Python Chapter 8: Arrays

This guide has been written to reinforce your learning with the actual chapter lessons and not to serve as alternative way of learning python. I have tried my best to explain and provide explanations; however, if you find anything that needs to be corrected, please inform me.

- Maruthi Basava

BEFORE YOU START WRITING CODE, PLEASE BE AWARE THAT WHITESPACES MATTER IN PYTHON. LEAVING STRAY SPACES IN VARIOUS AREAS COULD CRASH YOUR PROGRAM. PLEASE MAKE SURE THAT THE SYNTAX IS CORRECT.

In this chapter we will learn about arrays. Make sure that you focus more as arrays are a very important topic.

What is an array?

Think array as a box that can only store books of the same genre. In programming, an array is under one variable name but can store BILLIONS of data points. Pretty cool huh?

Also remember, in python, they use lists rather than arrays, which basically is the same thing.

Lists in Python:

```
months = ["Jan", "Feb", "Mar", "Apr", "May"]
print months
```

Terminal:

```
['Jan', 'Feb', 'Mar', 'Apr', 'May']
```

We made a variable equal to a list of strings.

Getting data from lists:

To get data from lists in python, we have to use subscripts like the following.

```
months = ["Jan", "Feb", "Mar", "Apr", "May"]
print months[0]
```

Terminal:

```
Jan
```

The [0] basically means that the array will give you whatever data is in the 0th index (because every array starts with 0 then 1, 2, 3, and so on,

Len function:

If you wanted to know how big a list is, then you must use the **len** function. The **len** function gives you an integer value of how big the list is.

```
months = ["Jan", "Feb", "Mar", "Apr", "May"]
print len(months)
```

Terminal:

```
5
```

Iterating through a list:

If you wanted to go through the entire list and do something to them, you can use the **for loop**.

The for loop is just like the while loop but it automatically moves to the next index and creates a current element variable.

The structure of a for loop looks like this:

For current_element_name **in** list_name:

Line of code

Line of code

...

Python:

```
months = ["Jan", "Feb", "Mar", "Apr", "May"]

for month in months:
    print "I love " + month
```

Terminal:

```
I love Jan
I love Feb
I love Mar
I love Apr
I love May
```

Two dimensional arrays:

In python, you can have arrays inside of arrays, this is what we call two dimensional arrays.

It looks like this:

```
tic_tac_toe = [ ['O', 'X', 'O'],
                ['X', 'X', 'X'],
                ['O', 'X', 'O'] ]

print tic_tac_toe
```

Terminal

Iterating through a two dimensional array:

To iterate through a two dimensional array, you need **TWO** while loops: one to iterate through the rows, and the second one to iterate through the columns.

Then to access the data, we need to use two subscript notions that looks like this [row][column]. The first number is the index of the row, while the second number is the index of the column.

Take a look at this program down below.

```
# COLUMN            0    1    2
tic_tac_toe = [ ['O', 'X', 'O'],   # ROW 0
                ['X', 'X', 'X'],   # ROW 1
                ['O', 'X', 'O'] ] # ROW 2

numRow = len(tic_tac_toe)
numCol = len(tic_tac_toe)

row = 0

while row < numRow:

    col = 0

    while col < numCol:

        print tic_tac_toe[row][col]

        col = col + 1

    row = row + 1
```

Terminal: