Reading Quiz #7

ⓘ This is a preview of the published version of the quiz

Started: Mar 18 at 11:18am

Quiz Instructions

To prepare for this quiz, please read sections 6.3 and 6.4 in the textbook

Note that you only have ***3 attempts*** possible.

Best of luck! :-)

Question 1 **1 pts**

The dynamic programming algorithm itself for segmented least squares (i.e., not the computation of the least-squares errors) runs in $O(n^2)$ time. Which of these best describes the reason why?

- ○ There are a linear number of subproblems to solve, each of which takes linear time to solve.
- ○ There are a quadratic number of subproblems to solve, each of which takes constant time to solve.
- ○ There are a constant number of subproblems to solve, each of which takes quadratic time to solve.
- ○ There are a linear number of subproblems, each of which takes constant time to solve, and each of which is resolved a linear number of times.

Question 2 **1 pts**

Consider the definition of the function OPT in page 269 of the textbook (section 6.4). With the following assumptions, which of these inequalities are always true?

- $3 \leq i \leq n-1$

- $1 \leq j \leq n$, which means w_j is one of the n items
- $w > w_j$, $w > a > 0$

- [ ] $\text{OPT}(i, w) \geq \text{OPT}(i - 3, w)$
- [ ] $\text{OPT}(i, w) \geq \text{OPT}(i + 1, w - w_j)$
- [ ] $\text{OPT}(i, w) \geq \text{OPT}(i, w - a)$
- [ ] $\text{OPT}(i, w) \geq \text{OPT}(i - 1, w - w_i)$

Question 3

1 pts

You are given a completed version of the two-dimensional table of OPT values for the problem of Subset-Sums below (just like the Figure 6.11 in the textbook), but you don't actually know the weights w_i of the items.

For this example you **can** guess the weights (using only the table). What is the sum of these weights?

(Just so we're on the same page, you can see from the table that $n = 3$ and $W = 9$, so there are actually three weights $w_1, w_2,$ and w_3, and you should calculate $w_1 + w_2 + w_3$)

i=3	0	0	2	3	3	5	5	7	8	8
i=2	0	0	2	2	2	5	5	7	7	7
i=1	0	0	0	0	0	5	5	5	5	5
i=0	0	0	0	0	0	0	0	0	0	0
	w=0	***w=1***	***w=2***	***w=3***	***w=4***	***w=5***	***w=6***	***w=7***	***w=8***	***w=9***

Not saved

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