

Brute force method analysis:

Time complexity:

In the brute force method, the array is looped through, which takes $O(n)$ time) for each element in the array, n times. Therefore, the time complexity is $O(n^2)$.

Space complexity:

All the sorting is done on the original data set, therefore the space complexity is $O(1)$.

Binary search tree method analysis:

Time complexity:

Searching for an element in a binary tree requires traversal through all elements, this takes $O(n)$ time.

Space complexity:

This method requires space to be allocated for the tree in $O(n)$.