Unit 9 - Week 7

Course outline

How does an NPTEL online course work?

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Week 7

- Lecture 31 : Fixed universe successor
- Lecture 32 : Van Emde Boas data structure
- Lecture 33: Amortized analysis
- Lecture 34: Computational Geometry
- Lecture 35: Computational Geometry (cont...)
- Week 7: Lecture Notes
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- Week 7 Feedback Form

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Assignment 7

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

Due on 2020-03-18, 23:59 IST.

1) "In an amortized analysis, the time required to perform a sequence of data-structure operations is summed over all the operations performed". This statement is *1 point*

(a) True
(b) False

a.
b.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

2) If red black tree is used to store the dynamic set S in sweep-line algorithm, then the total running time of the algorithm is *1 point*

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

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

3) Suppose we perform a sequence of n operations on a data structure in which the i^{th} operation costs i if i is an exact power of 2, and 1 otherwise. Using aggregate analysis the amortized cost per operation is *1 point*

(a) $\mathcal{O}(n)$
(b) $\mathcal{O}(n \log n)$
(c) $\mathcal{O}(1)$
(d) $\mathcal{O}(\log n)$

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

4) The space complexity of a $2-D$ range tree is *1 point*

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

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

5) $\mathcal{O}(\log \log u)$ is the worst case time complexity of *1 point*

(a) Finding Successor in Van Emde Boas Data Structure
(b) Finding Predecessor in Van Emde Boas Data Structure
(c) Inserting into Van Emde Boas Data Structure
(d) All of the above

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

6) In Van Emde Boas Data Structure ,if size of the universe is 16 ,how many widgets (blocks) will the universe be split into ? *1 point*

(a) 3
(b) 4
(c) 5
(d) 2

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

7) Given the dynamic set $S = \{1, 7, 11, 13\}$ and the size of the universe is 16, What will the call Predecessor(9) return? *1 point*

(a) 7
(b) 1
(c) 11
(d) 0

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

8) A sequence of n insertions into a dynamic table will have a worst case runtime of *1 point*

(a) $\theta(n \log n)$
(b) $\theta(n)$
(c) $\theta(1)$
(d) None of these

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

9) In amortized analysis, what will be the cost of insertion of the $6^{th}, 5^{th}, 12^{th}, 17^{th}$, and 9^{th} insertion, respectively? *1 point*

(a) $1, 5, 1, 17, 1$
(b) $6, 1, 12, 1, 9$
(c) $1, 5, 1, 17, 9$
(d) $1, 5, 12, 17, 9$

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

10) In Table Doubling, to store 56 elements, how many tables will need to be dynamically allocated? *1 point*

(a) 7
(b) 8
(c) 4
(d) 9

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.