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

Best Case - Required element is first element in the list, O(1) time complexity as it doesn't need to traverse the rest of the elements

Worst Case - Required element is last element in the list, O(n) time complexity as it must traverse each element of an n sized list

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

2 4 5 6 8 11 15

key = 6

low	mid = (low + high) /2	high	element[mid]
0	3	6	6 (found)

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

2 4 5 6 8 11 15

key = 2

low	mid = (low + high)/2	high	element[mid]
0	3	6	6 (high)
0	1	2	4 (high)
0	0	0	2 (found)

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

2 4 5 6 8 11 15

key = 15

low	mid = (low + high) / 2	high	element[mid]
0	3	6	6 (low)
4	5	6	11 (low)
6	6	6	15 (found)

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

2 9 5 4 8 1

Iteration 1:	Iteration 2:	Iteration 3:	Iteration 4:	Iteration 5:
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

Iteration 1:	Iteration 2:	Iteration 3:	Iteration 4:	Iteration 5:
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

Iteration 1:	Iteration 2:	Iteration 3:	Iteration 4:	Iteration 5:
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

Iteration 1:	Iteration 2:	Iteration 3:	Iteration 4:	Iteration 5:
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. Sort the collection below in ascending order using the insertion sort.

2 9 5 4 8 1

Iteration 1:	Iteration 2:	Iteration 3:	Iteration 4:	Iteration 5:
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

Iteration 1:	Iteration 2:	Iteration 3:	Iteration 4:	Iteration 5:
9 2 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