KEY_Lesson07_2D_Lists_Indexing

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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`:

[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:

[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`?

[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`?

[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!