



UNIVERSITY OF CALOOCAN CITY
COMPUTER ENGINEERING DEPARTMENT



Data Structure and Algorithm

Laboratory Activity

Skill Test

Submitted by:
Ruperto, April Anne A.

Instructor:
Engr. Maria Rizette H. Sayo

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I. Objectives

This activity aims to implement the principles and techniques in:

- Wring a Python program using array
- Writing a program that will append each character of your full name and transversing each character.
- Save your python program as Skill-Test in your Colab and Github

II. Discussion

Array is a linear data structure where all the elements are arranged sequentially. It is a collection of similar data elements, and each element can be accessed using an index starting from 0.

III. Materials and Equipment

- Desktop Computer
- Windows Operating System
- Google Colab

IV. Procedure

Array

```
Python 3.10.6 Shell
# Python program to implement Array
import array

def display(arr):
    print("Name: ", list(arr))

def transverse(arr):
    print("Transversing Array")
    for i, element in enumerate(arr):
        print(f"Index {i}: {element}")

def append(arr):
    append_arr = input("Insert Element: ")
    if len(append_arr) == 1:
        arr.append(append_arr)
        print("Element appended successfully.")
    else:
        print("Invalid input. Please enter a single character.")

def insert(arr):
    insert_arr = input("Insert Element: ")
    insert_position = int(input("Insert Position: "))
    arr.insert(insert_position, insert_arr)
    print("Element inserted successfully.")

def length(arr):
    print(len(arr))

def delete(arr):
    delete_position = int(input("Enter position to delete: "))
    if 0 <= delete_position < len(arr):
        del arr[delete_position]
        print(f"Element at position {delete_position} deleted successfully.")
    else:
        print("Invalid position.")

def main():
    arr = array.array('u', [])
    print("Name: ")

    while True:
        print("\nMenu")
        print("1. Display")
        print("2. Transverse Elements")
        print("3. Add Elements")
        print("4. Insert Elements")
        print("5. Number of Elements")
        print("6. Delete Element")
        print("7. Exit")
        choice = int(input("Enter your choice (1-7): "))

        if choice == 1:
            display(arr)
        elif choice == 2:
            transverse(arr)
        elif choice == 3:
            append(arr)
        elif choice == 4:
            insert(arr)
        elif choice == 5:
            length(arr)
        elif choice == 6:
            delete(arr)
        elif choice == 7:
            print("Exiting Program...")
            break
        else:
            print("Invalid Choice. Please try again.")

if __name__ == "__main__":
    main()
```

Please refer to this link: [CPE-201L-DSA-2-A/Skill_Test/Skill_Test.ipynb](#) at main · Ruperto-April-Anne/CPE-201L-DSA-2-A

In this program, I use an array.array format where 'u' represents the unicode character. Importing the required array module provides a way to create an array. Each function such as display, transverse, append, insert, length, and delete allow me to modify the elements within the array list. In the main function, it initializes an empty Unicode character array "arr". It displays the words "Name: " at the beginning but it doesn't display anything unless one is added. The menu allows then user to choose operations and accepts input as a number from 1 to 7 to call its corresponding functions. Then, it execute user's selected function and break out of the loop once the user choose the input number 7.

V. Output

```
Name:

Menu
1. Display
2. Tranverse Elements
3. Add Elements
4. Insert Elements
5. Number of Elements
6. Delete Element
7. Exit
Enter your choice (1-7): 3
Insert Element: A
Element appended successfully.

Menu
1. Display
2. Tranverse Elements
3. Add Elements
4. Insert Elements
5. Number of Elements
6. Delete Element
7. Exit
Enter your choice (1-7): 3
Insert Element: p
Element appended successfully.

Menu
1. Display
2. Tranverse Elements
3. Add Elements
4. Insert Elements
5. Number of Elements
6. Delete Element
7. Exit
Enter your choice (1-7): 3
Insert Element: i
Element appended successfully.

Menu
1. Display
2. Tranverse Elements
3. Add Elements
4. Insert Elements
5. Number of Elements
6. Delete Element
7. Exit
Enter your choice (1-7): 4
Insert Element: r
Insert Position: 2
Element inserted successfully.

Menu
1. Display
2. Tranverse Elements
3. Add Elements
4. Insert Elements
5. Number of Elements
6. Delete Element
7. Exit
Enter your choice (1-7): 3
Insert Element: l
Element appended successfully.

Menu
1. Display
2. Tranverse Elements
3. Add Elements
4. Insert Elements
5. Number of Elements
6. Delete Element
7. Exit
Enter your choice (1-7): 1
Name: ['A', 'p', 'r', 'i', 'l']

Menu
1. Display
2. Tranverse Elements
3. Add Elements
4. Insert Elements
5. Number of Elements
6. Delete Element
7. Exit
Enter your choice (1-7): 3
Insert Element: n
Element appended successfully.

Menu
1. Display
2. Tranverse Elements
3. Add Elements
4. Insert Elements
5. Number of Elements
6. Delete Element
7. Exit
Enter your choice (1-7): 3
Insert Element: A
Element appended successfully.

Menu
1. Display
2. Tranverse Elements
3. Add Elements
4. Insert Elements
5. Number of Elements
6. Delete Element
7. Exit
Enter your choice (1-7): 3
Insert Element: n
Element appended successfully.

Menu
1. Display
2. Tranverse Elements
3. Add Elements
4. Insert Elements
5. Number of Elements
6. Delete Element
7. Exit
Enter your choice (1-7): 3
Insert Element: e
Element appended successfully.

Menu
1. Display
2. Tranverse Elements
3. Add Elements
4. Insert Elements
5. Number of Elements
6. Delete Element
7. Exit
Enter your choice (1-7): 3
Insert Element: e
Element appended successfully.

Menu
1. Display
2. Tranverse Elements
3. Add Elements
4. Insert Elements
5. Number of Elements
6. Delete Element
7. Exit
Enter your choice (1-7): 3
Insert Element: r
Element appended successfully.

Menu
1. Display
2. Tranverse Elements
3. Add Elements
4. Insert Elements
5. Number of Elements
6. Delete Element
7. Exit
Enter your choice (1-7): 3
Insert Element: r
Element appended successfully.

Menu
1. Display
2. Tranverse Elements
3. Add Elements
4. Insert Elements
5. Number of Elements
6. Delete Element
7. Exit
Enter your choice (1-7): 3
Insert Element: t
Element appended successfully.
```

```
Menu
1. Display
2. Tranverse Elements
3. Add Elements
4. Insert Elements
5. Number of Elements
6. Delete Element
7. Exit
Enter your choice (1-7): 3
Insert Element: o
Element appended successfully.

Menu
1. Display
2. Tranverse Elements
3. Add Elements
4. Insert Elements
5. Number of Elements
6. Delete Element
7. Exit
Enter your choice (1-7): 1
Name: ['A', 'p', 'r', 'l', 'l', ' ', 'A', 'n', 'n', 'e', ' ', 'R', 'u', 'p', 'e', 'r', 't', 'o']

Menu
1. Display
2. Tranverse Elements
3. Add Elements
4. Insert Elements
5. Number of Elements
6. Delete Element
7. Exit
Enter your choice (1-7): 5
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Menu
1. Display
2. Tranverse Elements
3. Add Elements
4. Insert Elements
5. Number of Elements
6. Delete Element
7. Exit
Enter your choice (1-7): 2
Transversing Array
Index 0: A
Index 1: p
Index 2: r
Index 3: l
Index 4: l
Index 5:
Index 6: A
Index 7: n
Index 8: n
Index 9: e
Index 10:
Index 11: R
Index 12: u
Index 13: p
Index 14: e
Index 15: r
Index 16: t
Index 17: o

Menu
1. Display
2. Tranverse Elements
3. Add Elements
4. Insert Elements
5. Number of Elements
6. Delete Element
7. Exit
Enter your choice (1-7): 7
Exiting Program...
```

Figure 1 – 4: Screenshot of the Output

VI. Conclusion

Lab Activity Rubric							
Criteria	Ratings						Pts
 SO 7 PI 1 Student Outcome 7.1 Acquire and apply new knowledge from outside sources. threshold: 4.8 pts	6 pts Excellent Educational interests and pursuits exist and flourish outside classroom requirements, knowledge and/or experiences are pursued independently and applies knowledge learned into practice	5 pts Good Educational interests and pursuits exist and flourish outside classroom requirements, knowledge and/or experiences are pursued independently	4 pts Satisfactory Look beyond classroom requirements, showing interest in pursuing knowledge independently	3 pts Unsatisfactory Begins to look beyond classroom requirements, showing interest in pursuing knowledge independently	2 pts Poor Relies on classroom instruction only	1 pts Very Poor No initiative or interest in acquiring new knowledge	6 pts
 SO 7 PI 2 Student Outcome 7.2 Learn independently threshold: 4.8 pts	6 pts Excellent Completes an assigned task independently and practices continuous improvement	5 pts Good Completes an assigned task without supervision or guidance	4 pts Satisfactory Requires minimal guidance to complete an assigned task	3 pts Unsatisfactory Requires detailed or step-by-step instructions to complete a task	2 pts Poor Shows little interest to complete a task independently	1 pts Very Poor No interest to complete a task independently	6 pts
 SO 7 PI 3 Student Outcome 7.3 Critical thinking in the broadest context of technological change threshold: 4.8 pts	6 pts Excellent Synthesizes and integrates information from a variety of sources; formulates a clear and precise perspective; draws appropriate conclusions	5 pts Good Evaluate information from a variety of sources; formulates a clear and precise perspective.	4 pts Satisfactory Analyze information from a variety of sources; formulates a clear and precise perspective.	3 pts Unsatisfactory Apply the gathered information to formulate the problem	2 pts Poor Gather and summarized the information from a variety of sources but failed to formulate the problem	1 pts Very Poor Gather information from a variety of sources	6 pts
 SO 7 PI 4 Student Outcome 7.4 Creativity and adaptability to new and emerging technologies threshold: 4.8 pts	6 pts Excellent Ideas are combined in original and creative ways in line with the new and emerging technology trends to solve a problem or address an issue.	5 pts Good Ideas are creative and adapt the new knowledge to solve a problem or address an issue	4 pts Satisfactory Ideas are creative in solving a problem, or address an issue	3 pts Unsatisfactory Shows some creative ways to solve the problem	2 pts Poor Shows initiative and attempt to develop creative ideas to solve the problem	1 pts Very Poor Ideas are copied or restated from the sources consulted	6 pts
Total Points: 24							