

# 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.