

1 Lecture - CS402

Important Subjective

1. **What is automata theory?**

Answer: Automata theory is a branch of computer science and mathematics that studies abstract machines capable of performing computations or operations automatically.

What are the different types of automata?

Answer: The different types of automata include finite automata, pushdown automata, and Turing machines.

What is the difference between a finite automaton and a pushdown automaton?

Answer: A finite automaton can handle only finite inputs, while a pushdown automaton can handle infinite inputs and has a stack to store information.

What is the purpose of a Turing machine?

Answer: The purpose of a Turing machine is to simulate any algorithm or computation that can be performed by a computer.

Can a finite automaton recognize a language that requires counting?

Answer: No, a finite automaton cannot recognize a language that requires counting, as it has limited memory and cannot store an unbounded amount of information.

What is the difference between a deterministic automaton and a non-deterministic automaton?

Answer: A deterministic automaton has a unique next state for every possible input, while a non-deterministic automaton can have multiple possible next states for a given input.

What is the Chomsky hierarchy?

Answer: The Chomsky hierarchy is a classification of formal grammars and languages into four categories based on their generative power and complexity.

What is the pumping lemma?

Answer: The pumping lemma is a theorem that provides a way to prove that a language is not regular.

What is a regular expression?

Answer: A regular expression is a sequence of characters that defines a pattern, which can be used to match or manipulate strings.

What is the relationship between automata theory and compiler design?

Answer: Automata theory provides the theoretical foundation for compiler design, as compilers use techniques such as lexical analysis and parsing, which can be modeled using automata.