Assignment W13 Documentation

1. Study Plan:

The topic chosen for this program is Array-Based lists. I chose this topic to learn more on the subject by trying it from scratch. I wanted to learn more on this topic due to having some overlap with my java class that used a similar setup. I started to understand more on how to implement a dynamic list structure and manage memory.

2. What was learned:

An array-based list is a data structure that uses a dynamically allocated array to store. Elements. It supports fast random access and can grow or shrink as needed. Surprisingly, the difficult part was with the checks for user input. I ran into an error in which the user did not type a valid input into the menu which caused unintended results with the array. Checks had to be added to prevent this.

3. Implementation:

The algorithm is implemented using two classes: Array and ArrayList. The user interacts with the list through a menu-driven console in main.cpp. The key files and functions are as such. In main.hpp, Array<T> is used to handle dynamic memory for a raw array, including copy and assignment. ArrayList<T> provides methods like add, remove, get, set, print, and manages resizing the underlying array. Main.cpp presents a menu to the user for adding, getting, setting, removing, and printing elements, as well as checking the list size. Say for a sample, the ArrayList menu would be printed. The user is presented with add, get, set and remove element options along with print list, and get size. The user decides to add “apple” at index 0 and “banana” at index 1. Printing the list shows both elements and removing index 0 removes apple from the list. Getting index 1 would return banana and setting the element would give the user the option to change an element already created.

4. Reflection:

What I found most interesting was modifying my code which originally had a predetermined list to include user input. We had previously done a program like this in class so I wanted to change things up a little, and decided to have a program that the user would have influence with. I would likely use this if I had to build a program that would require an efficient list such as a contact manager. I would choose this topic again as I feel there is still more to learn about here.