Assignment 10 - Searching, sorting and performance

Graded

Student

AKSHAJ KAMMARI

Total Points

65 / 65 pts

Question 1

Sequential Search — **11** / 11 pts

1.1 (no title) — **4** / 4 pts

✔ **+ 4 pts** Correct

+ 0 pts Incorrect

1.2 (no title) — **2** / 2 pts

✔ **+ 2 pts** Correct

+ 0 pts Incorrect

1.3 (no title) — **5** / 5 pts

✔ **+ 5 pts** Correct

+ 0 pts Incorrect

Question 2

Binary Search — **9** / 9 pts

2.1 (no title) — **3** / 3 pts

✔ **+ 3 pts** Correct

+ 0 pts Incorrect

2.2 (no title) — **2** / 2 pts

✔ **+ 2 pts** Correct

+ 0 pts Incorrect

2.3 (no title) — **4** / 4 pts

✔ **+ 4 pts** Correct

+ 0 pts Incorrect

Question 3

Selection Sort **5** / 5 pts

3.1 **(no title)** **2** / 2 pts

✔ **+ 2 pts** Correct

+ 0 pts Incorrect

3.2 **(no title)** **3** / 3 pts

✔ **+ 3 pts** Correct

+ 0 pts Incorrect

Question 4

Insertion Sort **5** / 5 pts

4.1 **(no title)** **2** / 2 pts

✔ **+ 2 pts** Correct

+ 0 pts Incorrect

4.2 **(no title)** **3** / 3 pts

✔ **+ 3 pts** Correct

+ 0 pts Incorrect

Question 5

Mergesort **5** / 5 pts

5.1 **(no title)** **2** / 2 pts

✔ **+ 2 pts** Correct

+ 0 pts Incorrect

5.2 **(no title)** **3** / 3 pts

✔ **+ 3 pts** Correct

+ 0 pts Incorrect

Question 6

Sort Detective **30** / 30 pts

6.1 **(no title)** **10** / 10 pts

✔ **+ 10 pts** Correct

+ 0 pts Incorrect

6.2 **(no title)** **10** / 10 pts

✔ **+ 10 pts** Correct

+ 0 pts Incorrect

6.3 **(no title)** **10** / 10 pts

✔ **+ 10 pts** Correct

+ 0 pts Incorrect

Q1 Sequential Search
11 Points

Q1.1
4 Points

In what situation we CAN use sequential search? (chose all that apply)

- [x] when the array is sorted and the target is in the array.
- [x] when the array is sorted and the target is not in the array.
- [x] when the array is not sorted and the target is in the array.
- [x] when the array is not sorted and the target is not in the array

Q1.2
2 Points

What is the big O of sequential search? (n is the length of the array)

- [ ] O(1)
- [ ] O(log n)
- [x] O(n)
- [ ] O(n log n)
- [ ] O(n2)
- [ ] O(!n)

Q1.3
5 Points

Using the array `11, 30, 34, 90, 99` as the input for sequential search, how many array elements are accessed in order to find the target element 34?

- [ ] 1 element
- [ ] 2 elements
- [x] 3 elements
- [ ] 4 elements
- [ ] 5 elements
- [ ] sequential search does not work here

Q2 Binary Search
9 Points

Q2.1
3 Points

In what situation we CAN use binary search? (chose all that apply)

- [x] when the array is sorted and the target is in the array
- [x] when the array is sorted and the target is not in the array
- [ ] when the array is not sorted and the target is in the array
- [ ] when the array is not sorted and the target is not in the array

Q2.2
2 Points

What is the big O of binary search? (n is the length of the array)

- ( ) O(1)
- (•) O(log n)
- ( ) O(n)
- ( ) O(nlog n)
- ( ) O(n2)
- ( ) O(!n)

Q2.3
4 Points

Which of the following statements about binary search is NOT true?

- ○ it is the fastest searching algorithm we have learned in CS111
- ○ it does not work if the target is not in the array
- ◉ it does need extra array space for it to run
- ○ the best case scenario is when the target is in the middle of the array

Q3 Selection Sort

5 Points

Q3.1

2 Points

What is the big O of selection sort? (n is the length of the array)

- ○ O(log n)
- ○ O(n log n)
- ○ O(n)
- ◉ O(n^2)
- ○ O(n^3)
- ○ O(!n)

Q3.2

3 Points

What is the best case for selection sort?

- ○ when the array is already sorted
- ○ when the array is already sorted backward
- ○ when the array is sorted by pairs
- ◉ there are no best case for selection sort

Q4 Insertion Sort
5 Points

Q4.1
2 Points

4.1 (points) What is the big O of insertion sort? (n is the length of the array)

- ○ O(n log n)
- ○ O(n)
- ◉ O(n^2)
- ○ O(n^3)
- ○ O(!n)

Q4.2
3 Points

What is the best case for insertion sort?

- ◉ when the array is already sorted
- ○ when the array is already sorted backward
- ○ when the array is sorted by pairs
- ○ there are no best case for insertion sort

Q5 Mergesort
5 Points

Q5.1
2 Points

What is the big O of mergesort? (n is the length of the array)

- ○ O(log n)
- ◉ O(n log n)
- ○ O(n)
- ○ O(n^2)
- ○ O(n^3)
- ○ O(!n)

Q5.2
3 Points

What is the best case for merge sort?

- ○ when the array is already sorted
- ○ when the array is already sorted backward
- ○ when the array is sorted by pairs
- ◉ there are no best case for merge sort

Q6 Sort Detective

30 Points

Identify Algorithms given to you in the *SortDetective* program.

Q6.1

10 Points

Which sorting algorithm is Algorithm 1?

- ○ Insertion sort
- ○ Selection sort
- ◉ Merge sort

Q6.2

10 Points

Which sorting algorithm is Algorithm 2?

- ◉ Insertion sort
- ○ Selection sort
- ○ Merge sort

Q6.3

10 Points

Which sorting algorithm is Algorithm 3?

- ○ Insertion sort
- ◉ Selection sort
- ○ Merge sort