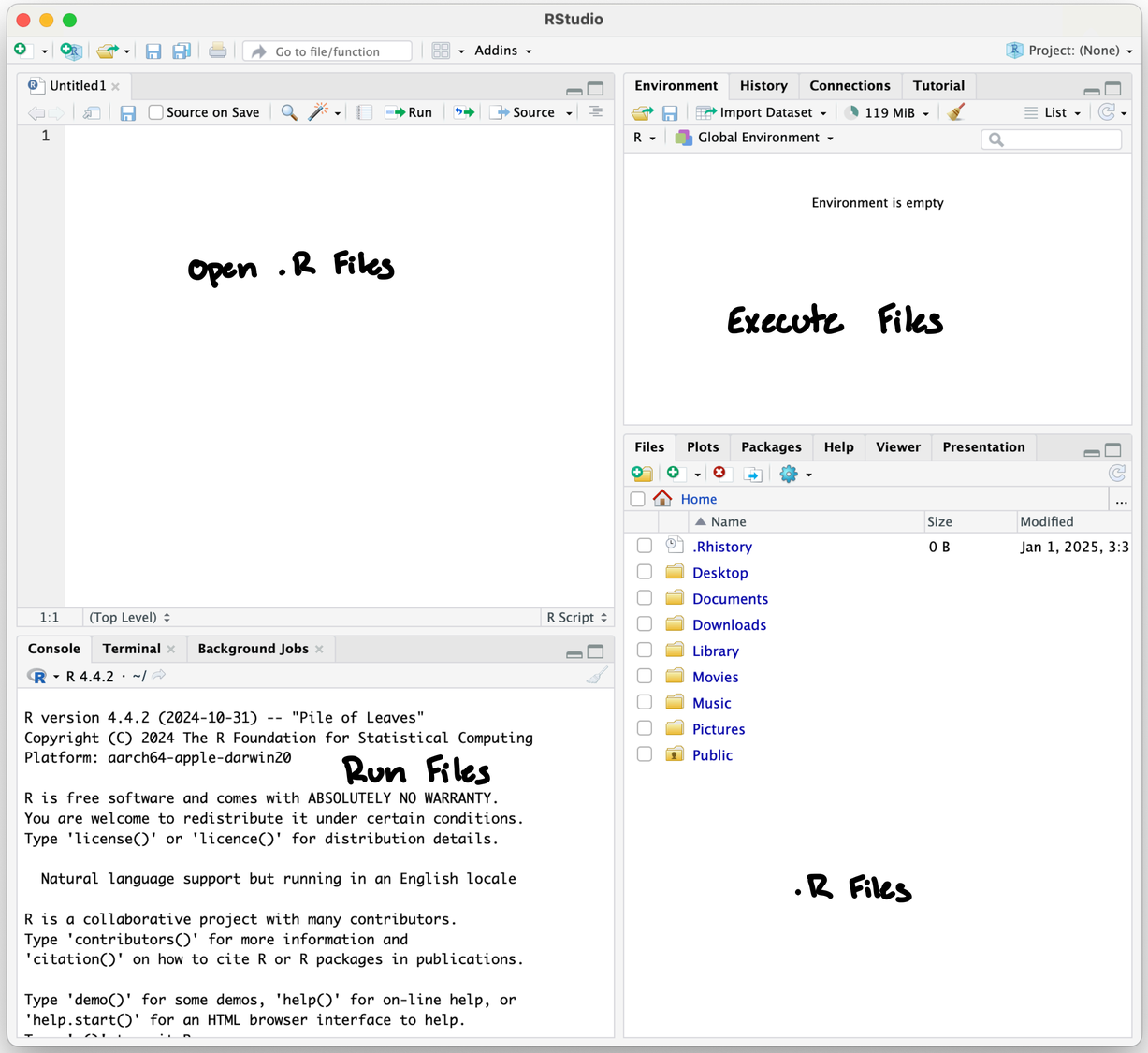
Execute Files

Console R

Run Files

files

.R Files



IDE features (interactive development environment)

- Help write code
- Interactivity
- Project management eg. file management

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Expressions and variables

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Key concepts

- Expressions are "sentences"
- Variables are "nouns"
- Functions are "verbs"

Expression examples

Control + Shift + /

allows text wrapping

See .R script

4850 J/g

$$\frac{5000000\,J}{225\,kg} = 22222.22\ J/g$$

4850 × 35 = 169750

New vocabulary and lingering questions

New vocabulary

Encapsulation: the bundling of Data with the ways in which it opperates.

variable: a label for encapsulated code

function: a line of code that performs some sort of output

Lingering questions

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Using functions

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Key concepts

- Functions are verbs; they do things
- Each function takes arguements as an input
- Functions encapsulate procedures

Function examples

look to prog101.R

New vocabulary and lingering questions

New vocabulary

Arguments: a specific peice of data for a function

Procedures: a task that the code will perform

Lingering questions

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Basics of vectors

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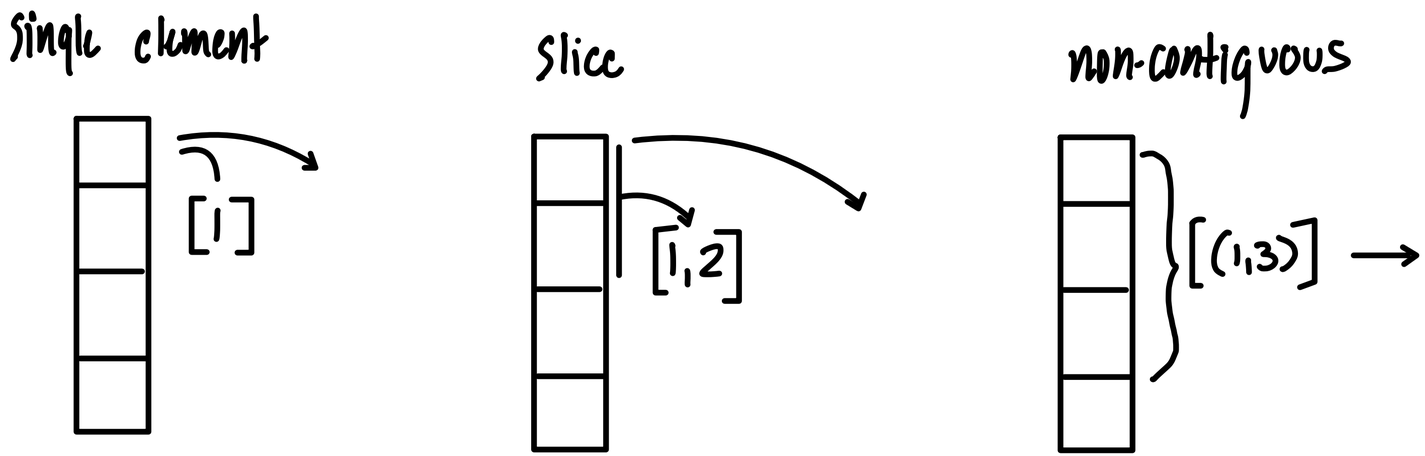
Key concepts

- Vectors are collections of elements all of the same type
- Access parts of vectors with indexing
- Pay close attention to output vector sizes

Vector examples

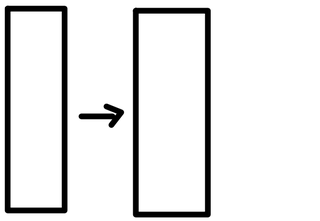
look to prog101-vectors.R

Vector indexing

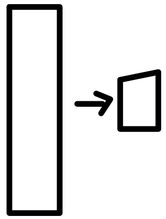


Vector output size

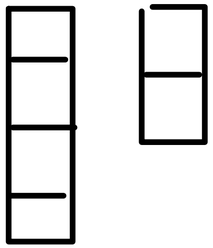
N → N
transformations



N → 1



N → M



New vocabulary and lingering questions

New vocabulary

Vectors: a one-dimensional array of values

Contiqious: continuous, one after the other

Output: the data that the computer gives the user

Indexing: a method of organizing a specific value(s)

Lingering questions

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Multiple vectors

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Key concepts

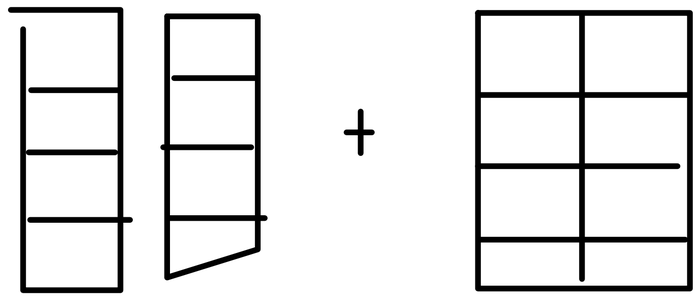
- Work on multiple vectors element-wise
- Use conditions of one vector to index another

Multiple vector examples

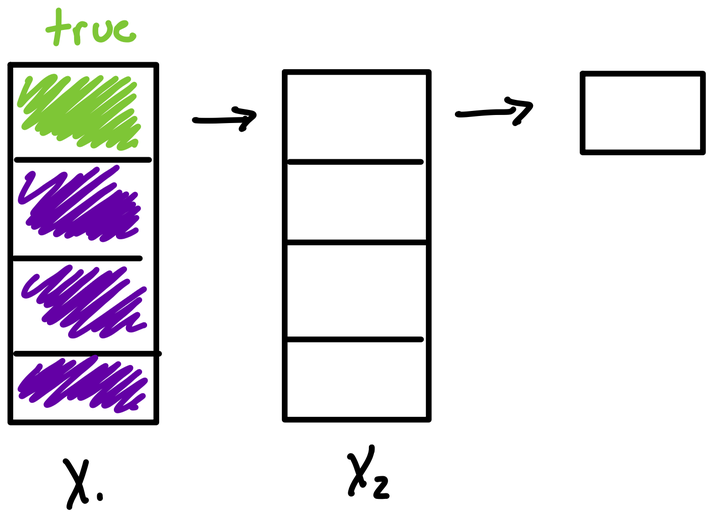
See prog101-multiple_vectors.R

Element-wise operations

e.g. +, paste



Multi-vector indexing



where x_i's

condition is true

give me the

value size

New vocabulary and lingering questions

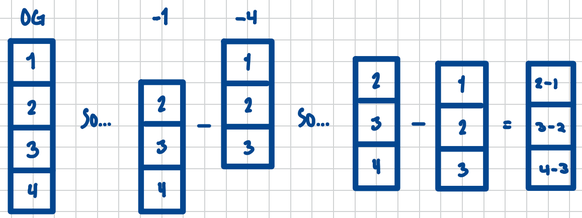
New vocabulary

Operators: symbols that signal for an operation

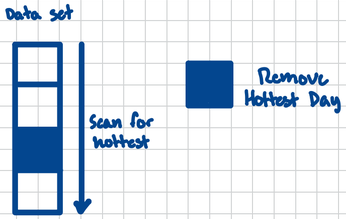
- usually mathematical symbols: =, <, >, etc.

Lingering questions

Aialik_interval:



Hottest and Coldest Day:



Remove Hottest Day