

Unit 5 - Week 3

Course outline

How does an NPTEL online course work?

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Week 3

● Lecture 11: Analysis of Quicksort.

● Lecture 12: Randomized Quicksort

○ Lecture 13: Heap

○ Lecture 14: Heap Sort

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Assignment 3

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-02-19, 23:59 IST.

1) The best case behaviour occurs for quick sort is, if partition splits the array of size n into

- (a) $n/2 : (n/2) - 1$
 (b) $n/2 : n/3$
 (c) $n/4 : 3n/2$
 (d) $n/4 : 3n/4$

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:

a.

1 point

2) Consider the Quick sort algorithm which sorts elements in ascending order using the first element as pivot. Then which of the following input sequence will require a maximum number of comparisons when this algorithm is applied on it?

- (a) 22 25 56 67 89
 (b) 52 25 76 67 89
 (c) 22 25 76 67 50
 (d) 52 25 89 67 76

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:

a.

1 point

3) Which of the following represents the max heap property?

- (a) Value of left child > Value of right child
 (b) Value of children > Value of parents
 (c) Value of parent > Value of children
 (d) Value of right child > Value of left child

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:

c.

1 point

4) While sorting the numbers (70, 48, 76, 58, 43, 47, 78, 53) using quicksort, the last number is chosen as pivot, what will be the permutation of the numbers after partition function has been applied?

- (a) 48 43 47 53 70 76 78 58
 (b) 43 47 48 53 58 70 76 78
 (c) 48 47 43 53 70 78 76 58
 (d) 47 48 43 53 78 76 70 58

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:

a.

1 point

5) What is the best case time complexity of quicksort?

- (a) $\theta(n \cdot \log n)$
 (b) $\theta(n^2)$
 (c) $\theta(n)$
 (d) $\theta(1)$

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:

a.

1 point

6) What is the height of a binary heap?

- (a) $\mathcal{O}(n)$
 (b) $\mathcal{O}(n \log n)$
 (c) $\mathcal{O}(\log n)$
 (d) $\mathcal{O}(n^2)$

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:

c.

1 point

7) What is the recurrence relation of the best case in quicksort?

- (a) $T(n) = T(n-1) + \theta(n)$
 (b) $T(n) = 2T(n/2) + \theta(n)$
 (c) $T(n) = T(n/2) + \theta(n^2)$
 (d) $T(n) = 2T(n/2) + \theta(n^2)$

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

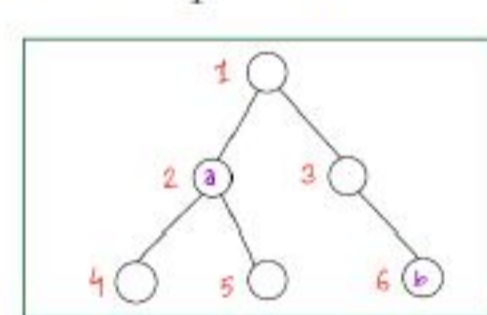
Accepted Answers:

b.

1 point

8) Max heap is built using the numbers (12, 1, 4, 8, 6, 13, 9, 3). Assuming the first position number to be 1, what will be the new position numbers of 12 and 6 respectively, after the max heap is built?

- (a) 3, 5
 (b) 3, 4
 (c) 3, 6
 (d) 2, 6



Here the position numbers of a and b are 2 and 6 respectively.

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:

a.

1 point

9) Which of the following algorithms is better when dealing with reverse sorted numbers?

- (a) Quicksort
 (b) Heap sort
 (c) Insertion sort
 (d) all are equally good

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:

b.

1 point

10) element of an input array is chosen as pivot in Randomized Quicksort

- (a) The first number in array
 (b) The last number in the array
 (c) The median of the numbers
 (d) A randomly selected number from the array

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:

d.

1 point