KEY_Lesson07_2D_Lists_Indexing

July 12, 2019

1   2D Lists Indexing

Remember: - Lists can be used to group different values together - it's just a collection of things.
- You can make a list in Python by putting different things in a box of brackets [] separated by
commas - You can make lists of lists, which are called 2D lists

Here we're going to learn how to index lists of lists. Let's recreate our 2D list of `food`:

```python
[1]: # create 2D list
     food = [['apple', 'banana', 'grape', 'mango'],
             ['lettuce','carrot','cucumber','beet'],
             ['chicken', 'beef', 'fish', 'pork']]

     # print 2D list along with its length
     print(food)
     print(len(food))
```

```
[['apple', 'banana', 'grape', 'mango'], ['lettuce', 'carrot', 'cucumber',
'beet'], ['chicken', 'beef', 'fish', 'pork']]
3
```

Like we saw in the last lesson, the length of the `food` list (3) is the number of 1D lists that make
up the 2D list. The fruit list is the first element in `food`. To get this first element from `food`, we do
it the same way we would in a 1D list:

```python
[2]: # get the fruit list from the food list
     food[0]
```

```
[2]: ['apple', 'banana', 'grape', 'mango']
```

In this way, we can think of the list `food` as a 1D list, where each element is another list. As we
saw in the last command, we can reference the first sublist from `food` using `food[0]`.

Knowing this, how can we get the length of the first list within `food`?

```python
[3]: # print length of the first index of food
     len(food[0])
```

```
[3]: 4
```

Thinking back to indexing 1D lists, how do you think we can get the lists fruit and vegetables
from the list `food`?

1

```
[4]: # get fruit and vegetables from the list
     food[0:2]
```

```
[4]: [['apple', 'banana', 'grape', 'mango'],
      ['lettuce', 'carrot', 'cucumber', 'beet']]
```

What if we want to get the value `'mango'` from our list? We can first save the first element from `food` to a variable `fruit`, and then index the `fruit` list:

```
[5]: # get the fruit list from food and save it in the variable fruit
     fruit = food[0]

     # print the fruit list to make sure you got what you wanted
     print(fruit)

     # get mango from the fruit list
     fruit[3]
```

```
['apple', 'banana', 'grape', 'mango']
```

```
[5]: 'mango'
```

We can also get the value `'mango'` from our list in one line! To do this, we can just index `food` twice. The first index is to get the fruit list, and the second index is to get `'mango'` from the fruit list:

```
[6]: # get mango by indexing the food list twice
     food[0][3]
```

```
[6]: 'mango'
```

How can you get `'carrot'` from the `food` 2D list?

```
[7]: # get carrot from the food 2D list
     food[1][1]
```

```
[7]: 'carrot'
```

Now, try getting `'fish'` and `'pork'` from the `food` 2D list:

```
[8]: # get fish and pork from the food 2D list
     food[2][2:4]
```

```
[8]: ['fish', 'pork']
```

Finally, let's make a new list called `favorites` with your favorite food within each list in `food`. Print it out afterwards to make sure you did what you want!

```
[9]: # make a list of your favorite fruit, vegetable, and meat
     favorites = [food[0][3], food[0][2], food[2][1]]

     # print favorite
     print(favorites)
```

```
['mango', 'grape', 'beef']
```

Nice job! You just learned how to index 2D lists in Python!