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CS 5393-002

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Static & Dynamic Arrays:

-Goal: To make a static and dynamic array, as well as functions for their manipulation.

-Approach: I decided to use a pointer for my dynamic array. This way, one function would work for both the static and the dynamic operations. Then, I made code for each function and designed the main method to display their usage.

-Output:

```
How long should the dynamic array be? 25
Static Array:
0
0, 1
0, 1, 2
0, 1, 2, 3
0, 1, 3
3 @ 2
0, 1
3 not found
Dynamic Array:
0
0, 1
0, 1, 2
0, 1, 2, 3
0, 1, 3
3 @ 2
0, 1
3 not found

C:\Users\ctlus\source\repos\DS_Projects\x64\Debug\Project_1-1.exe (process 47588) exited with code 0.
Press any key to close this window . . .|
```

Multidimensional Arrays:

-Goal: Create a program simulating a basic spreadsheet

-Approach: I decided to allow for user input about the size of the array by using pointers (dynamic arrays). Then, I prompted the user for the information in each cell. Then, I summed and averaged each row and column, found the max and min values in the entire spreadsheet, and created a search function for locations of values.

-Output:

```
How many rows would you like your spreadsheet to be?
5
How many columns would you like your spreadsheet to be?
5
Enter the val for 1,1 1
Enter the val for 1,2 2
Enter the val for 1,3 3
Enter the val for 1,4 4
Enter the val for 1,5 5
Enter the val for 2,1 2
Enter the val for 2,2 4
Enter the val for 2,3 6
Enter the val for 2,4 8
Enter the val for 2,5 10
Enter the val for 3,1 3
Enter the val for 3,2 6
Enter the val for 3,3 9
Enter the val for 3,4 12
Enter the val for 3,5 15
Enter the val for 4,1 4
Enter the val for 4,2 8
Enter the val for 4,3 12
Enter the val for 4,4 16
Enter the val for 4,5 20
Enter the val for 5,1 5
Enter the val for 5,2 10
Enter the val for 5,3 15
Enter the val for 5,4 20
Enter the val for 5,5 25
Spreadsheet made with 5 rows and 5 columns.
1      2      3      4      5
2      4      6      8      10
3      6      9      12     15
4      8      12     16     20
5      10     15     20     25
Value of Row 1 = 15
Avg of Row 1 = 3
Value of Row 2 = 30
Avg of Row 2 = 6
Value of Row 3 = 45
Avg of Row 3 = 9
Value of Row 4 = 60
Avg of Row 4 = 12
Value of Row 5 = 75
Avg of Row 5 = 15
Value of Column 1 = 15
Avg of Column 1 = 3
Value of Column 2 = 30
Avg of Column 2 = 6
Value of Column 3 = 45
Avg of Column 3 = 9
Value of Column 4 = 60
Avg of Column 4 = 12
Value of Column 5 = 75
Avg of Column 5 = 15
Max val: 25
Min val: 1
What value needs finding:
16
First finding @ 3,3

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Press any key to close this window . . .|
```

Linked Lists:

-Goal: Create single, double, and circular linked lists with insert delete, and display functions

-Approach: I decided to create a node struct to group related information. Then, I made a class for each type of linked list. Then, I made a main method to show the operations on each list type. Note: I originally created both a header file and a .cpp file for each class, but as per instructions I combined them. I ran it and it worked, but I apologize if anything is formatted strangely.

-Output:

```
Enter a string: Here is a string!
Singularly Linked List Output:      Here is a string!
Doubly Linked List Reverse Output:  !gnirts a si ereH
Circularly Linked List Double Output: Here is a string!Here is a string!

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Press any key to close this window . . .
```

References

<https://chatgpt.com/c/66ec9b73-cdd0-8012-a7ec-61fda9bf03c9>

<https://chatgpt.com/g/g-2DQzU5UZI-code-copilot>