

Quiz 3

Due Apr 19 at 11:59pm**Points** 8**Questions** 8**Available** Apr 10 at 11:59pm - Apr 19 at 11:59pm 9 days**Time Limit** 15 Minutes

This quiz was locked Apr 19 at 11:59pm.

Attempt History

	Attempt	Time	Score
LATEST	<u>Attempt 1</u>	14 minutes	8 out of 8

Score for this quiz: **8** out of 8

Submitted Apr 19 at 11:56pm

This attempt took 14 minutes.

Question 1

1 / 1 pts

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

- ☐ Overlapping Subproblems
- ☐ Greedy approach
- ☒ Both optimal substructure and overlapping subproblems
- ☐ Optimal Substructure

Correct!

Question 2

1 / 1 pts

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

Correct!

☐ Storing value property

☒ Memoization

☐ Saving value property

☐ Mapping

Question 3

1 / 1 pts

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

Correct!

☒ Divide and Conquer

☐ Greedy

☐ Dynamic Programming

☐ Recursion

☐ Iteration

Question 4

1 / 1 pts

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

Correct!

- ☐ Fibonacci
- ☐ 0-1 Knapsack problem
- ☐ Binomial Coefficients
- ☒ Binary Search

Question 5**1 / 1 pts**

Consider the following two sequences :

$X = \langle K, L, M, L, J, K, L \rangle$, and

$Y = \langle L, J, M, K, L, K \rangle$

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

- ☐ 2
- ☐ 1
- ☒ 4
- ☐ 3
- ☐ 5

Correct!**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 $O(4^n)$ and DP: $O(\lg n)$
- ☐ Both algorithms are $O(n)$
- ☐ Recursive: $\Theta(2^n)$ and DP : $\Theta(n^2)$
- ☒ Recursive: $O(2^n)$ and DP: $\Theta(n)$
- ☐ Recursive: $O(n^2)$ and DP : $O(n)$

Correct!

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?

Correct!

☒ \$39

☐ \$50

☐ \$42

☐ \$52

☐ \$37

Question 8

1 / 1 pts

If a dynamic programming algorithm uses an $n \times n$ table then the running time is **always** :

☐ $O(n)$

☐ $O(n^3)$

☒ not enough information to determine

☐ $O(n^2)$

☐ $O(n \lg n)$

Correct!

Quiz Score: **8** out of 8