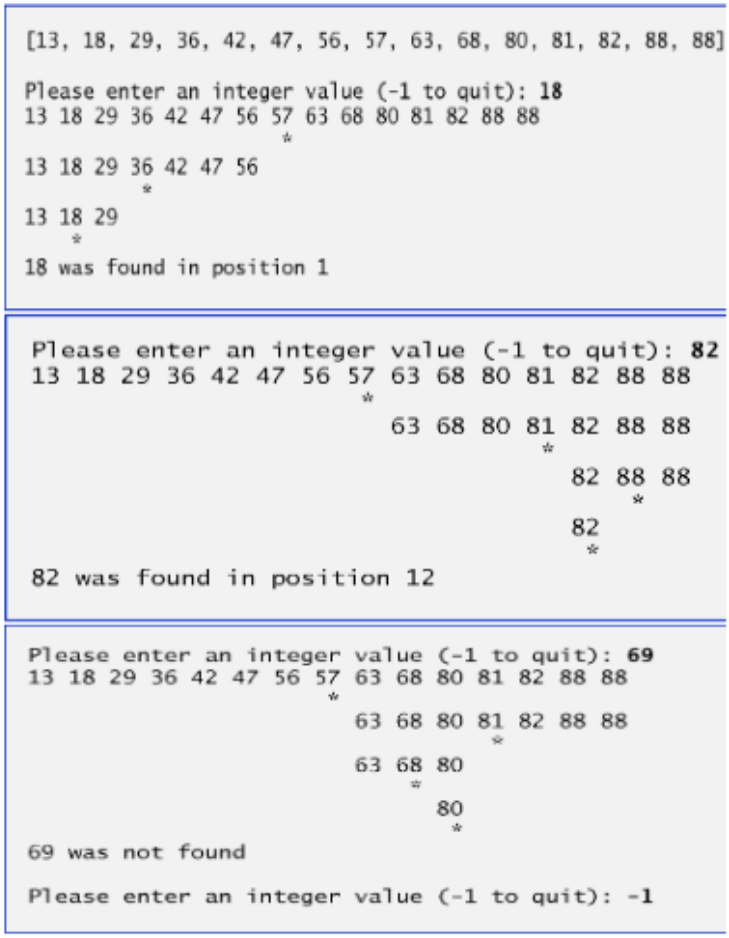
Assignment 4 – Search and Sort

Array Iterative Binary Search

Take a copy of the BinarySearchTest.java. Implement this class. Important: Only modify this .java file. Look for the comments: //to-complete. Make sure that this search algorithm is fully tested and running with this java file. No marks rewarded for non-iterative binary search algorithm Some of sample outputs of this algorithm is shown as below (The * in the output marks the middle element):



Selection Sort

Take a copy of the SelectionSortTest.java. Implement this class. Important: Only modify this .java file. Look for the comments: //to-complete. Make sure that this sorting algorithm is

fully tested and running with this java file. Some of sample outputs of this algorithm is shown as below (The * in the output marks the middle element):

```
Unsorted array: [40, 60, 59, 46, 98, 82, 23, 51, 31, 36]

after pass  1: 23  60  59  46  98  82  40* 51  31  36
               --
after pass  2: 23  31  59  46  98  82  40  51  60* 36
               --  --
after pass  3: 23  31  36  46  98  82  40  51  60  59*
               --  --  --
after pass  4: 23  31  36  40  98  82  46* 51  60  59
               --  --  --  --
after pass  5: 23  31  36  40  46  82  98* 51  60  59
               --  --  --  --  --
after pass  6: 23  31  36  40  46  51  98  82* 60  59
               --  --  --  --  --  --
after pass  7: 23  31  36  40  46  51  59  82  60  98*
               --  --  --  --  --  --  --
after pass  8: 23  31  36  40  46  51  59  60  82* 98
               --  --  --  --  --  --  --  --
after pass  9: 23  31  36  40  46  51  59  60  82* 98
               --  --  --  --  --  --  --  --  --

Sorted array: [23, 31, 36, 40, 46, 51, 59, 60, 82, 98]
```

Insertion Sort

Take a copy of the InsertionSortTest.java. Implement this class. Important: Only modify this .java file. Look for the comments: //to-complete. Make sure that this sorting algorithm is fully tested and running with this java file. Some of sample outputs of this algorithm is shown as below (The * in the output marks the middle element):

```
Unsorted array: [34, 96, 12, 87, 40, 80, 16, 50, 30, 45]

after pass  1: 34  96* 12  87  40  80  16  50  30  45
               --  --
after pass  2: 12* 34  96  87  40  80  16  50  30  45
               --  --  --
after pass  3: 12  34  87* 96  40  80  16  50  30  45
               --  --  --  --
after pass  4: 12  34  40* 87  96  80  16  50  30  45
               --  --  --  --  --
after pass  5: 12  34  40  80* 87  96  16  50  30  45
               --  --  --  --  --  --
after pass  6: 12  16* 34  40  80  87  96  50  30  45
               --  --  --  --  --  --  --
after pass  7: 12  16  34  40  50* 80  87  96  30  45
               --  --  --  --  --  --  --  --
after pass  8: 12  16  30* 34  40  50  80  87  96  45
               --  --  --  --  --  --  --  --  --
after pass  9: 12  16  30  34  40  45* 50  80  87  96
               --  --  --  --  --  --  --  --  --  --

Sorted array: [12, 16, 30, 34, 40, 45, 50, 80, 87, 96]
```

Bubble Sort

Take a copy of the BubbleSortTest.java. Implement this class. Important: Only modify this .java file. Look for the comments: //to-complete. Make sure that this sorting algorithm is fully tested and running with this java file.