Data Structure and Algorithm

Laboratory Activity No. 5

Implementation of Arrays

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# Objectives

Introduction

Array, in general, refers to an orderly arrangement of data elements. Array is a type of data structure that stores data elements in adjacent locations. Array is considered as linear data structure that stores elements of same data types. Hence, it is also called as a linear homogenous data structure.

This laboratory activity aims to implement the principles and techniques in:

* Writing algorithms using Array data structure
* Writing a python program that can implement Array data structure

# Methods

* Write a Python program to create an array of 10 integers and display the array items. Access individual elements through indexes and compute for the sum.
* Write a Python program to append a new item to the end of the array. Original array: numbers = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
* Write a Python program to insert a new item before the second element in an existing array. Original array: numbers = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
* Write a Python program to reverse the order of the items in the array. Original array: numbers = [5, 4, 3, 2, 1]
* Write a Python program to get the length of the array. Original array: numbers = [5, 4, 3, 2, 1]

# Results

Present the visualized procedures done. Also present the results with corresponding data visualizations such as graphs, charts, tables, or image . Please provide insights, commentaries, or explanations regarding the data. If an explanation requires the support of literature such as academic journals, books, magazines, reports, or web articles please cite and reference them using the IEEE format.

Please take note of the styles on the style ribbon as these would serve as the style format of this laboratory report. The body style is Times New Roman size 12, line spacing: 1.5. Body text should be in Justified alignment, while captions should be center-aligned. Images should be readable and include captions. Please refer to the sample below:

A screenshot of a computer program

AI-generated content may be incorrect.

Figure 1 Screenshot of program

In this picture you will see a 9 Element in the index and their sum is calculated. The output reflects both the individual elements and the total sum of the array.

A screenshot of a computer program

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Figure 2 Screenshot of program

As you can see you see the original array from 1 to 10 then when I updated array after the new item 11 is added. The append () method in Python adds an element to the end of the list.

A screenshot of a computer program

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Figure 3 Screenshot of program

In this code it is about to update array as you can see, I add new\_item 100 and insert index 1, and new\_item then print the updated array which is 100 so the 2 it will change to 100.

A screenshot of a computer program

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Figure 4 Screenshot of program

In this code it is about to reverse array so the original array is 5 to 1 then when I input the code of reverse array and print so the original array will reverse so the output 1 to 5.

A screenshot of a computer program

AI-generated content may be incorrect.

Figure 5 Screenshot of program

In this picture you will see the original number which is 5 to 1 so I use the length of array or len then print so the output of this code will tell the length of the numbers which are 5.

# Conclusion

These examples demonstrate basic array operations in programming, including accessing elements by index, update, append, reverse, length this is a simple but important to us.

**References**

Python Software Foundation. (n.d.). *Python Documentation: Lists*. Retrieved from

https://docs.python.org/3/tutorial/datastructures.html#more-on-lists

Python Software Foundation. (n.d.). *Python Documentation: Built-in Functions*. Retrieved from

https://docs.python.org/3/library/functions.html#sum