CS310

Converting NFA to DFA

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NFA-DFA equivalence

Th 1.39: Every NFA has an equivalent DFA

Corollary: A language is regular if and only if there exists an NFA that recognizes it

Proof:

If the language is regular, there exists a DFA that recognizes it. Each DFA is an NFA. Conversely, if there exists an NFA that recognizes the language, convert the NFA to a DFA.

Proof with NFAs

Theorem 1.25: The class of regular languages is closed under the union operation.

We proved this using DFAs

What was the computation the new DFA simulated?

Is it any easier to prove using NFAs?

Proof with NFAs

Regular languages are closed under concatenation

this is where we stopped using DFAs

what made this hard for DFAs?

Practice

Construct an NFA to recognize concatenation of DFAs

A = { w | w contains at least three1s}

B = { w | w begins with two 1s }

Proof with NFAs

Regular languages are closed under Kleene star

What is Kleene star?

Practice

Construct an NFA to recognize Kleene star of A if A= { w | w contains at least two 0s and at most one 1}