CSCI 447 – Fall 2000

Scanning Theory

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Due Date: Wednesday, September 27, 2000

1. Write regular expressions for the following character sets

a. All strings of lowercase letters that begin and end in *a*.

b. All strings of digits that contain no leading zeros.

c. All strings of digits that represent even numbers.

d. All strings of *a*'s and *b*'s that contain no three consecutive *b*'s.

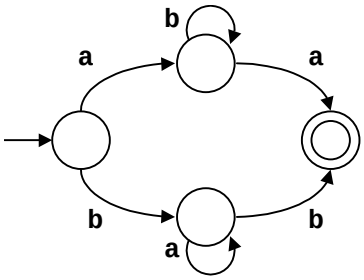
2. Draw DFAs that accept the following:

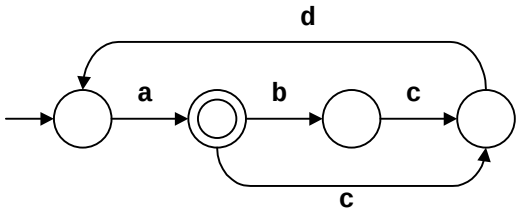
a. Four reserved words **`case`**, **`char`**, **`const`**, and **`continue`**

b. All strings of *a*'s and *b*'s that contain an even number of *a*'s and an even number of *b*'s

c. **`(a|(bc)*d)+`**

3. Write regular expressions that correspond to the following DFAs:





4. Write a regular expression for a C comment surrounded by **`/*`** and **`*/`**. Individual **`/`** and **`*`** may appear inside the comment, but not **`*/`**.

5. **a.** Use Thompson's construction to convert the regular expression **`(aa|b)*(a|bb)*`** into an NFA.

b. Convert the NFA of part (a) into a DFA using the subset construction method.