

Data 8, Lab 3

Data Types, Sequences, and Tables

Hubert Luo

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Agenda

1. Data Types
2. Arrays
3. Ranges
4. Tables
5. Lab Notebook

Data Types

- Functions
 - abs, max, min
- Numbers
 - Integers: 1,2,3
 - Float: 1.0, 2.1, 3.6, 9e2
- Strings
 - "data", 'science'
- Boolean
 - True, False

Data Types: Demo

- (Demo on Notebook)

Sequences: Arrays

- Array is sequence of values all of the same type
- To create an array, use the `make_array` function:
 - `make_array(1,2,3) -> [1,2,3]`
- Functions on arrays:
 - `sum`
 - `len`
 - `max`
 - `min`

Arrays: Demo

- (Demo on Notebook)

Sequences: Ranges

- Range is an array of consecutive numbers
- `np.arange(end)`
 - An array of increasing integers from 0 up to **end**
- `np.arange(start, end)`
 - An array of increasing integers from **start** up to **end**
- `np.arange(start, end, step)`
 - A range with **step** between consecutive values

Ranges: Demo

- (Demo on Notebook)

Creating Tables

- Each column in a table is an array of the same length!
- Two ways to create a table:
 - `Table().with_columns()` or `Table.read_table()`

The diagram shows a table with three columns: Name, Code, and Area (m2). The rows are California and Nevada. Annotations include a 'Label' box pointing to the 'Code' header, a 'Row' box pointing to the 'Nevada' row, and a 'Column' box pointing to the 'Code' column.

Name	Code	Area (m2)
California	CA	163696
Nevada	NV	110567

Some Table Operations

Name	Purpose	Example
sort	Create a copy of a table sorted by the values in a column	<code>tbl.sort("N")</code>
where	Create a copy of a table with only the rows that match some <i>predicate</i>	<code>tbl.where("N", are.above(2))</code>
num_rows	Compute the number of rows in a table	<code>tbl.num_rows</code>
num_columns	Compute the number of columns in a table	<code>tbl.num_columns</code>
select	Create a copy of a table with only some of the columns	<code>tbl.select("N")</code>
drop	Create a copy of a table without some of the columns	<code>tbl.drop("N")</code>
take	Keeps the <i>i</i> th row of a table	<code>tbl.take(i)</code>

Tables: Demo

- (Demo on Notebook)

Announcements

- Midterm is Friday 10/18
- Final is Monday 12/16
- No alternate exams
- Grades released weekly on Fridays
- For free response questions, submit regrade request on Gradescope
 - 1 week to submit regrade requests

Lab Notebook

TBD