



UNIVERSITY OF CALOOCAN CITY
COMPUTER ENGINEERING DEPARTMENT



Data Structure and Algorithm

Laboratory Activity No. 5

Implementation of Arrays

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I. 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

II. 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]`

III. Results

```
# task No.1
list_numbers = [342, 343, 21, 43, 42, 23, 32, 32, 432, 4312]
total_sum = 0
for index in list_numbers:
    total_sum += index
print('total sum:', total_sum)

# task No.2
numbers = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
print('original array:', numbers)
new_numbers = [11, 12, 13, 14, 15, 16]
for new_element in new_numbers:
    numbers.append(new_element)
print('new array', numbers)

# task no.3
numbers = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
print('original array', numbers)
numbers.insert(1, 1.5)
print('result array:', numbers)

# task No.4
numbers = [5, 4, 3, 2, 1]
numbers.reverse()
print('reverse array:', numbers)

# task No.5
numbers = [5, 4, 3, 2, 1]
print('length of array:', len(numbers))

total sum: 5622
original array: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
new array [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16]
original array [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
result array: [1, 1.5, 2, 3, 4, 5, 6, 7, 8, 9, 10]
reverse array: [1, 2, 3, 4, 5]
length of array: 5
```

Figure 1 Screenshot of program

https://github.com/AmpongJKevin2/CPE-201L-DSA-2-A/blob/main/Act5/Act_5.ipynb

IV. Conclusion

In this laboratory activity I learn some basic algorithms to perform some specific tasks to solve a particular problem, the activity is break into smaller problem to teach some fundamentals about the array in python this include like append, ordering, and inserting.

For that I conclude that I gained some basic knowledge about it and some intel related to it but also it was wildy in many programs that we currently used until this day, knowing about it is essential for building reliable software.

References

- [1] Co Arthur O.. “University of Caloocan City Computer Engineering Department Honor Code,” UCC-CpE Departmental Policies, 2020.