

Lecture #9: Regular Expressions, Part Two

Assumptions

- Preliminary material for this lecture has been reviewed.

Objective

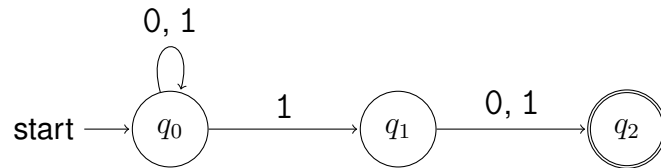
Become more familiar with the process to produce a **regular expression** for the language of a given nondeterministic finite automaton.

Questions for Review

1. What is a **generalized nondeterministic finite automaton (GNFA)**? How is it different from a “nondeterministic finite automaton?”
2. Describe a process that can be used to convert either a deterministic finite automaton or a nondeterministic finite automaton into a generalized nondeterministic finite automaton with the same language.
3. Suppose that a generalized nondeterministic finite automaton has at least three **states**. Describe a process you can follow to produce a generalized nondeterministic finite automaton, with one fewer state, that has the same language.
4. Describe one or more **simplification rules** that can be used to make generalized nondeterministic finite automata (and the expressions that label their transitions) simpler than they otherwise would be.
5. Suppose you have a generalized nondeterministic finite automaton with only two states. How can a regular expression with the same language be obtained?
6. What does all of this prove about the set of languages that are the languages of regular expressions?

Problem To Be Solved:

Let $\Sigma = \{0, 1\}$. Our goal will be to construct a regular expression with the same language as the following nondeterministic finite automaton.



How To Solve This

Solution:

Breakout Session

The results are in! The 2021 Grand Prize Winner of the ***Bulwer Lytton Fiction Contest*** has now been chosen:

“A lecherous sunrise flaunted itself over a flatulent sea, ripping the obsidian bodice of night asunder with its rapacious fingers of gold, thus exposing her dusky bosom to the dawn’s ogling stare.”

Of course, this might make more sense if you know what the “Bulwer Lytton Fiction Contest” actually *is*. A link to information about this is now available.

Questions that might arise, and serve as a basis for discussion, might include the following.

1. Should this ***really*** have won? (Can you do better?)
2. How does the existence of the “Bulwer Lytton Fiction Contest” effect general mental health?
3. What impact might the “Bulwer Lytton Fiction Contest” have on world peace?