

Row and Column Lookups

Students learn how to extract individual rows from a table, and columns from a row.

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| Lesson Goals | <p>Students will be able to...</p> <ul style="list-style-type: none">• Given a human-language request for a data display involving the entire Animals Dataset, break it down into parts and generate the display.• Given a Table, use the <code>row-n</code> function to extract any Row from that table• Given a Row, use the column lookups to extract the value of any column in the Row |
| Student-facing Lesson Goals | <ul style="list-style-type: none">• Let's practice making data displays to answer our questions about the data and retrieving information from tables. |
| Prerequisites | <ul style="list-style-type: none">• Simple Data Types• Contracts: Making Tables and Displays |
| Materials | <ul style="list-style-type: none">• PDF of all Handouts and Page• Animals Starter File• Lesson Slides• Printable Lesson Plan (a PDF of this web page) |

Glossary

data row :: a structured piece of data in a dataset that typically reports all the information gathered about a given individual

Overview

Students learn how to define values in Pyret, and practice by defining Numbers, Strings, and Images. They also learn how to define an individual row from a table in Pyret.

Launch

Sometimes we have a value that we want to use again and again, and it makes sense to define a name for it. Every definition includes a *name* and a *value*. In the code below, we have definitions for a String, a Number and an Image.

```
name = "Flannery"  
age = 16  
logo = star(50, "solid", "red")
```



- What are the names given in each of these definitions?
 - *name, age, and logo*
- What are the values given to each of these names?
 - *The String "Flannery", the Number 16, and an Image of a solid red star.*

Investigate

Remind students that examples of lookup questions include, "How many legs does Felix have?" or "What species is Sheba?"



- How many rows do we need to answer a Lookup question?
 - *Just one! Lookups can be answered just by finding the right row!*

Make sure sure students understand we only need one row!

What code can we write, to let us define a single row? Tables have special functions associated with them, which allow us to do all sorts of things. For example, we can get the first *data row* in a table by using the `row-n` function: `row-n(animals-table, 0)`

Ask Questions



Don't forget: data rows start at index zero!



- Open your saved Animals Starter File (or make a new [Animals Starter File](#) copy), and click “Run”.
- In the Interactions Area, use the `row-n` function to get the second and third data rows.
- Find `row-n` on the [Contracts Page](#). What is its Domain? Its Range?
 - *Its domain is Number. Its range is Row.*

How would you get the *second* row out of the animals table? The third?

The code below will define the first row from the animals table:

```
sasha = row-n(animals-table, 0)
```

It’s often better to name our Row definitions according to the *property we care about*. In this case, the fact that this row is a cat is *much* more interesting than the fact that her name is Sasha:

```
cat-row = row-n(animals-table, 0)
```



- In the Animals Dataset, there are subsets that we might want to analyze: dogs, cats, lizards, old animals, young animals, fixed animals, etc.
- Complete [Defining Rows](#).
- When you’re done, open your saved Animals Starter File (or make a new [Animals Starter File](#) copy) and add these definitions after the definitions for `dog-row` and `cat-row`.
- The rows you added will be used later!

Synthesize

- We named rows by a lot of different properties (e.g. - their species, sex, etc). What are some other properties of rows in this dataset that we could use?
- What are some properties of **your dataset** that you might want to define rows for?

Overview

Students learn how to access a particular column from a row.

Launch

We can also access *columns* of a Row, by using a **Row Accessor**. Row accessors start with a Row value, followed by square brackets, and the name of the column where the value can be found. Here are three examples that use row accessors to get at different columns from the first row in the animals-table:

```
row-n(animals-table, 0) ["name"]
row-n(animals-table, 0) ["age"]
row-n(animals-table, 0) ["fixed"]
```

And of course, we can use our defined name, substituting it in place of all the redundant code:

```
cat-row ["name"]
cat-row ["age"]
cat-row ["fixed"]
```

Investigate



- Complete the exercises on [Lookup Questions](#).
- Complete [More Practice with Lookups](#)

Synthesize

- Why is it important to be able to define individual rows?