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

```
import array as arr
numbers = arr.array('i', [9, 11, 5, 26, 98, 23, 6, 24, 77, 3])

print("Array Items", list(numbers))
print("First Item = " , numbers[0])
print("Last Item = ", numbers[-1])

total_sum = sum(numbers)
print("Total Sum = ", total_sum)
```

```
Array Items [9, 11, 5, 26, 98, 23, 6, 24, 77, 3]
First Item =  9
Last Item =  3
Total Sum =  282
```

Figure 1. Screenshot of program

This program creates an array of numbers and shows some details about it. First, it imports the `array` module and makes an array called `numbers` with 10 integers like 9, 11, 5, 26, 98, 23, 6, 24, 77, and 3. The program then prints the whole list of numbers, the first number in the list, and the last number in the list. After that, it adds up all the numbers using the `sum()` function and prints the total. In the output, you can see the full list, the first number (9), the last number (3), and the total sum of all numbers (282).

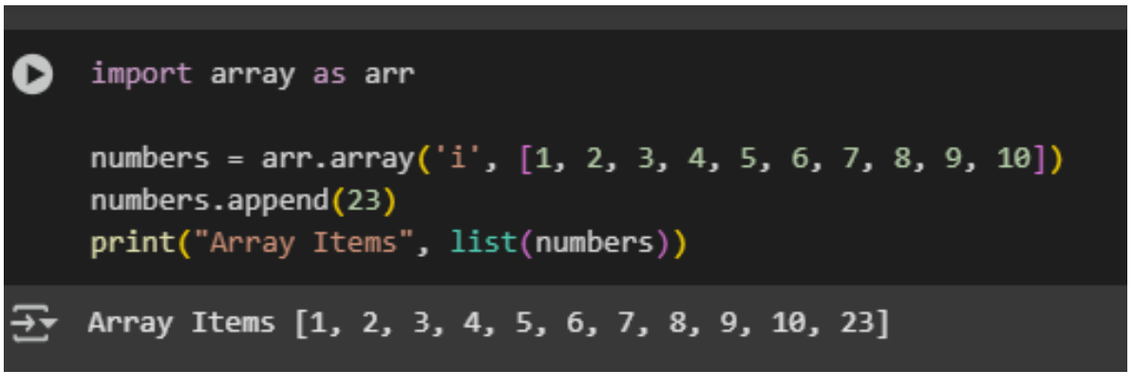

Figure 2. Screenshot of program

This program creates an array of numbers from the given original numbers = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]. It used “number.append” to add other elements to the last index of an array, then print the array to show the added elements. For example, in figure 2, the element that was added to the list is 23, then the output of the array is [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 23].

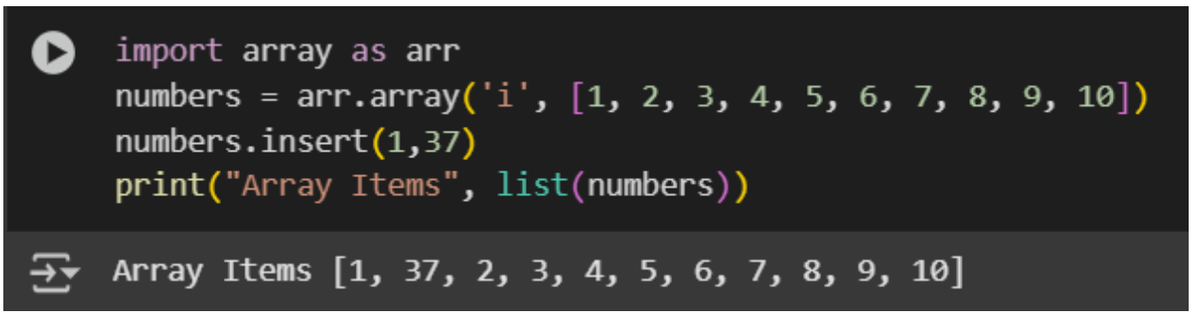

Figure 3. Screenshot of program

This program creates an array of numbers from the given original numbers = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]. It used “number.insert’ to add other elements in specific indexes, then print the array to show the added elements. For example, in figure 3, the element that was added to the list is 23 in index 1, then the output of the array is [1, 37, 2, 3, 4, 5, 6, 7, 8, 9, 10,]

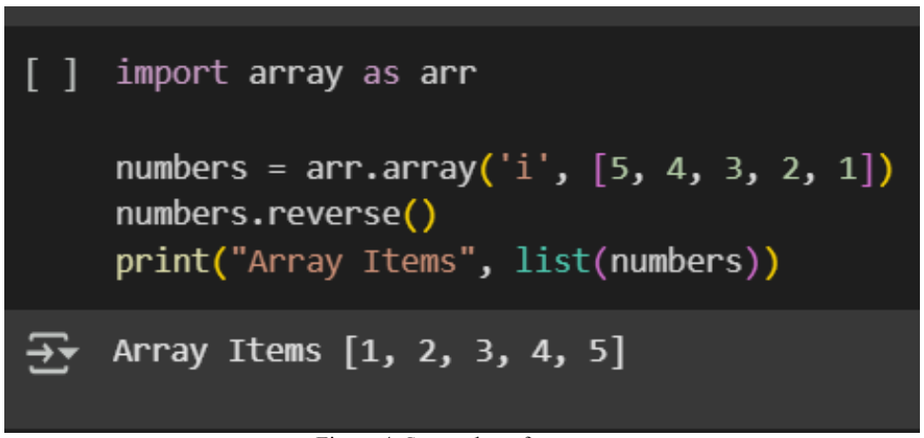

Figure 4. Screenshot of program

This program creates an array of numbers from the given original numbers = [5, 4, 3, 2, 1]. It used the function numbers.reverse() to flip the order of the elements in the array, then printed the result. For example, in figure 4, after reversing, the output of the array becomes [1, 2, 3, 4, 5].

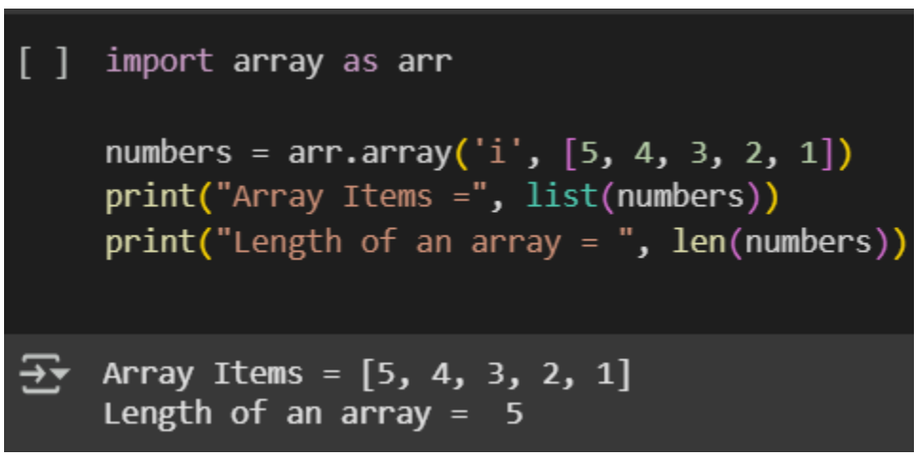

Figure 5. Screenshot of program

This program creates an array of numbers using the array module. The array is defined as numbers = [5, 4, 3, 2, 1] with type 'i', which means it stores integers. The program then prints the array items by converting it into a Python list, showing all the elements inside. After that, it prints the length of the array using the len() function. For example, in the figure 5, the array elements are [5, 4, 3, 2, 1] and the length of the array is 5.

IV. Conclusion

In this laboratory, I learned how to use arrays in Python and perform different operations with them. I was able to create an array of integers, display its elements, and access each item through its index. I also practiced adding a new element at the end of the array, inserting an item in a specific position, reversing the order of elements, and finding the total number of items. This activity gave me a better understanding of how arrays work as a data structure and how they can be applied in writing simple Python programs.

References

[1] GeeksforGeeks, “Python Arrays,” *GeeksforGeeks*, Jul. 28, 2025. https://www.geeksforgeeks.org/python/python-arrays/

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[4] “Python List insert().” https://www.programiz.com/python-programming/methods/list/insert

[5] GeeksforGeeks, “Python List reverse(),” *GeeksforGeeks*, Apr. 25, 2025. https://www.geeksforgeeks.org/python/python-list-reverse/

[6] “W3Schools.com.” https://www.w3schools.com/python/ref_func_len.asp