Quiz 4 - Dynamic Programming and Backtracking

Due Feb 1 at 11:59pm **Points** 10 **Questions** 6
Available until Feb 2 at 11:59pm **Time Limit** None **Allowed Attempts** 2

Instructions

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This quiz will test your understanding of the material covered so far this week (MLOs).

This is an online quiz. There will be no time limit to the quiz. You can attempt the quiz twice and the best of the scores will be retained. This is open notes and open internet quiz but refrain from discussing with anybody during the exam.

Note that this test cannot be taken past the due date for any credit.

This quiz is worth 10 points.

You can view the correct answers here after the due date.

Take the Quiz Again

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	4 minutes	10 out of 10

Answers will be shown after your last attempt

Score for this attempt: **10** out of 10
Submitted Feb 1 at 3:44pm
This attempt took 4 minutes.

Question 1 1 / 1 pts

Given two integer arrays to represent weights and profits of 'N' items, find a subset of these items that will give us maximum profit such that their cumulative weight is not more than a given number 'C'. Best technique to solve this problem is?

- (●) Dynamic Programming
- ( ) Divide and Conquer
- ( ) Brute Force
- ( ) Backtracking

Question 2

2 / 2 pts

To find the optimal solution for 0-1 knapsack, what would be dimensions of the extra array that we would need? The knapsack has a capacity of W, and there are total of n items. Assume we are using the approach that was discussed in the exploration.

- ( ) Array[n+1]
- ( ) Array[W]
- ( ) Array[W][n]
- (●) Array[W+1][n+1]

Question 3

1 / 1 pts

We are given an array of numbers and we are asked to find an optimal solution to maximize the sum of numbers (i.e continuous subsequence that has maximum sum). if the order of the input numbers were altered or if we use a different algorithm, we will always end up with the same combination of numbers as answer.

- ○ True
- ◉ False

Question 4

2 / 2 pts

Backtracking is used to solve which of the problems:

- ○ Any numerical problems
- ○ Optimal solution problems
- ◉ To find all possible solutions
- ○ Problems that have sub-problems similar to divide and conquer

Question 5

2 / 2 pts

What is the correct recurrence formula for the unbound knapsack problem that was discussed in the exploration?

Consider the weight of the items w[1..n], value of the items v[1..n]

- ○ $F(x,v) = \max\{ F[x-w_i] + v_i \}$

- F(x,i) = max{ v_i + F[x-w_i , i-1] , F[x , i -1] }
- F(x) = max{ F[x-w_i] + v_i }
- F(x) = max{ F[x-v_i] + w_i }

Question 6

2 / 2 pts

In the o-1 knapsack recurrence formula f(x,i) = max{ v_i + f[x-w_i , i-1] , f[x , i -1] }

The first part v_i + f[x-w_i , i-1] represents : [Select]

The second part f[x , i -1] represents: [Select]

Answer 1:

adding the ith item to the knapsack

Answer 2:

not adding the ith item to the knapsack

Quiz Score: **10** out of 10