

## EX 7: Theory

### Q1 Select the best definition for Dynamic Programming.

1 Point

A way of eliminating redundant code from recursive backtracking solutions.

The result of reducing redundant code to iterative solutions.

An algorithmic technique of optimizing a given algorithm by identifying the final solution as a summation of solutions to smaller sub problems.

An algorithmic design methodology of for writing recursive functions.

Save Answer

### Q2 DP Versus. Recursion I

1 Point

During the Dynamic Programming lectures, we were introduced to creating a function that calculates iterations of the Fibonacci sequence.

What was the runtime of the **recursive solution**?

$O(N)$

$O(N^2)$

$O(2^N)$

$O(2N)$

Save Answer

**Q3 DP Versus. Recursion II****1 Point**

During the Dynamic Programming lectures, we were introduced to creating a function that calculates iterations of the Fibonacci sequence.

What was the runtime of the **dynamic programming solution**?

$O(N)$

$O(N^2)$

$O(2^N)$

$O(2N)$

Save Answer

## Q4 Memory Access Types

2 Points

You are given the following piece of code:

```
public void meowing_about(int[] arr) { // arr has length 1000
    int i = 0;
    sum = 0;
    for (; i < arr.length; i++) {
        sum += arr[i];
    }
    System.out.println("wait what was arr again?" + arr[999]);
}
```

### Q4.1

1 Point

What type of locality does the following array memory access demonstrate?

```
sum += arr[i];
```

Temporal Locality

Spatial Locality

Save Answer

### Q4.2

1 Point

What type of locality does the following array memory access demonstrate?

```
System.out.println("wait what was arr again?" + arr[999]);
```

Temporal Locality

Spatial Locality

Save Answer

**Q5 What does "P" Stand for in "P vs. NP"?**

1 Point

Enter your answer in all lower-case as a single word.

**Q6 What does "NP" Stand for in "P vs. NP"?**

1 Point

Enter your answer in all lower-case as it appears in the lecture.

**Q7 What are the implications of proving  $P == NP$ ?**

1 Point

 You unlock the key to solving cancer You are able to break any cryptographic security algorithms (i.e. you can hack any bank, break any password, etc) You can speed up the process of many different existing algorithms by an extreme amount Every problem with a verifiable solution could be solved (problems in math, physics, chemistry and biology)

**Q8 NP-Complete****1 Point**

The problem B is NP-complete if B is in NP and for all problems A in NP...

...A is NP-complete.

...B reduces to A.

...A reduces to B.

...B is NP-complete.

Save Answer

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Save All Answers

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