

10 Lecture - CS402

Important Subjective

1. **What is nondeterminism in the context of computing?**

Answer: Nondeterminism refers to the property of a system or algorithm where multiple outcomes are possible for a given input or state.

How is nondeterminism different from determinism?

Answer: Determinism refers to the property of a system or algorithm where the exact outcome of an operation can be predicted with certainty, while nondeterminism allows for multiple possible outcomes.

What is a nondeterministic algorithm?

Answer: A nondeterministic algorithm is an algorithm that may produce different outputs for a given input, due to the presence of multiple possible outcomes.

How can nondeterminism be used in algorithm design?

Answer: Nondeterminism can be used to model probabilistic or uncertain systems, and can sometimes lead to faster or more efficient algorithms.

What is the nondeterministic complexity of an algorithm?

Answer: The nondeterministic complexity of an algorithm is the maximum number of steps required to solve a problem, assuming that the algorithm can make non-deterministic choices.

What is a nondeterministic decision problem?

Answer: A nondeterministic decision problem is a decision problem where the answer is either "yes" or "no", and there is a nondeterministic algorithm that can solve the problem in polynomial time.

Can a nondeterministic algorithm be implemented on a deterministic computer?

Answer: Yes, a nondeterministic algorithm can be simulated on a deterministic computer using techniques such as backtracking or guessing.

What is the difference between nondeterminism and randomness?

Answer: Nondeterminism is a property of a system or algorithm where multiple outcomes are possible, while randomness refers to the probability of a specific outcome occurring.

What are some drawbacks of using nondeterminism in algorithms?

Answer: Nondeterminism can make algorithms more complex, can lead to slower algorithms, and can produce incorrect results in some cases.

What are some advantages of using nondeterminism in algorithms?

Answer: Nondeterminism can sometimes lead to faster or more efficient algorithms, can simplify the problem being solved, and can model uncertain or probabilistic systems more accurately.