

BLG 311E – FORMAL LANGUAGES AND AUTOMATA
 SPRING 2017
 HOMEWORK 5

1. Consider the regular expression $(a \vee b)^* abb(a \vee b)^*$.
 - a. Construct and draw the NFA accepting the regular expression.
 - b. Construct and draw the DFA for this NFA.
 - c. Reduce the DFA if necessary.

2. Consider the following state transition diagram of DFA in Moore model.

	a	b	c	Output
q0	q1	q7	q7	1
q1	q2	q3	q4	0
q2	q2	q5	q7	0
q3	q6	q3	q7	0
q4	q3	q2	q7	0
q5	q1	q7	q7	1
q6	q1	q7	q7	1
q7	q7	q7	q7	0

$$\begin{aligned}
 K &= \{q0, q1, q2, q3, q4, q5, q6, q7\} \\
 F &= \{q0, q5, q6\} \\
 s &= \{q0\} \\
 \Sigma &= \{a, b, c\}
 \end{aligned}$$

- a. Reduce the table if necessary. Draw the state transition diagram of the (reduced) DFA.
- b. Which ones of the following regular expressions are accepted by this DFA?
 - i. $L(M) = \{a[(b \vee ca)b^* a \vee (a \vee cb)a^*b]^*\}$
 - ii. $L(M) = \{a[(b \vee ca)b^* a \vee (a \vee cb)a^*b]^+\}$
 - iii. $L(M) = \{a[(b \vee c)b a \vee (a \vee cb)ab]^*\}$

IMPORTANT: You must do this homework by hand and submit it using the box in the department secretariat.