문제 1

0 / 6점

1. Given the conditions below, check all corre

$\Theta(g$

$f($

a. $f(n) = \Theta(2^n)$
b. $f(n) \in O(e^n)$
c. $g(n) \in O(f(n))$
d. $\Theta(g(n)) \subset o(f(n))$
e. $O(f(n)) \subset O(n!)$
f. $\Omega(f(n)) = \Omega(n^2)$

- [ ] a
- [x] b
- [ ] c
- [ ] d
- [x] e
- [ ] f

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문제 2

0 / 5점

2. Given the conditions below, check all corre

$f($
$f($

a. $f(n) = \Omega(n \lg n)$
b. $f(n) = \Theta(n \lg n)$
c. $f(n) = \Theta(n \ln n)$
d. $o(\lg(n^n)) \subset O(f(n))$
e. $\Omega(\ln n) \subset \Omega(f(n))$

- [ ] a
- [x] b
- [x] c
- [ ] d
- [ ] e

문제 3

평가 안 됨 / 4점

3. Find a good asymptotic tight bound on the following recurrence

$$T(n) = 3T\left(\frac{n}{3}\right) + \frac{n}{\log_3 n}$$

where $T(n)$ is constant for sufficiently small n and a is a constant gre

(Hint: Draw a recursion tree and you might need to use $1 + \frac{1}{2} + \cdots +$

Use the following expressions for the terms if necessary.

- Θ: \Theta
- $\log_3 n$: log_3(n)

----- < 학생이 제출한 답안 > -----

T(n) = Theta(n * logn)

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문제 4

0 / 2점

4. Check all correct statements.
Suppose that all dimensions are the same for all matrices A_i for $i = 1,2,$ $p_{i-1}p_i$ and $p_{i-1} = p_i$ for all $i = 1,2, \dots, n$.
   a. There are at least 2^n alternative parenthesizations for the all ma
   b. The number of scalar multiplications to compute the product A_1

- [ ] a
- [x] b

문제 5

평가 안 됨 / 2점

5. Let $X = (B, D, C, B, A), Y = (C, B, C, B, D, A)$, and $Z = (z_1, z_2, \dots, z_k)$. If what is z_k?

----- < 학생이 제출한 답안 > -----

zk = A

문제 6

평가 안 됨 / 2점

6. Is it possible to apply greedy algorithm right away for solving the activity the provided table below (9 activities and their start and finish times)? If otherwise, answer the reason.

i	1	2	3	4	5	6	7
s_i	9	1	7	6	7	1	4
f_i	10	4	10	8	8	7	6

----- < 학생이 제출한 답안 > -----

"NO". because it is not sorted. to solve activity- ... problem, the table must be sorted by finish time. c[i,j] = max{c[i,k] + c[k,j] +1 to use this, the sorted table is needed for optimal schedule.

문제 7

평가 안 됨 / 2점

7. (continued from the previous problem) Find one largest mutual
(Ex: {a_100, a_101, a_102})

----- < 학생이 제출한 답안 > -----

{a_1, a_4, a_7, a_8}

문제 8

평가 안 됨 / 2점

8. Suppose that we have n activities and use the insertion sort to sort the
time complexity of the activity-selection problem with greedy algorithr
represent the complexity. (Ex: O(n^3))

----- < 학생이 제출한 답안 > -----

O(n^2)

문제 9

평가 안 됨 / 4점

9. What is an optimal Huffman code for the following set of frequencies?

Character	a	b	c	d	e	f
Frequency	1	1	2	3	5	8

(Ex: a: 010, b: 1010001, c:1111)

----- < 학생이 제출한 답안 > -----

a:1111100

b:1111101

c:111111

d:11110

e:1110

f:110

g:10

h:0

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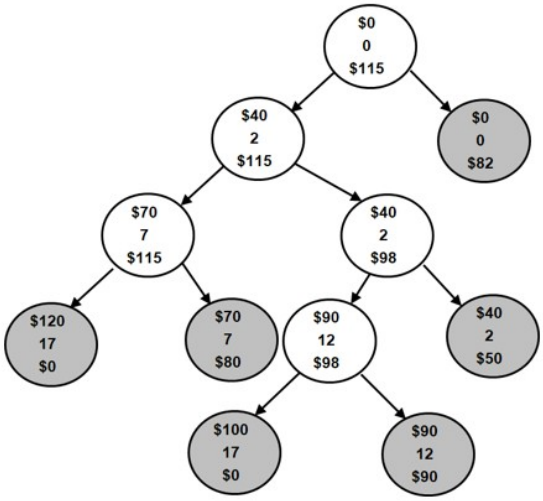
문제 10

0 / 2점

10. Given a tree obtained by branch and bound - best first search to solv with 4 items and $W = 16$, what is the max benefit?

i	b_i	w_i	b_i/w_i
1	$40	2	$20
2	$30	5	$6
3	$50	10	$5
4	$10	5	$2



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문제 11

평가 안 됨 / 2점

11. (continued from the previous problem) Explain why $\mathrm{Vertex}(1,2)$ (with bound 82) became a non-promising node?

----- < 학생이 제출한 답안 > -----

When extending from vertex (1, 2), that is, when calculating the remaining object, use the greedy algorithm to obtain the maximum expected benefit that fits into the backpack(that is bound) with fraction item. At this time, if this value is greater than the previously calculated max benefit(bound), it can be expanded(branch), but if not, it becomes non-promoting because there is no reason to expand

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문제 12

0 / 2점

12. (continued from the previous problem) Assume that item 3 and item 4 is the max benefit?

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문제 13

0 / 3점

13. Check all correct statements.
    a. In the case of the fractional knapsack problem, the greedy algo delivers optimal results.
    b. In the case of the 0-1 knapsack problem, the branch and bound better than other algorithms such as dynamic programming.
    c. We can apply dynamic programming to solve the 0-1 knapsack identify the problem.

- [x] a
- [ ] b
- [x] c