Data Structure and Algorithm

Laboratory Activity

Skill Test

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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

Please refer to this link:

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:
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: 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:
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: u
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: 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: 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', 'i', '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: i
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