

Appendix B

Lab Assignment: Searching and Sorting Arrays

Part 1:

Create a List Utility class that includes in the class the following sorts:

Bubble, Selection, Insertion

It must also include the following searches:

Sequential, Binary

(You can have students write these sorts and searches so that they work with objects, or you can have them demonstrate the idea with a simple data type like numbers. Sometimes it's nice to have students do the simple data types first, then have them change the code to work for objects later.)

Part 2:

Using their list utility class, students need to put data into a list. (This can be done by file or keyboard input, or they can just generate random data within the program.)

Students will be required to demonstrate that all their sorts and searches work. An example output follows (assuming they used a random number generator to get their data):

Original List contains:

12 6 2 8 34

****Demonstrating Linear Search with an UNSORTED list*****

Search for 6 using a linear search:

Comparing with 12

Comparing with 6

Value found at index 1.

*****Demonstrating Binary Search with an UNSORTED list*****

Search for 6 using a binary search with an UNSORTED list

Comparing with 2, search item is greater

Comparing with 8, should be search item

Search item not found!

*****Sorting List*****

Have students store the original list and make new lists after they sorted the original list.

~~~~~Sorting with a Bubble Sort

*\*\*\* Here you can have them print out every comparison or pass.*

~~~~~Sorting with a Selection Sort

**** Here you can have them print out every comparison or pass.*

~~~~~Sorting with an Insertion Sort

*\*\*\* Here you can have them print out every comparison or pass.*

\*\*\*\*\*Searching after the Sorting\*\*\*\*\*

Sorted List contains:

2 6 8 12 34

\*\*\*\*\*Demonstrating Linear Search on SORTED list\*\*\*\*\*

Search for 6 using a linear search:

Comparing with 12

Comparing with 6

Value found at index 1.

\*\*\*\*\*Demonstrating Binary Search with a SORTED list\*\*\*\*\*

Search for 6 using a binary search with a SORTED list

Comparing with 8, search item is smaller

Comparing with 2, item is greater

Comparing with 6, item is found at index [1]