Quiz 3

Due Jan 26 at 11:59pm **Points** 8 **Questions** 8
Available Jan 18 at 11:59pm - Jan 26 at 11:59pm 8 days **Time Limit** 15 Minutes
Allowed Attempts 2

Attempt History

	Attempt	Time	Score
KEPT	Attempt 2	6 minutes	8 out of 8
LATEST	Attempt 2	6 minutes	8 out of 8
	Attempt 1	15 minutes	7 out of 8

Score for this attempt: **8** out of 8
Submitted Jan 26 at 7pm
This attempt took 6 minutes.

Question 1

1 / 1 pts

Which of the following is/are property/properties of a dynamic programming problem?

- Greedy approach
- Correct! Both optimal substructure and overlapping subproblems
- Overlapping Subproblems
- Optimal Substructure

Question 2

1 / 1 pts

In dynamic programming, the technique of storing the previously calculated values is called _____

- Mapping
- Storing value property
- Saving value property
- Correct! Memoization

Question 3

1 / 1 pts

If a problem can be solved by combining optimal solutions to non-overlapping problems, the strategy is called _____.

- Dynamic Programming
- Correct! Divide and Conquer
- Recursion
- Iteration
- Greedy

Question 4

1 / 1 pts

Which of the following standard algorithms is NOT Dynamic Programming based?

- 0-1 Knapsack problem

Fibonacci

Binomial Coefficients

Correct!

Binary Search

Question 5

1 / 1 pts

Consider the following two sequences :

X = < K, L, M, L, J, K, L >, and

Y = < L, J, M, K, L, K >

The length of the longest common subsequence of X and Y is :

5

3

2

Correct!

4

1

Question 6

1 / 1 pts

The terms in the Fibonacci sequence are given by :

$F_1 = 1,\ F_2 = 1;\quad F_n = F_{n-1} + F_{n-2}$

Consider the following recursive algorithm to calculate the nth Fibonacci number.

```
int Fib( int n)
{
```

```
    if (n <= 1)
        return n;
    return Fib(n-1) + Fib(n-2);
}
```

What is the running time of the recursive Fib? What is the running time of an efficient DP algorithm to calculate the nth Fibonacci number?

- Recursive: O(n^2) and DP : O(n)
- Recursive: Theta(2^n) and DP : Theta(n^2)
- Recursive O(4^n) and DP: O(lgn)

Correct!

- (selected) Recursive: O(2^n) and DP: Theta(n)
- Both algorithms are O(n)

Question 7

1 / 1 pts

Consider the weights and values of items below and a knapsack that can hold at most 20 lbs.

Item	Value in $	Weight in lbs
1	20	10
2	30	15
3	22	12
4	9	5
5	7	4

Assume that each item can be used at most once and can not be broken. What is the maximum value of items that can be placed in the knapsack?

- $37

Correct!

- (•) $39
- ( ) $50
- ( ) $42
- ( ) $52

Question 8

1 / 1 pts

If a dynamic programming algorithm uses an nxn table then the running time is **always :**

- ( ) O(n)
- ( ) O(n^2)

Correct!

- (•) not enough information to determine
- ( ) O(nlgn)
- ( ) O(n^3)

Quiz Score: **8** out of 8