Data Structure and Algorithm

Laboratory Activity No. 4

Arrays

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August, 09, 2025

# 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
* Solve programming problems using dynamic memory allocation, arrays and pointers

# Methods

Jenna’s Grocery

A list of grocery items

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Jenna wants to buy the following fruits and vegetables for her daily consumption. However, she needs to distinguish between fruit and vegetable, as well as calculate the sum of prices that she has to pay in total.

Problem 1: Create a class for the fruit and the vegetable classes. Each class must have a constructor, deconstructor, copy constructor and copy assignment operator. They must also have all relevant attributes (such as name, price and quantity) and functions (such as calculate sum) as presented in the problem description above.

Problem 2: Create an array GroceryList in the driver code that will contain all items in Jenna’s Grocery List. You must then access each saved instance and display all details about the items.

Problem 3: Create a function TotalSum that will calculate the sum of all objects listed in Jenna’s Grocery List.

Problem 4: Delete the Lettuce from Jenna’s GroceryList list and de-allocate the memory assigned.

# Results

A screen shot of a computer program

AI-generated content may be incorrect.

Figure 1 Screenshot of program

A screenshot of a computer program

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Figure 2 Screenshot of program

A screenshot of a computer program

AI-generated content may be incorrect.

Figure 3 Screenshot of program

A screenshot of a computer program

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Figure 4 Screenshot of program

Conclusion

The laboratory activity demonstrated the practical application of arrays in solving real-world problems through object-oriented programming. By creating distinct classes for fruits and vegetables, implementing constructors and memory management functions, and organizing items in an array, the exercise reinforced key concepts in data structures and dynamic memory allocation. The tasks also highlighted the importance of modular design and efficient data handling, especially in calculating totals and managing memory. Overall, the activity provided a clear understanding of how arrays and object-oriented principles can be used to build structured and functional programs.

**References**

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

[2] Google, “Welcome to Colab,” [Online]. Available: https://colab.research.google.com. . [Accessed: 09-Aug-2025].