

LAB 08

SUBMISSION INSTRUCTIONS

Type/write your answers on the document and submit it as a pdf file with the name **JaneDoe.pdf** (replace **JaneDoe** with your first and last name respectively).

QUESTIONS

1. What is the best and the 2 worst-case scenarios of using a linear search?

The best-case scenario for linear search is $O(1)$ when the item you're looking for is at index 0 of the array. The worst cases are $O(n)$, for when the item is at the end of the array and if the item is not in the array.

2. Using a tracing table, show how 6 would be obtained using a binary search.

2 4 5 6 8 11 15			
Low index	Mid index	High index	Element[mid]
0	3	6	6

We found 6 on our first iteration of binary search.

3. Using a tracing table, show how 2 would be obtained using a binary search.

2 4 5 6 8 11 15			
Low index	Mid index	High index	Element[mid]
0	3	6	6
0	1	2	4
0	0	0	2

We found 2 on our third iteration of binary search.

4. Using a tracing table, show how 15 would be obtained using a binary search.

2 4 5 6 8 11 15			
Low index	Mid index	High index	Element[mid]
0	3	6	6
4	5	6	11
6	6	6	15

We found 15 on our third iteration of binary search.

5. Sort the collection below in ascending order using the bubble sort.

2 9 5 4 8 1					
2	5	4	8	1	9
2	4	5	1	8	9
2	4	1	5	8	9
2	1	4	5	8	9
1	2	4	5	8	9

6. Sort the collection below in descending order using the bubble sort.

2 9 5 4 8 1					
9	5	4	8	2	1
9	5	8	4	2	1
9	8	5	4	2	1

9	8	5	4	2	1
9	8	5	4	2	1

7. Sort the collection below in ascending order using the selection sort.

2 9 5 4 8 1

2	9	5	4	8	1
1	9	5	4	8	2
1	2	5	4	8	9
1	2	4	5	8	9
1	2	4	5	8	9
1	2	4	5	8	9

8. Sort the collection below in descending order using the selection sort.

2 9 5 4 8 1

2	9	5	4	8	1
9	2	5	4	8	1
9	8	5	4	2	1
9	8	5	4	2	1
9	8	5	4	2	1
9	8	5	4	2	1
9	8	5	4	2	1

9. Sort the collection below in ascending order using the insertion sort.

2 9 5 4 8 1

2	9	5	4	8	1
2	9	5	4	8	1
2	5	9	4	8	1
2	4	5	9	8	1
2	4	5	8	9	1
1	2	4	5	8	9

10. Sort the collection below in descending order using the insertion sort.

2 9 5 4 8 1

2	9	5	4	8	1
2	9	5	4	8	1
9	5	2	4	8	1
9	5	4	2	8	1
9	8	5	4	2	1
9	8	5	4	2	1
9	8	5	4	2	1