Search and Sort Techniques

Search:

I used a binary search algorithm for this program which can be found in the Directory class. This method accepts an ArrayList of files and a String with the name of the file to be searched. First it defines the left and right indices to be 0 and the length of the arraylist respectively. Then it loops until the left index is greater than the right index. Within the loop, a middle index is created and initialized. The value of the name of the middle index is compared to the search term and then the left and right indices are incremented as necessary until the middle index holds the value of the search term. If this is never the case then the method returns -1 because the element was not found. The runtime of this method is O(logn) but the ArrayList must be sorted for it to work correctly.

Sort:

I used a bubble sort for this program in the Directory class. This method accepts and ArrayList of files. It has two nested loops and sweeps through the list in order and swaps the elements if the compareTo method returns a value greater than 0. After iterating through the list, the updated list is returned. The runtime of this method is O(n^2).