

## LAB 08

### SUBMISSION INSTRUCTIONS

Type/write your answers on the document and submit it as a pdf file with the name **JaneDoe8.pdf** (replace **JaneDoe** with your first and last name respectively).

### QUESTIONS

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

The best case scenario would be if the target value is at the start of the array or list, while the worst case scenarios would be if the target was at the very end or not present at all.

2. Using a tracing table, show how 8 would be obtained using a binary search.

**2   4   5   6   8   11   15**

**Pass | Low | Med | High | Value**

**(1) – 0, 3, 6 – “6”**

**(2) – 4, 5, 6 – “11”**

**(3) – 4, 4, 5 – ‘8”**

**Element 8 at Index 4**

3. Using a tracing table, show how 20 would be obtained using a binary search.

**2   4   5   6   8   11   15**

**Pass | Low | Med | High | Value**

**(1) – 0, 3, 6 – “6”**

**(2) – 4, 5, 6 – “11”**

**(3) – 5, 5, 6 – “11”**

**(4) – 6, 6, 6 – “15”**

**Element Not Found**

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

**2   4   5   6   8   11   15**

**Pass | Low | Med | High | Value**

**(1) – 0, 3, 6 – “6”**

**(2) – 0,1,2 – “4”**

**(3) – 0,0,1 – “2”**

**Element 2 at Index 0**

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

8 1 3 2 9  
8 1 3 9 2  
8 1 9 3 2  
8 9 1 3 2  
9 8 1 3 2  
9 8 1 3 2  
9 8 3 1 2  
9 8 3 2 1

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

8 1 3 2 9 5  
8 1 3 2 5 9  
8 1 3 2 5 9  
8 1 2 3 5 9  
1 8 2 3 5 9  
1 2 8 3 5 9  
1 2 3 8 5 9  
1 2 3 5 8 9

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

8 1 3 2 9  
1 8 3 2 9  
1 2 3 8 9

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

8 1 3 2 9 5  
1 8 3 2 9 5  
1 2 3 8 9 5  
1 2 3 5 8 9

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

8 1 3 2 9

1  
1 2  
1 2 3  
1 2 3 8  
1 2 3 8 9

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

8 1 3 2 9 5

1  
1 2  
1 2 3  
1 2 3 5  
1 2 3 5 8  
1 2 3 5 8 9

11. Sort the collection below in ascending order using the merge sort.

8 1 3 2 9

8, 1 | 3, 2, 9  
8 | 1 | 3 | 2 | 9  
1, 8 | 2, 3 9 |  
1, 2, 3, 8, 9

12. Sort the collection below in descending order using the merge sort.

8 1 3 2 9 5

8, 1, 3 | 2, 9, 5  
8 | 1, 3 | 2 | 9, 5  
8 | 1 | 3 | 2 | 9 | 5  
8, 1 | 3, 2 | 9, 5  
8, 3, 2, 1 | 9, 5  
9, 8, 5, 3, 2, 1