



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

Output of the program:

```
Lab 5.py x
1 numbers = [1,2,3,4,5,6,7,8,9,10]
2 print("\n----|Numbers from 1 to 10|----")
3 print(numbers)
4
5 def num_sum(): 1 usage
6     num_sum = sum(numbers)
7     print("\nSum of numbers is: ", num_sum)
8     num_sum()
9
10 def index_num(number): 1 usage
11     print("\n----|Individual numbers:|----")
12     for i, element in enumerate(number):
13         print(f"Index {i}: {element}")
14     index_num(numbers)
15
16 def app_num(number): 1 usage
17     print("\n----|Appending a new item|----")
18     number.append(int(input("New number: ")))
19     print("\nUpdated Number: ", number)
20     app_num(numbers)
21
22 def ins_num(number): 1 usage
23     print("\n----|Inserting Number|----")
24     index = (1)
25     value = int(input("enter number:"))
26     number.insert(index, value)
27
28 numbers1 = [5,4,3,2,1]
29
30
31
32 def rev_num(numbers1): 1 usage
33     print("\n----|Reversed numbers:|----")
34     reversed = numbers1[::-1]
35     print(reversed)
36     rev_num(numbers1)
37
38 def len_num1(numbers1): 1 usage
39     print("\nLength of numbers:")
40     length = len(numbers1)
41     print(length)
42     len_num1(numbers1)
43
```

```
----|Numbers from 1 to 10|----
[1, 2, 3, 4, 5, 6, 7, 8, 9, 10]

Sum of numbers is: 55

----|Individual numbers:|----
Index 0: 1
Index 1: 2
Index 2: 3
Index 3: 4
Index 4: 5
Index 5: 6
Index 6: 7
Index 7: 8
Index 8: 9
Index 9: 10

----|Appending a new item|----
New number: 23

Updated Number: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 23]

----|Inserting Number|----
enter number:32

Updated number: [1, 32, 2, 3, 4, 5, 6, 7, 8, 9, 10, 23]

----|Reversed numbers:|----
[1, 2, 3, 4, 5]

Length of numbers:
5

Process finished with exit code 0
```

Figure 1. Screenshot of the Program

Insights:

This python program showcases the implementation of array, how each function can modify or edit the original array. This laboratory shows different functions like sum, displaying each number through indices, appending a new item, inserting a new item, reversing the array, and getting the length of the array.

IV. Conclusion

In conclusion, It greatly helps me practice and enhance my array knowledge and practical skills. I will be able to implement and use the skills that I learned to create a program in database algorithm and structure. I can also use this in my future work in the Computer Engineering field.