Adamson University
College of Engineering
Computer Engineering Department

Linear Algebra

Laboratory Activity No. 1

Getting Acquainted with Python

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I. Objectives

This laboratory activity aims to implement the principles and techniques of lists and arrays. To learn different methods and functions we could use in implementing lists.

II. Methods

This laboratory aims to teach us different functions that can used in lists. It teaches us on how to make coding shorter and simpler. By doing so, we are able to create data that are easier to understand so that we can know what are the things that are wrong in the program. By studying the uses of many different functions, we are able to find way to shorten our codes while also having the same output of it.

III. Results

```
In [9]: party = ['Charmander', 'Pidgey', 'Sandshrew', 'Rattata', 'Abra']
        levels = [15, 11, 18, 5, 14]

In [35]: print(party[0],"at level ",levels[0])
         print(party[1],"at level ",levels[1])
         print(party[2],"at level ",levels[2])
         print(party[3],"at level ",levels[3])
         print(party[4],"at level ",levels[4])

         Charmander at level  15
         Pidgey at level  11
         Sandshrew at level  18
         Rattata at level  5
         Abra at level  14
```

Figure 1 Codes and output for cell #1

To print the required output, I first call the first element of the list “party” to print it, which is in array [0], then print “at level” then call again the first element of the list “levels” to print it. Then repeat the process to print the other elements of the list.

```
In [36]: reserves = [
             ('Onix',10),
             ('Slowpoke',18),
             ('Dialga',2),
             ('Magikarp',32),
             ('Feebas',22),
             ('Swablu',19),
             ('Regigigas',3),
             ('Unown',50)
         ]
         def pokemon_level(reserves):

             reserves.sort(key = lambda x: x[1], reverse = True)
             return reserves

         x = pokemon_level(reserves)
         print([x [0] for x in reserves[0:3]])
```

```
['Unown', 'Magikarp', 'Feebas']
```

Figure 2 Codes and output for cell #2

Using the sort() function, I defined a function that would arrange the reserves list.

I defined it so the list would be arranged in descending order by the second item of the list. After arranging it, I define it unto a variable then print the first three item of the list.

```
In [44]: def create_party(party, candidates):
             return suggested_parties == party, x

         party = ['Charmander', 'Pidgey', 'Sandshrew', 'Rattata', 'Abra']
         x = pokemon_level(reserves)

         party.append(x[0][0])
         print(party)
         party.pop()
         party.append(x[1][0])
         print(party)
         party.pop()
         party.append(x[2][0])
         print(party)
```

```
['Charmander', 'Pidgey', 'Sandshrew', 'Rattata', 'Abra', 'Unown']
['Charmander', 'Pidgey', 'Sandshrew', 'Rattata', 'Abra', 'Magikarp']
['Charmander', 'Pidgey', 'Sandshrew', 'Rattata', 'Abra', 'Feebas']
```

Figure 3 Codes and output for cell #3

In the last graded cell, using append() function I added the specific pokemon from the the reserves to the list “party”. I accessed the specified item form the reserves list then added it to the party list. Then I removed the item I added using pop() function. After I remove the item, I’ve added the other item from the reserves list

IV. Conclusion

1. In your perspective, what is the difference between Python and C++ or other languages you have used before?

I find it easier to understand other languages that I've used before such as C++ and C#, this is because in C# I have many more options on how can I make my code. We used windows application in C# and using this we make lesser codes but still having an output while when we use python, we needed to import from its library.

2. Enumerate and briefly discuss the functions you have used in the laboratory exercise, please cite their usage using their respective documentations.

Many functions were used to complete this activity. [1] In the first graded cell, we have our list, which is the collection of our items. To print the specific item in the list, we access it by calling the list and the specified position of the item that we need. In the next graded cell, we used more functions to achieve the target output for it. [2] By creating a function, we used it to create the parameter that we need in sorting the list. We used sort() to sort it in its second item of the list. [3] Sort() method is used to sort the list in the criteria given or by the default way. I used lambda to express the items that are to be sorted. [4] Lambdas can take many arguments or parameters but will still be one expression. Then I sorted the list in descending order using the syntaxes provided in the sort() method. Then unto the last graded cell, I used two functions, the append() and pop() functions. [5] The append() function to add the elements to the list that I want to. In the exercise, I only added the specific item from the list to the other list by accessing on to the first list. [6] The pop() function is used to remove an item in a specified position from the list.

3. In your perspective, what is the advantages and disadvantages of using Python and Jupyter Notebooks?

I think using Python on Jupyter Notebooks is easier than other IDEs. This is because it using Jupyter Notebooks I can quickly practice codes that are given then I can test and modify in it. For me it is faster to try it in Jupyter Notebooks. I also think Jupyter is better because its files can be easily shared to others. Using Jupyter, we are able to receive our works faster. Its disadvantages are its hard to use it when creating longer programs. But personally I like Jupyter more because my laptop runs faster when than using other IDEs such as Pycharm.

References

[1] W3schools.com. n.d. *Python Lists*. [online] Available at: <https://www.w3schools.com/python/python_lists.asp> [Accessed 4 October 2020].

[2] W3schools.com. n.d. *Python Functions*. [online] Available at: <https://www.w3schools.com/python/python_functions.asp> [Accessed 4 October 2020].

[3] W3schools.com. n.d. *Python List sort() Method*. [online] Available at: < https://www.w3schools.com/python/ref_list_sort.asp> [Accessed 4 October 2020].

[4] W3schools.com. n.d. *Python Lambda*. [online] Available at: < https://www.w3schools.com/python/python_lambda.asp> [Accessed 4 October 2020]

[5] W3schools.com. n.d. *Python List append() Method*. [online] Available at: <https://www.w3schools.com/python/ref_list_append.asp> [Accessed 4 October 2020]

[6] W3schools.com. n.d. *Python List pop() Method*. [online] Available at: <https://www.w3schools.com/python/ref_list_pop.asp> [Accessed 4 October 2020]

[7] GeeksforGeeks. 2019. *Python Program To Sort A List Of Tuples By Second Item - Geeksforgeeks*. [online] Available at: <https://www.geeksforgeeks.org/python-program-to-sort-a-list-of-tuples-by-second-item/> [Accessed 4 October 2020].