6 Lecture - CS402

Important Subjective

1. **What is an equivalent FA?**
   An equivalent FA is a finite automaton that recognizes the same language as another finite automaton.

   How do you show that two FAs are equivalent?
   Two FAs are equivalent if they recognize the same language. This can be shown by constructing a state table for each FA and then comparing the tables.

   Can two FAs with different numbers of states be equivalent?
   Yes, two FAs with different numbers of states can be equivalent if they recognize the same language.

   What is the difference between a DFA and a NFA?
   A DFA is a deterministic finite automaton, while an NFA is a non-deterministic finite automaton. The main difference is that in a DFA, for each state and input symbol, there is exactly one transition, whereas in an NFA, there can be multiple transitions for the same state and input symbol.

   Can a DFA be equivalent to an NFA?
   Yes, a DFA can be equivalent to an NFA if they recognize the same language.

   How do you convert an NFA to an equivalent DFA?
   An NFA can be converted to an equivalent DFA using the subset construction algorithm. This involves constructing a DFA where the states are sets of states of the NFA.

   Can a regular expression be equivalent to a finite automaton?
   Yes, a regular expression can be equivalent to a finite automaton. In fact, any regular language can be recognized by a finite automaton and described by a regular expression.

   Can two regular expressions be equivalent?
   Yes, two regular expressions can be equivalent if they describe the same language.

   Can a context-free grammar be equivalent to a finite automaton?
   Yes, a context-free grammar can be equivalent to a finite automaton. In fact, any context-free language can be recognized by a finite automaton and generated by a context-free grammar.

   Can two context-free grammars be equivalent?
   Yes, two context-free grammars can be equivalent if they generate the same language.