IT2001-Quiz2-Nov2022

Due 11 Nov at 0:20   **Points** 20   **Questions** 20
Available 10 Nov at 23:00 - 11 Nov at 0:20 1 hour and 20 minutes
Time limit 20 Minutes

Instructions

Attempt all the questions. You can see only one question at a time and the question will be locked after answering which you can not modify later.

This quiz was locked 11 Nov at 0:20.

Attempt history

	Attempt	**Time**	**Score**
LATEST	[Attempt 1](#)	20 minutes	2.17 out of 20

Score for this quiz: **2.17** out of 20
Submitted 10 Nov at 23:20
This attempt took 20 minutes.

Question 1	**0 / 1 pts**

Assume the given input list: 1430, 3292, 7684, 1338, 193, 595, 4243, 9002, 4393, 130, 1001 Intermediate steps in performing one sorting algorithm on the input list are given below. The steps do not necessarily represent consecutive steps in the algorithm but they are in the correct sequence. :

Intermediate steps:

1430, 3292, 7684, 193, 1338, 595, 4243, 9002, 4393, 130, 1001
1430, 3292, 193, 1338, 7684, 595, 4243, 9002, 130, 1001, 4393
193, 1338, 1430, 3292, 7684, 130, 595, 1001, 4243, 4393, 9002

Select the algorithm it illustrates from among the following choices:
Insertion sort, Selection sort, Mergesort, Quicksort (first element of the
sequence as the pivot), and Heapsort Heapsort .

Answer 1:

Heapsort

Mergesort

Question 2

1 / 1 pts

Assume that intermediate steps in performing various sorting algorithms
on the input list are given below. The steps do not necessarily represent
consecutive steps in the algorithm but they are in the correct sequence.
Input list:1430, 3292, 7684, 1338, 193, 595, 4243, 9002, 4393, 130, 1001

Intermediate steps:

1338, 193, 595, 130, 1001, 1430, 3292, 7684, 4243, 9002, 4393
193, 595, 130, 1001, 1338, 1430, 3292, 7684, 4243, 9002, 4393
130, 193, 595, 1001, 1338, 1430, 3292, 4243, 9002, 4393, 7684

Select the algorithm it illustrates from among the following choices:
Insertion sort, Selection sort, Mergesort, Quicksort (first element of the
sequence as the pivot), and Heapsort Quicksort .

Answer 1:

Quicksort

Question 3

0 / 1 pts

Assume that intermediate steps in performing various sorting algorithms on the input list are given below. The steps do not necessarily represent consecutive steps in the algorithm but they are in the correct sequence. Input list:1430, 3292, 7684, 1338, 193, 595, 4243, 9002, 4393, 130, 1001

Intermediate steps:

1338, 1430, 3292, 7684, 193, 595, 4243, 9002, 4393, 130, 1001
193, 1338, 1430, 3292, 7684, 595, 4243, 9002, 4393, 130, 1001
193, 595, 1338, 1430, 3292, 7684, 4243, 9002, 4393, 130, 1001

Select the algorithm it illustrates from among the following choices: insertion sort, selection sort, mergesort, quicksort (first element of the sequence as the pivot), and heapsort Heapsort .

Answer 1:

> Heapsort

Insertion sort

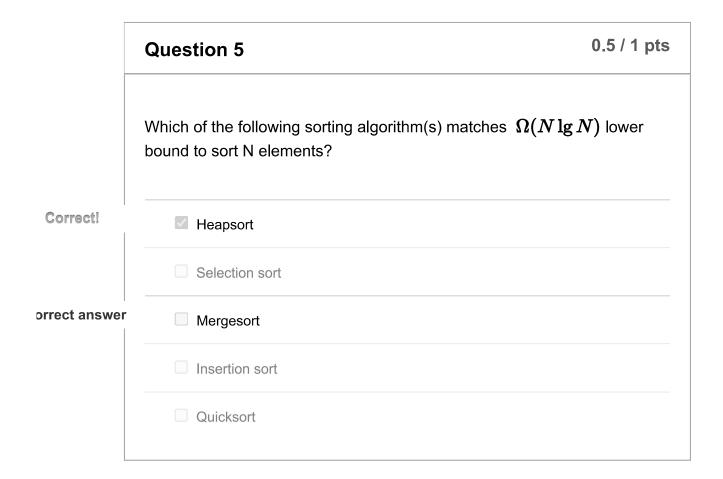## Question 4   0 / 1 pts

Assume that intermediate steps in performing various sorting algorithms on the input list are given below. The steps do not necessarily represent consecutive steps in the algorithm but they are in the correct sequence. Input list:1430, 3292, 7684, 1338, 193, 595, 4243, 9002, 4393, 130, 1001

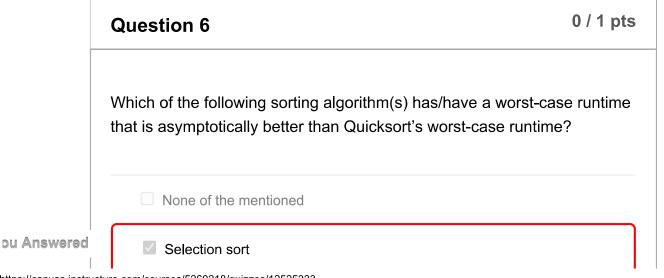Intermediate steps:

1430, 3292, 7684, 9002, 1001, 595, 4243, 1338, 4393, 130, 193
7684, 4393, 4243, 3292, 1001, 595, 193, 1338, 1430, 130, 9002
130, 4393, 4243, 3292, 1001, 595, 193, 1338, 1430, 7684, 9002

Select the algorithm it illustrates from among the following choices: insertion sort, selection sort, mergesort, quicksort (first element of the sequence as the pivot), and heapsort Selection sort .

Answer 1:

ou Answered

Selection sort

orrect answer

Heapsort

Question 5   0.5 / 1 pts

Which of the following sorting algorithm(s) matches $\Omega(N \lg N)$ lower bound to sort N elements?

Correct!

☑ Heapsort

☐ Selection sort

orrect answer

☐ Mergesort

☐ Insertion sort

☐ Quicksort

Question 6   0 / 1 pts

Which of the following sorting algorithm(s) has/have a worst-case runtime that is asymptotically better than Quicksort's worst-case runtime?

☐ None of the mentioned

ou Answered

☑ Selection sort

Correct!

☑ Mergesort

rrect answer

☐ Heapsort

ou Answered

☑ Insertion sort

Question 7   0 / 1 pts

Consider the following sorting algorithm to sort (in an ascending order) an array A of n distinct integers. In the first step, the algorithm finds out the maximum among all elements of A and swaps it with the last element of A. In the second step, the algorithm finds out the maximum among all elements of A except the last one and swaps it with the last-but-one element of A. The algorithm continues in this manner till all the elements are sorted.

Identify the asymptotically best-case (assume a uniformly-random ordering of the elements of A) running time of this algorithm.

ou Answered

☑ O(n)

rrect answer

☐ $\Theta(n^2)$

rrect answer

☐ $O(n^3)$

rrect answer

☐ $O(n^2)$

Question 8   0.33 / 1 pts

A sorting algorithm is called stable if it maintains the relative positions of two records with equal keys. For example, if a record X appears before a record Y (with equal keys), a sorting algorithm is stable if X remains before Y after sorting.

Which of the following sorting algorithm(s) is/are unstable?

☐ Insertion sort

orrect answer   ☐ Selection Sort

orrect answer   ☐ Quicksort

☐ Mergesort

Correct!   ☑ Heapsort

Question 9   0 / 1 pts

Which of the following sorting algorithm(s) perform(s) $\Theta(N)$ pairwise swaps of elements to sort N elements?

ou Answered   ☑ Mergesort

orrect answer   ☐ Selection sort

ou Answered   ☑ Insertion sort

☐ Quicksort

☐ Heapsort

Question 10   0.33 / 1 pts

Which of the following sorting algorithm(s) never compare(s) the same
two elements twice to sort N elements?

orrect answer   ☐ Quicksort

                       ☐ Mergesort

                       ☐ Insertion sort

orrect answer   ☐ Selection sort

Correct!   ☑ Heapsort

Question 11   0 / 1 pts

Which of the following sorting algorithm(s) has/have $\Theta(\lg N)$ best-case
time complexity to sort N elements?

ou Answered   ☑ Insertion sort

                       ☐ Heapsort

ou Answered   ☑ Mergesort

ou Answered   ☑ Selection sort

                       ☐ Quicksort

orrect answer   ☐ None of the mentioned

Question 12   0 / 1 pts

Which of the following sorting techniques is/are based on the Divide-and-Conquer strategy?

☐ Insertion sort

ou Answered   ☑ Heapsort

orrect answer   ☐ Quicksort

orrect answer   ☐ Mergesort

Question 13   0 / 1 pts

Which of the following sorting techniques take(s) O(n) time in the best case?

orrect answer   ☐ Insertion sort

ou Answered   ☑ Selection sort

ou Answered   ☑ Merge sort

☐ Heapsort

☑ Quicksort

Question 14   0 / 1 pts

How many calls of mergesort are performed when sorting an array of size 64?

(Fill in the blank with ONLY integer, must not use any variable)

ou Answered

6

orrect Answers   127

Question 15   0 / 1 pts

How many calls of mergesort are performed when sorting an array of size 128?

(Fill in the blank with ONLY integer, must not use any variable)

ou Answered

7

orrect Answers   255

Jnanswered **Question 16**   0 / 1 pts

What will be the worst case asymptotic upper bound on the running time of Insertion sort if the input is reversely sorted?

☐ O(n)

orrect answer

☐ $O(n^2)$

☐ None of the mentioned

☐ $O(n \lg n)$

Jnanswered

Question 17   0 / 1 pts

What will be the worst case asymptotic upper bound on the running time of Insertion sort if the input is a list containing n copies of the same number?

☐ $O(n^2)$

☐ $O(n \lg n)$

☐ None of the mentioned

orrect answer

☐ O(n)

Jnanswered

Question 18   0 / 1 pts

What will be the worst-case asymptotic upper bound on the running time of Quicksort if the input is reversely sorted?

⬜ None of the mentioned

⬜ $O(n^2)$

⬜ $O(n \lg n)$

⬜ O(n)

Unanswered

Question 19

0 / 1 pts

What will be the worst-case asymptotic upper bound on the running time of Quicksort if the input is a list containing n copies of the same number?

orrect answer

⬜ $O(n^2)$

⬜ $O(n \lg n)$

⬜ None of the mentioned

⬜ O(n)

Unanswered

Question 20

0 / 1 pts

What will be the worst-case asymptotic upper bound on the running time of the Selection sort the input is a list containing n copies of the same number?

orrect answer

☐ $O(n^2)$

☐ O(n)

☐ $O(n \lg n)$

☐ None of the mentioned

Quiz score: **2.17** out of 20