



Department of Electrical and Software Engineering
Schulich School of Engineering

ENSF 694 - Principles of Software Development II
Summer 2023

Lab 4 – July 10, 2023

Topic: Arrays, Linked Lists

- All codes must be complete and compile without any errors.
- The codes should work for not only the given sample inputs but also any inputs of the same data types.
- **Submission: github link of the codes in the d2l dropbox 'Lab#04_Jul10' and push your code in the github classroom repository**
 - Go to this link - <https://classroom.github.com/a/Cco0Bv0M>
 - Refresh and accept the Lab4 link
 - Clone the repository and then push your code
 - Then submit the github link to the d2l dropbox 'Lab#04_Jul10'

Lab Tasks

20 marks - 10 for Q1 + 10 for Q2

Q1.

1. Create a string array of size 10 and insert names of 10 fruits (not user input).
2. Show the original array and array size.
3. Copy the original array into another to access original array at different steps.
4. Then insert a new fruit name (either from the user or directly assign in a variable) at index 3 of the array by shifting later elements and
 - a. show the current array (new fruit name at index 3, but array size still 10) and array size to display that the last element of original array is missing,
 - b. create an array of size 11, copy the original array into it, insert the new fruit at index 3 by shifting later elements, show the array of size 11 with the new fruit at index 3 and array size.
5. Now delete the fruit from index 6 of original array and
 - a. show the current array (array size still 10, after deleting the value at index 6) and array size,
 - b. show an array of size 9 with the updated fruit names after the deletion and array size.

(Use the insertion and deletion format that used shifting elements from the lecture)

Q2. (Don't use the java.util.LinkedList class for this)

1. Create a linked list of string.
2. Add names of 10 fruits in the linked list using the addNode logic from the lecture.
3. Display the original linked list.
4. Find the size of the link list (write your own code to count number of nodes while traversing the list from the beginning).

Sample Run of the Code:

```
Original Array: [Apple, Avocado, Apricot, Berry, Banana, Orange, Peach, Kiwi, Mango, Plum]
Original Array Size: 10

New Fruit: Grape

After Insertion at index 3 Array: [Apple, Avocado, Apricot, Grape, Berry, Banana, Orange, Peach, Kiwi, Mango]
After Insertion at index 3 Array Size: 10

After Insertion at index 3 of new Array: [Apple, Avocado, Apricot, Grape, Berry, Banana, Orange, Peach, Kiwi, Mango, Plum]
After Insertion at index 3 of new Array Size: 11

Deleted Fruit: Peach

After deleting from index 6 of Array: [Apple, Avocado, Apricot, Berry, Banana, Orange, Kiwi, Mango, Plum, Plum]
After deleting from index 6 of Array Size: 10

After deleting from index 6 of new Array: [Apple, Avocado, Apricot, Berry, Banana, Orange, Kiwi, Mango, Plum]
After deleting from index 6 of new Array Size: 9

Nodes of singly linked list:
Apple Avocado Apricot Berry Banana Orange Peach Kiwi Mango Plum
Linked List Size: 10
```