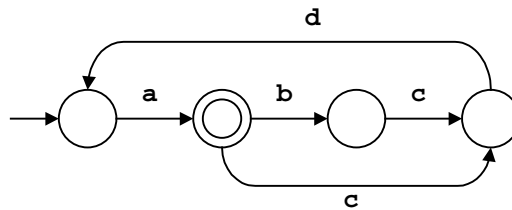
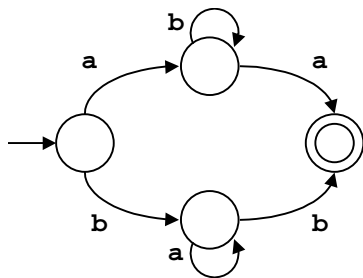


CSCI 447 – Spring 2001

Assignment 1: Scanning Theory

Professor: Muhammed F. Mudawwar
Due Date: Tuesday, February 27, 2001

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 one or more digits that contain no leading zeros.
 - c. All strings of one or more 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 the variation of Thompson's construction, described in the lecture notes, 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.
 - c. Minimize the DFA obtained in part (b).