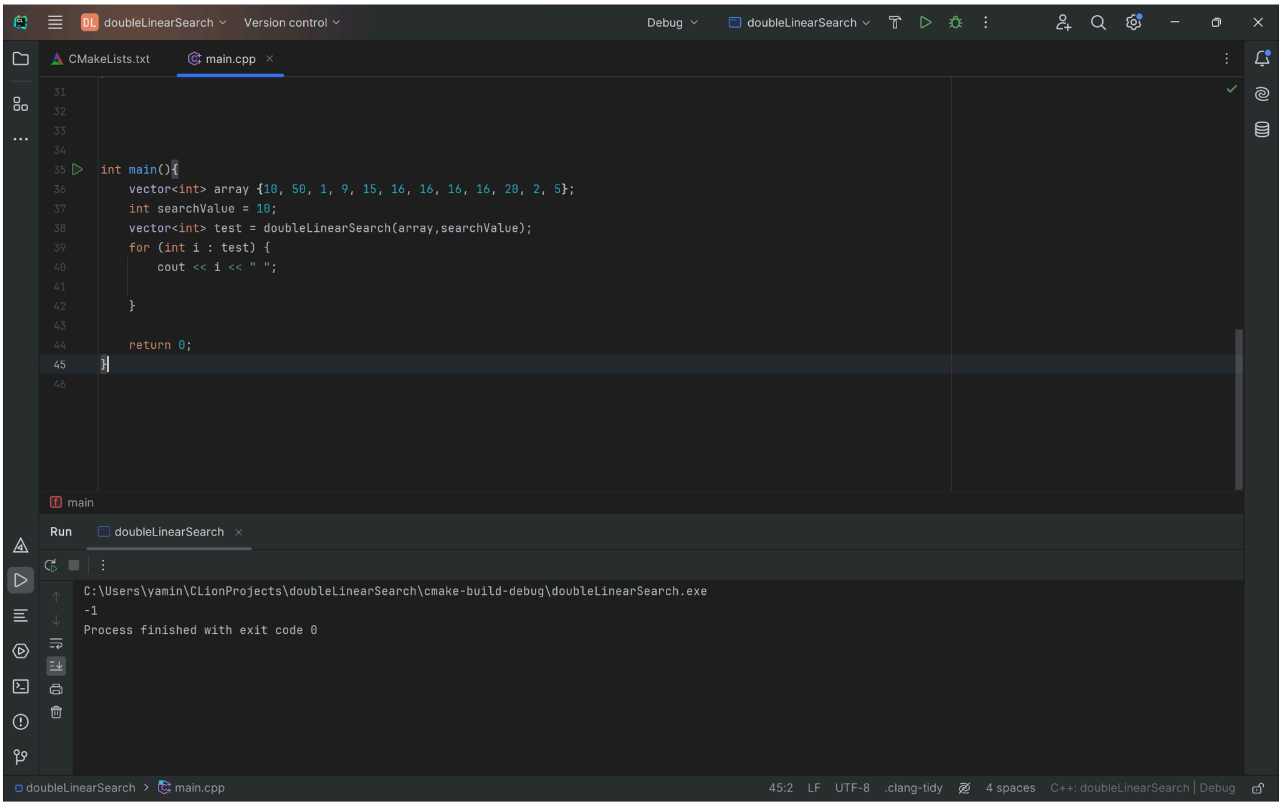
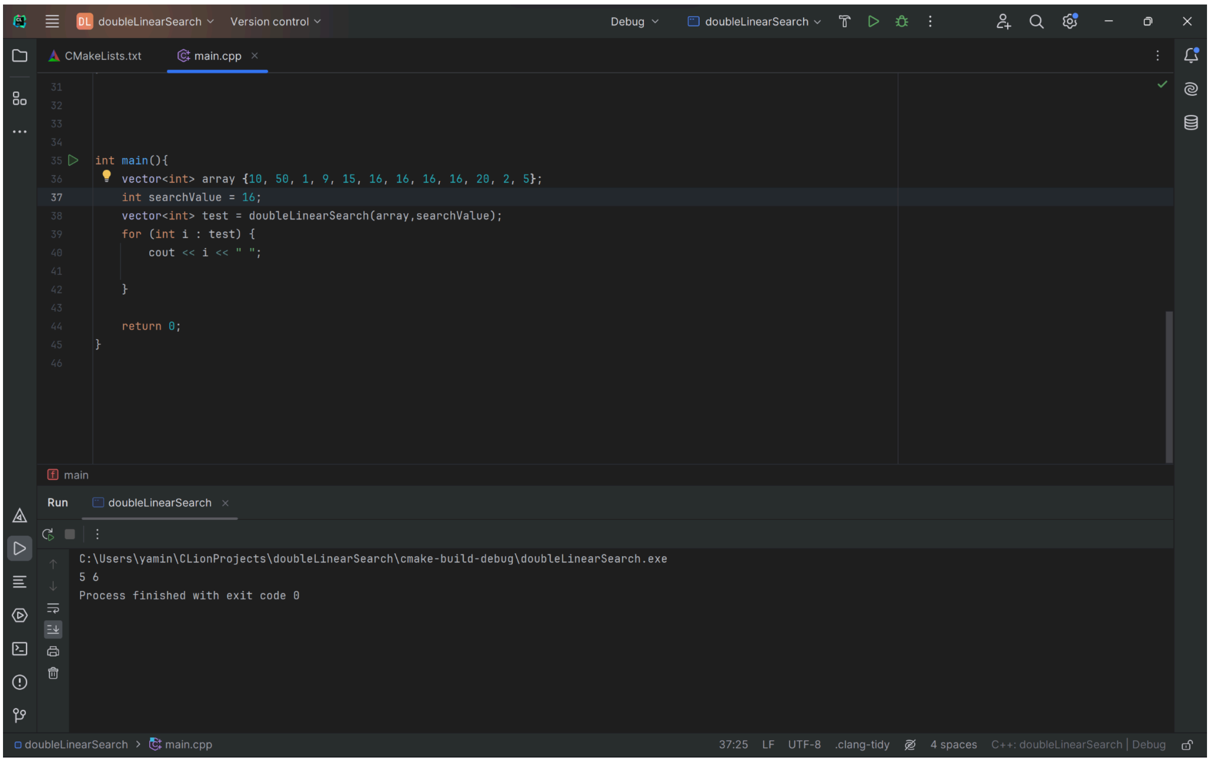
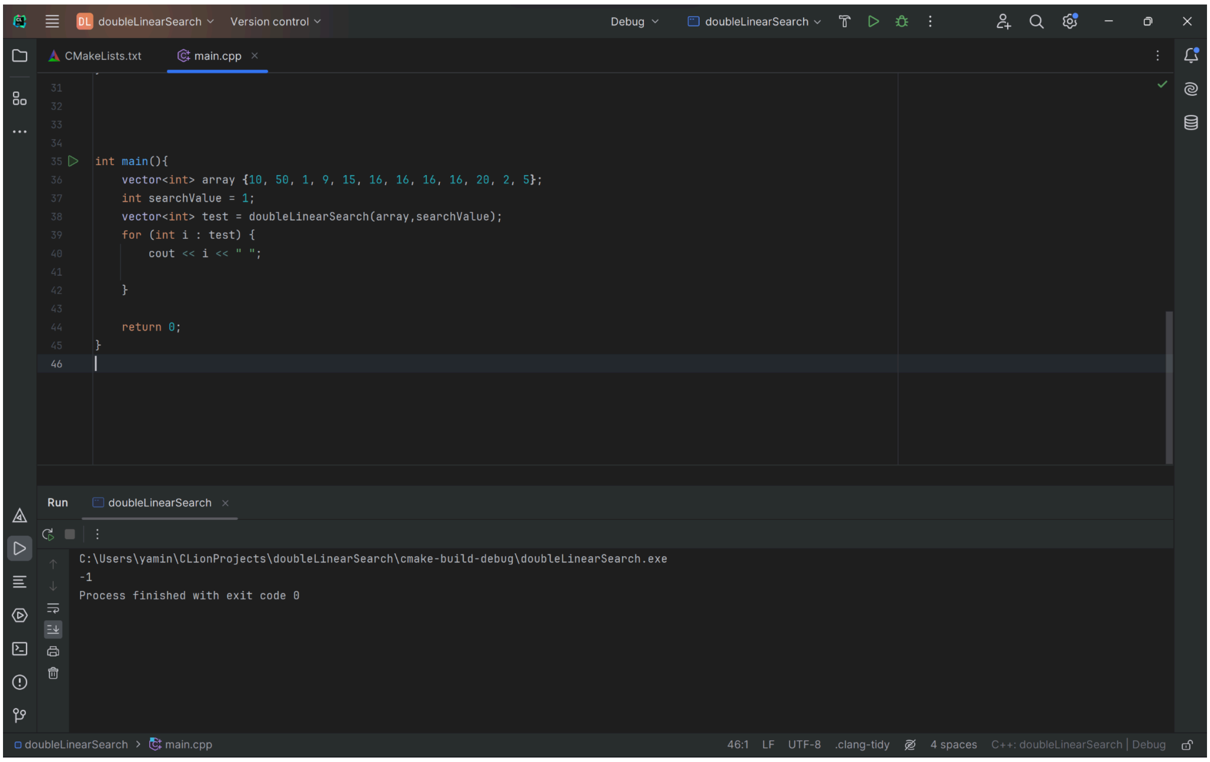
Deliverable 1:
Pseudo code:

Function doubleLinearSearch(array, searchValue){
    //need a vector array to store the first two elements
    Initialize an empty vector variable named search_findings
    //need a variable to store the number of elements found
    Initialize a int variable named index_found to 0
    //need to loop through over each element. Stop the loop when 2 elements are found. And add these 2 elements to the search_findings vector.
    //need a if statement where if 2 elements are not found, it will add -1 to search_findings.
    Initialize a loop to iterate over each elements, index pair in the array.
        If the current element value is equal to search value
            Add the index of the current element to search_findings.
            And increment the index found by 1.
            If index_found = 2
            Break out of the loop.
        If index_found is less than 2:
        Clear the search_findings array and
        Add -1 to search_finding
    Return search_findings.
}

Deliverable 2:







Deliverable 3:

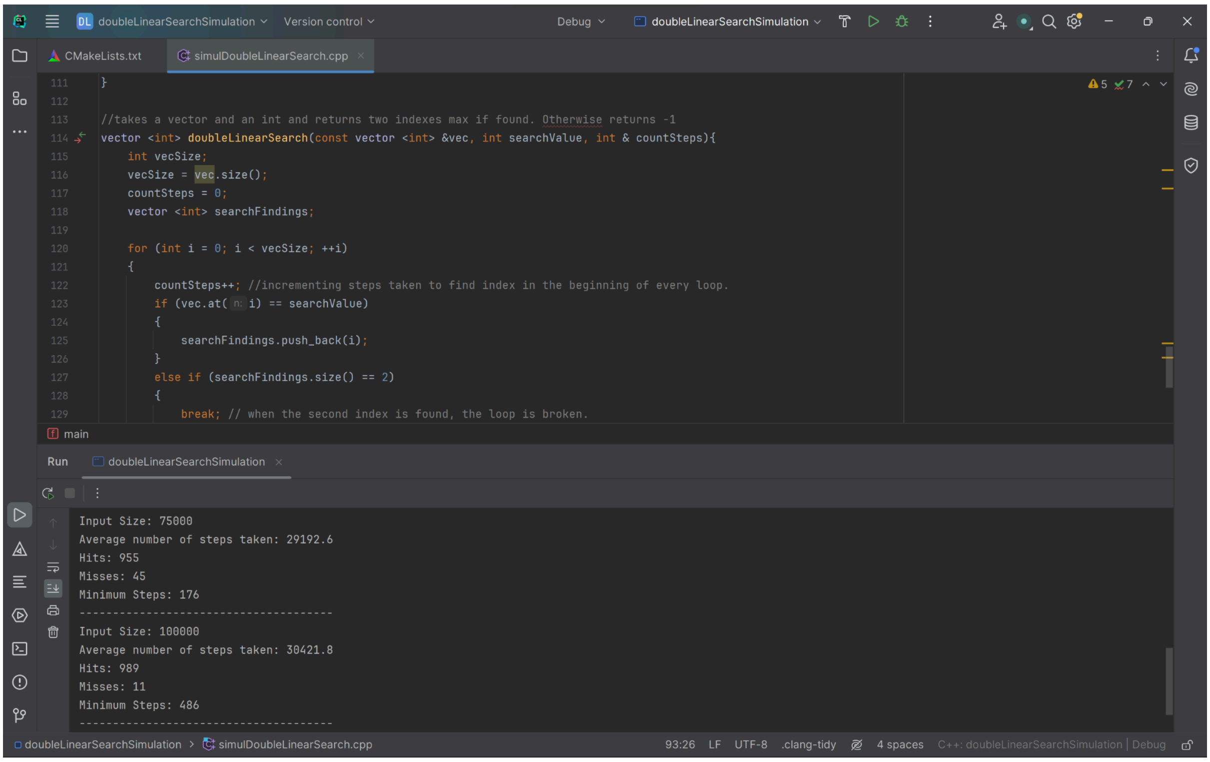
1. Creating an empty vector takes constant time O(1).
2. Inititalizing a variable takes constant time O(1).
3. The while loop iterates through each element of the array once, so its complexity depends on the size of the input array, denoted by n. The worst case scenario is that

the search value was not found or only one value was found. In this case, the while loop runs through all elements of the array, giving it a complexity of O(N).

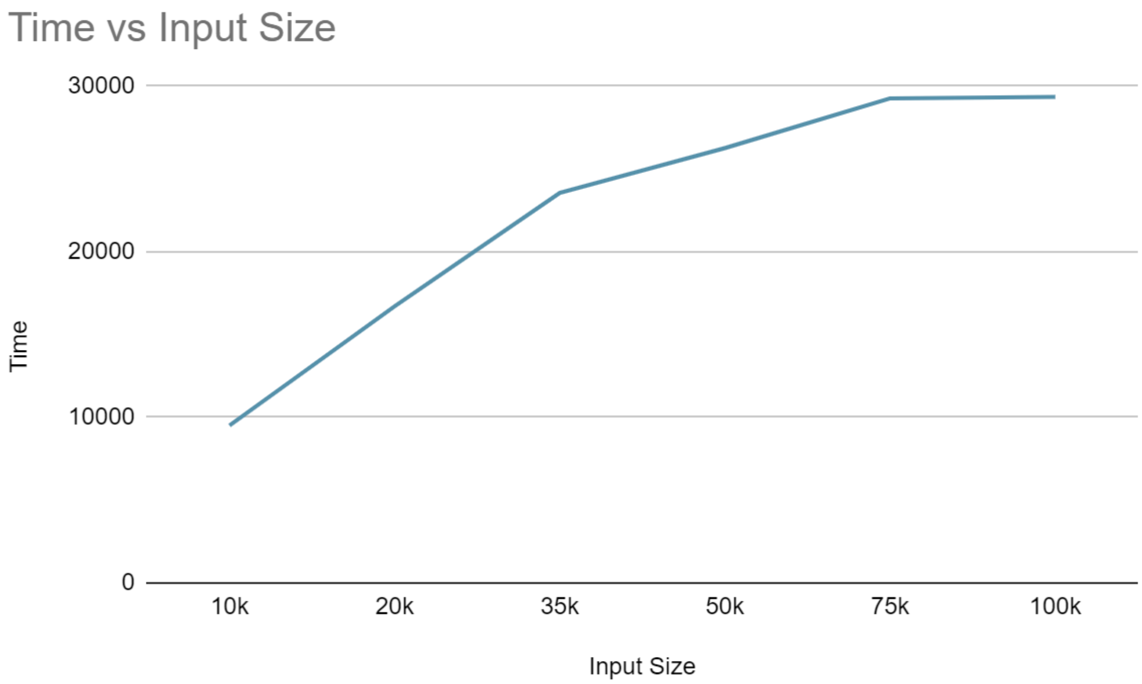
4. Inside the loop, the operation of checking whether the array element is equal to the search value takes constant time O(1)
5. Pushing an element into search_findings, incrementation of index_found, checking the number of index found is equal to 2 or not also takes constant time O(1).
6. Finally clearing the search findings vector takes linear timeO(n), where n is the number of elements in the vector. However, only max 2 elements will be cleared. It can be considered constant time O(1)

   So, the overall time complexity: T(n) = O(n)

Deliverable 4:



Input Size	Hits	Misses	Min Steps	Average Steps
10k	147	853	356	9508.39
20k	370	630	621	16708.6
35k	702	298	230	23564.9
50k	844	156	948	26260.8
75k	955	45	176	29269.6
100k	989	11	486	29347.5



Deliverable 5:
The graph illustrating the correlation between input size and time exhibits a behavior similar to logarithmic growth. With an increase in input size, the corresponding time taken also increases, but at a slower rate. This resemblance to a logarithmic trend suggests that the algorithm's time complexity adheres to O(log n), where n denotes the input size.

In the realm of Big O notation, O(log n) denotes logarithmic time complexity, indicating that the algorithm's runtime grows logarithmically with the size of the input. Consequently, if the input size doubles, the time required for the algorithm's execution increases only logarithmically.

The notable similarity between the depicted graph and the expected behavior of O(log n) time complexity implies that the algorithm's efficiency conforms to O(log n).