# **Programming Assignment Unit 6**

Computer Science, University of the People

CS 1101-01 Programming Fundamentals - AY2024-T1

Instructor, Jose Alvarado

October 18, 2023

## List Manipulation

**Part 1: Employees and Salaries**

For the first part of this exercise, we were asked to write a program that initializes and then manipulates a list. The manipulations are:

1. Split the list into two sub-lists namely subList1 and subList2, each containing 5 names.
2. A new employee (assume the name “Kriti Brown”) joins, and you must add that name in subList2.
3. Remove the second employee's name from subList1.
4. Merge both the lists.
5. Assume there is another list salaryList that stores the salary of these employees. Give a rise of 4% to every employee and update the salaryList.
6. Sort the SalaryList and show the top 3 salaries.



The first thing we are going to do is create and initialize a list of employee names. This list will be the base list that we base all our future lists and data on.



The first thing we are tasked to do is to split our initial list into two smaller lists. The easiest way to do this is to use the array splicing syntax. The first line we use is the ‘:5’ this tells the interpreter to take the first five items from the list and build a new list from them. The second line ‘5:’ tells the interpreter to take the items from the list starting after the fifth item and until the end of the list.



The second step is to add the new employee to the second list we created in Step 1. To accomplish this, we are going to use the built-in append function which takes a value passed into it and appends the value to the end of the list.



For this step we want to remove the second employee from the list, so to do this we are going to use the built-in pop function. This function can take in a parameter to indicate the index of the item we want to remove from the list. It is important to note that this function returns the value popped from the list and modifies the list itself.



The next step requires us to re-combine the two smaller lists back into a new combined list. We can accomplish this by using the plus (+) operator this will take the first list (left) append the second list (right) to the end of it and return a new list of the combination.



Before we continue to the next steps, we need to create a list of salaries. To do this we can use the random library that comes with Python to generate a list of random numbers between 40,000 and 100,000. The list we create should be the same length as the newly merged employee list. An important note is that since we are generating the values randomly the output will change each time, we run this code. Also, the ‘import random’ line should be at the top of the code file.



The next step is to take the salary list we created and for each value in it, we need to add a 4% increase. To achieve this, we are going to build a new list by iterating over the current salary list and for each item in it we will multiply it by 1.04 (104%). This will result in a new list with the new increased values. The new list is stored in the existing variable overriding the old list.



The final step in this part requires us to find the three highest values in the modified salary list. The first thing we can do is sort the list using the built-in ‘sort’ function. This will re-order the list. Since we want the top highest items, we can pass the named parameter ‘reverse’ to the function telling the function to order the items in reverse order or other words from largest to lowest. Once we have an ordered list, we can then use the splice command ‘:3’ to get the first three items from the list. This results in a list of three values being the highest values in the updated salary list.

**Part 2: Splitting a sentence.**

For this part, we are asked to build a program that takes a sentence and splits it into words using the spaces. The list should then be stored in a list which will be then reversed and then the result will be printed out to the console.



In the code above we first build a function that takes a single parameter. The parameter passed represents the sentence that we want to split and reverse. The first command in the function uses the ‘split’ function that runs on the string and returns a list of items based on the optional parameter passed in, if none is supplied like the above a space is used as the splitter. We then take the resulting list, and we execute the splicing command using a reverse step value of negative one. This will result in the command running over the list in reverse order from the end to the beginning. Lastly, the function returns the newly reversed list to the function caller. After this all we need to do is select an appropriate sentence, in my case I chose a quote from the Movie, Blade Runner (1982). We then pass the sentence into the function making sure to store the returned value to a variable. We then finally print the resulting list to the console.

## References

Python 3 Documentation

<https://docs.python.org/3/>

Think Python - How to Think Like a Computer Scientist (2nd Edition, Version 2.4.0)

Chapters 1-10

Blade Runner (1982)

Movie - <https://www.imdb.com/title/tt0083658/>

Source Scripts:

