

Ars Digita University

Theory of Computation

Recitation 3, 05/06/01

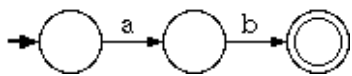
Topics

- The Java Computability Toolkit.
- More on Regular Expressions.
- GNFA's and converting an NFA to a regular expression.
- Converting a Regular Expression to an NFA.
- Diagonalization.
- The Pumping Lemma.

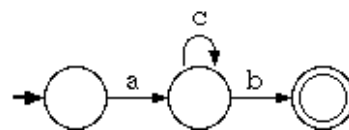
Problems to work on

- (Warm up) Give one string that is in the language and one that is not:
 - a^*b^*
 - $a(ba)^*b$
 - $a^* + b^*$
 - $(b + aaa)^*$
 - $aba + bab$
- Write a regular expression
 - That accepts the set of all strings.
 - That accepts the set of all strings not containing 00 as a substring.
- Convert to regular expressions:

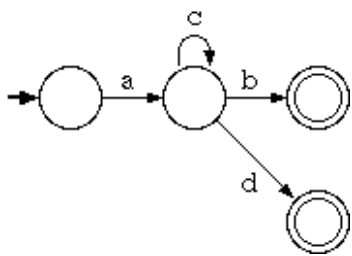
a)



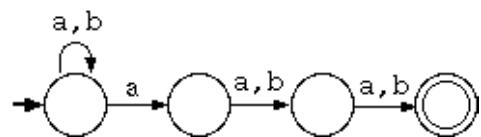
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c)

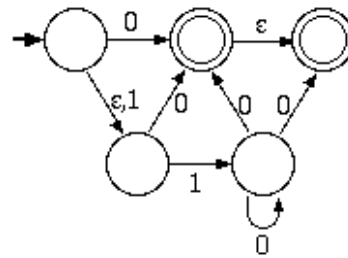
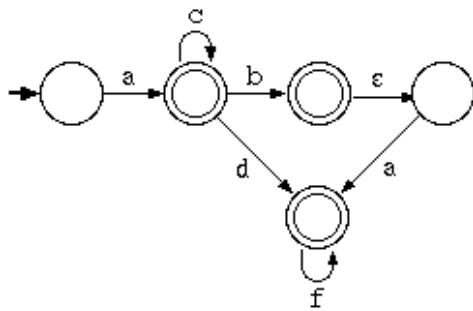


d)

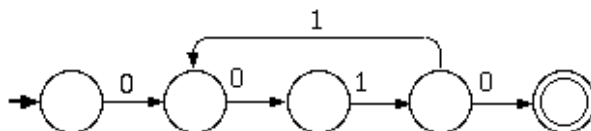


e)

f)



g)



4. Convert to an NFA:

1. $(001)^*(1+e)$ 2. $(01^*0 + e + 00)$ 3. $(001)^*(1+e)(01^*0 + e + 00)$

5. How long does a string in the following language have to be before we are guaranteed to have a loop?

6. Is the set of all strings that are palindromes regular? Why or why not?

7. Show that the set of all strings of zeros that have length that is a perfect cube can not be described by a regular expression.

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