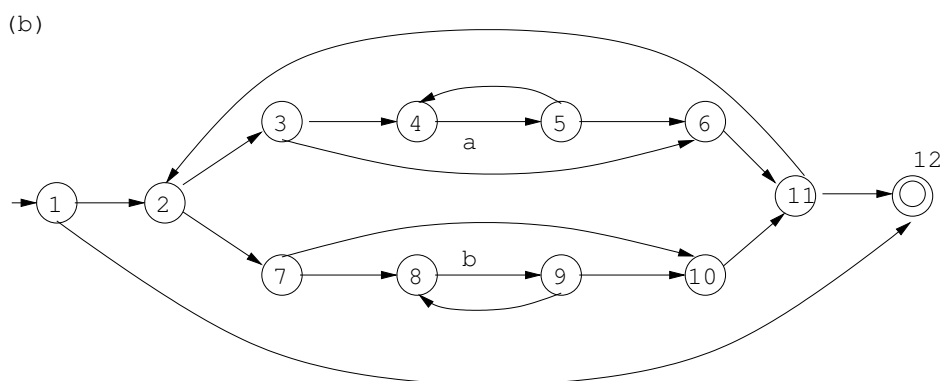
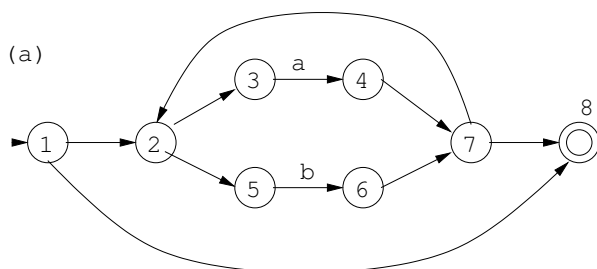
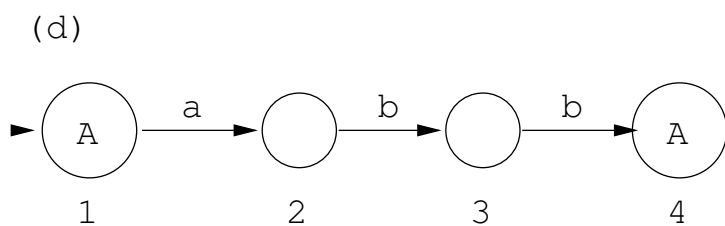
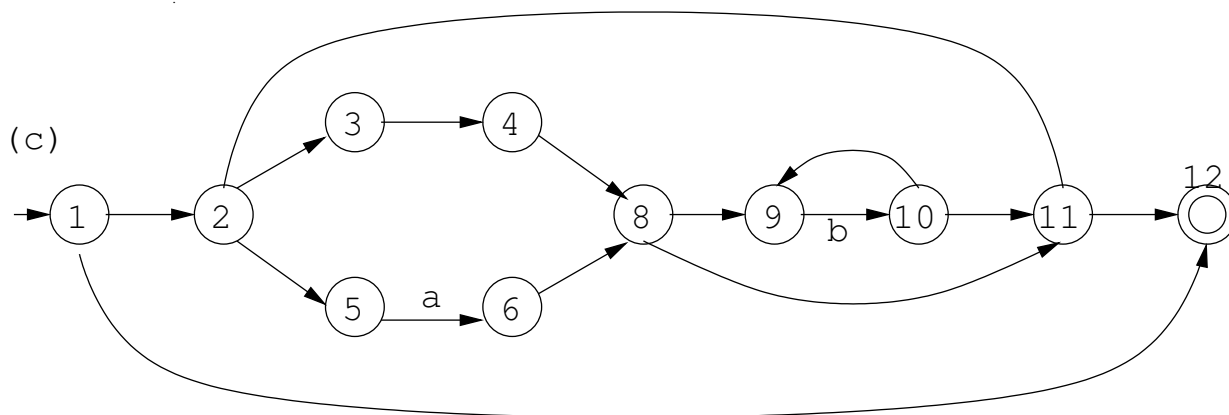


Tutorial 1: Solutions

CSC 467 Compilers and Interpreters
Fall Semester, 2005

1. Unmarked edges denote ϵ -transitions.



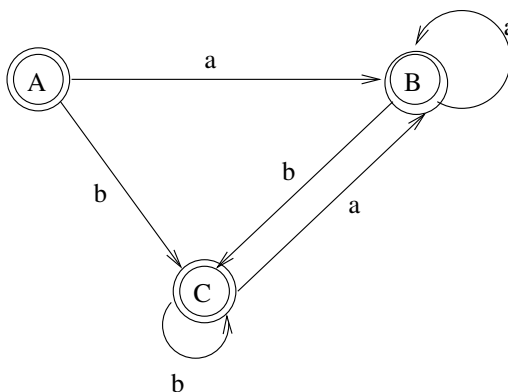


where A is defined in part (a).

The sequence of moves in processing the string *ababbab* is for each NFA:

- (a) 1-2-3-4-7-2-5-6-7-2-3-4-7-2-5-6-7-2-5-6-7-2-3-4-7-2-5-6-7-8
- (b) 1-2-3-4-5-6-11-2-7-8-9-10-11-2-3-4-5-6-11-2-7-8-9-8-9-10-11-2-3-4-5-6-11-2-7-8-9-10-11-12
- (c) 1-2-5-6-8-9-10-11-2-5-6-8-9-10-9-10-11-2-5-6-8-9-10-11-12
- (d) A1-A2-A3-A4-A5-A6-A11-A2-A7-A8-A9-A10-A11-A12-2-3-(repeat A sequence).

2. Both parts have the same diagram:



(a)

DFA State	NFA States
A	{1,2,3,5,8}
B	{2,3,4,5,7,8}
C	{2,3,5,6,7,8}

	DFA State	NFA States
(c)	A	{1,2,3,4,5,8,9,11,12}
	B	{2,3,4,5,6,8,9,11,12}
	C	{2,3,4,5,8,9,10,11,12}

Moves are A,B,C,B,C,C,B,C

3. (a) $[a-zA-Z]^*[aA][a-zA-Z]^*[eE][a-zA-Z]^*[iI][a-zA-Z]^*[oO][a-zA-Z]^*[uU][a-zA-Z]^*$
 (b) $a^*b^*\dots z^*$
 (c) $1^*(0^+1)^*o^*$ or $1^*(0^+1^?)^*$
 (d) $1^*0^*1^?0^*$
 (e) $(0^?0^?1)^*000(10^?0^?)^*$
4. (a) $(a|b)^*b$
 (b) $(a(bc^?)^?)^*abc$
 (c) $(p|q)^*r$
5. We have used the notational conventions described on pages 166-7.
 (a) $S \rightarrow aSb|aSbb|\epsilon$
 (b) $S \rightarrow aSa|bSb|a|b$
 (c) $S \rightarrow SaSbSbS|SbSaSbS|SbSbSaS|\epsilon$