

## **Python Review including Lists and Loops**

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## **Python Review -- Data Types**

You are now experts at **five different types** of data in Python:

| Data Type | Functionality  |  |
|-----------|--|--|
|           | Stores a single number   |  |
|           | Stores a series of characters (eg: a word or many words)                     |  |
|           | Stores a CSV-like structure with rows (observations) and columns (variables) |  |
|           | Stores a collection of (usually similar) values                              |  |
|           | Stores a collection of (usually related) key/value pairs                     |  |

We will begin working with Lists and Dictionaries in more advanced ways. Let's explore them both a bit more now that you have used them in simulations:

| 1. | A list ar | nd a d | lictionary | are both | collecti | ons: |
|----|-----------|--------|------------|----------|----------|------|
|    |           |        |            |          |          |      |

- 2. A list and a dictionary can be both be **initialized as an empty collection**:
- 3. A list and a dictionary can both be initialized with a collection of elements:
- 4. We can **add new items** to both a list and a dictionary:
- 5. We can **look items up** from both a list and a dictionary:

## **Examples of Lists and Dictionaries in Use in Python**

In this series of examples, consider this to be several cells in a single notebook:

|                      | Code   | Output |
|----------------------|--|--------|
| 1<br>2<br>3          | <pre>d = {} d['waf'] = 'Wade' d</pre>  |        |
| <b>4 5</b>           | <pre>d['kflan'] = 'Karle' d</pre>  |        |
| 6                    | d['waf']   |        |
| 7 8                  | nums = [107, 207, 307]<br>nums   |        |
| 9<br>10              | nums.append(407) nums  |        |
| 11                   | nums[1]  |        |
| 12                   | nums[0]  |        |
| 13<br>14<br>15<br>16 | <pre>netids = [] netids.append('waf') netids.append('kflan') netids</pre>                                  |        |
| 17                   | netids[0 + 1]  |        |
| 18                   | d[ netids[0] ]   |        |
| 19<br>20<br>21<br>22 | <pre>blue = random.randint(1, 6) red = random.randint(1, 6) dice = { 'blue': blue, 'red': red } dice</pre> |        |
| 23<br>24             | data = [dice]<br>data  |        |
| 25<br>26<br>27       | <pre>import pandas as pd df = pd.DataFrame( data ) df</pre>  |        |
| 28                   | df['blue']   |        |

## **Lists and Loops**

Let's explore for-loops in the same way:

|             | Code   | Output |
|-------------|--|--------|
| 1 2         | letters = ['A', 'B', 'C', 'D']<br>letters[2]                           |        |
| 3 4         | <pre>letters.append('E') letters</pre>                                 |        |
| 5<br>6<br>7 | <pre>print( letters[2] ) print( letters[0] ) print( letters[1] )</pre> |        |
| 8 9         | <pre>for i in range(10):    print(i)</pre>                             |        |
| 10          | <pre>len( letters )</pre>  |        |
| 11<br>12    | <pre>for i in range( len(letters) ):    print(i)</pre>                 |        |
| 13<br>14    | <pre>for i in range( len(letters) ):    print( letters[i] )</pre>      |        |
| 15<br>16    | <pre>for i in range( len(letters) ):    print( letters[i + 1] )</pre>  |        |