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AICTE (<https://swayam-uat-central.appspot.com/explorer?ncCode=AICTE>) » **Programming and Data Structures with Python (course)**



Course
outline

Practice
Assignments

Practice Quiz 1

Quiz 1, Mon 25
Oct 2021

PDSP
Assignment 1,
due Tue 2 Nov
2021

PDSP
Assignment 2,
due Fri 12 Nov
2021

Quiz 2, Mon 8
Nov 2021

PDSP
Assignment 3,
due Wed 24 Nov
2021

PDSP
Assignment 4,

PDSP Quiz 4

The due date for submitting this assignment has passed.

Due on 2021-12-23, 15:30 IST.

Score: 10/10=100%

Assignment submitted on 2021-12-23, 15:21 IST

All questions carry equal weightage. All Python code is assumed to be executed using Python3. You may submit as many times as you like within the deadline. Your final submission will be graded.

1) Consider the min-heap [17, 21, 38, 39, 76, 89, 54, 43, 42], built by repeatedly inserting values into an empty heap. Which of the following *could not* have been the last element inserted into this heap? **2 points**

- ☐ 17
☐ 21
☐ 42
☒ 43

Yes, the answer is correct.

Score: 2

Feedback:

The last position added was the one containing 42. The last element added must lie on the path from 42 to the root: {17,21,38,42}

Accepted Answers:

43

due Fri 17 Dec 2021

Quiz 3, Thu 16 Dec 2021

PDSP Quiz 4,
Thu 23 Dec 2021

● Quiz: PDSP
Quiz 4
(assessment?
name=27)

PDSP
Assignment 5,
due Fri 31 Dec 2021

2) Consider the min-heap [17, 38, 21, 39, 76, 53, 88, 97, 82] built by repeatedly inserting values into an empty heap. Suppose the last value inserted was 38. What was the heap structure before this value was inserted? **2 points**

- ☐ [17, 21, 39, 82, 76, 53, 88, 97]
- ☒ [17, 39, 21, 82, 76, 53, 88, 97]
- ☐ [17, 39, 21, 82, 76, 53, 97, 88]
- ☐ [17, 39, 21, 82, 76, 88, 53, 97]

Yes, the answer is correct.

Score: 2

Feedback:

Push 38 down the path towards the last leaf 82. Swap 38 with 39 and then with 82.

Accepted Answers:

[17, 39, 21, 82, 76, 53, 88, 97]

3) Suppose we apply the delete-min() operation to the heap [17, 21, 38, 39, 76, 89, 54, 43, 42]. The resulting heap would be: **2 points**

- ☒ [21, 39, 38, 42, 76, 89, 54, 43]
- ☐ [21, 38, 39, 42, 76, 89, 54, 43]
- ☐ [21, 39, 38, 76, 42, 89, 54, 43]
- ☐ [21, 39, 38, 42, 76, 54, 89, 43]

Yes, the answer is correct.

Score: 2

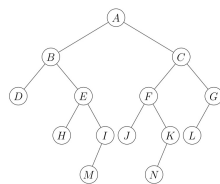
Feedback:

The usual delete-min() operation.

Accepted Answers:

[21, 39, 38, 42, 76, 89, 54, 43]

4) Suppose that the following is a binary search tree. The letters indicate the names of the nodes, not the values that are stored. **2 points**



What is the predecessor node, in terms of value, of the root node A?

- ☐ D
- ☐ H
- ☒ I
- ☐ M

Yes, the answer is correct.

Score: 2

Feedback:

The rightmost node in the left subtree.

Accepted Answers:

I

5) We have n distinct values stored in a binary search tree. Define the height of a tree **2 points** to be the number of nodes in the longest path from root to leaf. Which of the following statements is *not* true?

- ☐ If the root is the median value, the height of the tree is at most $n/2$.
- ☒ If the root is the median value, the height of the tree is at most $\log n$.
- ☐ The height of the tree is at least $\log n$.
- ☐ The height of the tree is at most n .

Yes, the answer is correct.

Score: 2

Feedback:

An upper bound of $\log n$ on the height requires the tree to be balanced.

Accepted Answers:

If the root is the median value, the height of the tree is at most $\log n$.