CS581 Theory of Computation: Homework #1

Due on January 20 2015 at 2:00pm

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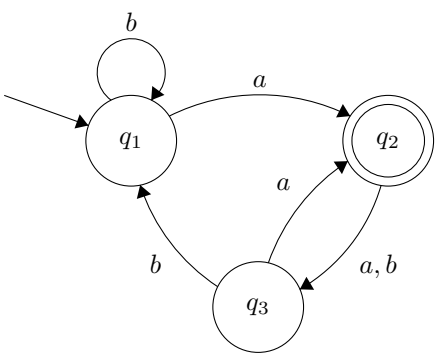
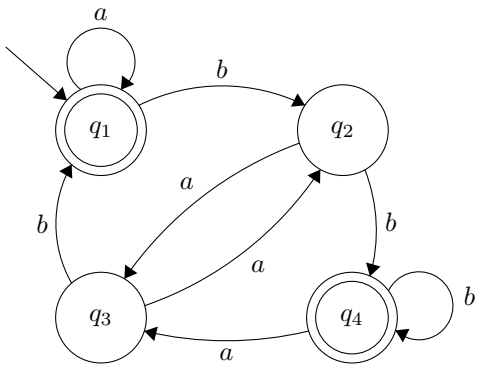
Problem 1



M_1



M_2

a. Start State: M_1 - q_1, M_2 - q_1
b. Set of accept states M_1 - $F = \{q_2\}$, M_2 - $F = \{q_1, q_4\}$,
c. $M_1 = \{q_1, q_2, q_3, q_1, q_1\}$, $M_2 = \{q_1, q_1, q_1, q_2, q_4\}$
d. M_1 No, M_2 Yes
e. M_1 No, M_2 Yes

Problem 2

M_1

1. $Q = \{q_1, q_2, q_3\}$
2. $\sum = \{a, b\}$
3. δ described as

Table 1: M_1 Transition function

	a	b
q_1	q_2	q_1
q_2	q_3	q_3
q_3	q_2	q_1

4. Start state $q_1 \in Q$
5. $F = \{q_3\} \subseteq Q$ Start state $q_1 \in Q$

M_2

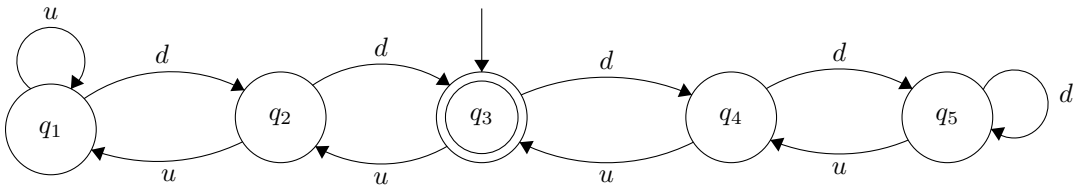
1. $Q = \{q_1, q_2, q_3, q_4\}$
2. $\sum = \{a, b\}$
3. δ described as

Table 2: M_2 Transition function

	a	b
q_1	q_1	q_2
q_2	q_3	q_4
q_3	q_2	q_1
q_4	q_3	q_4

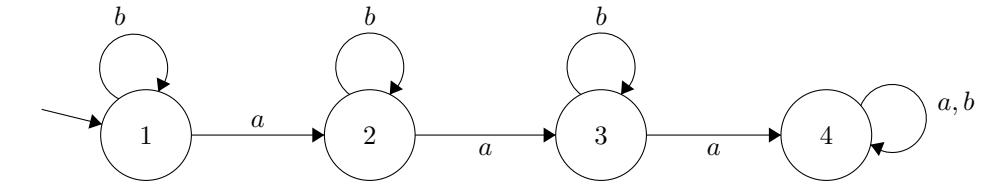
4. Start state $q_1 \in Q$
5. $F = \{q_1, q_4\} \subseteq Q$ Start state $q_1 \in Q$

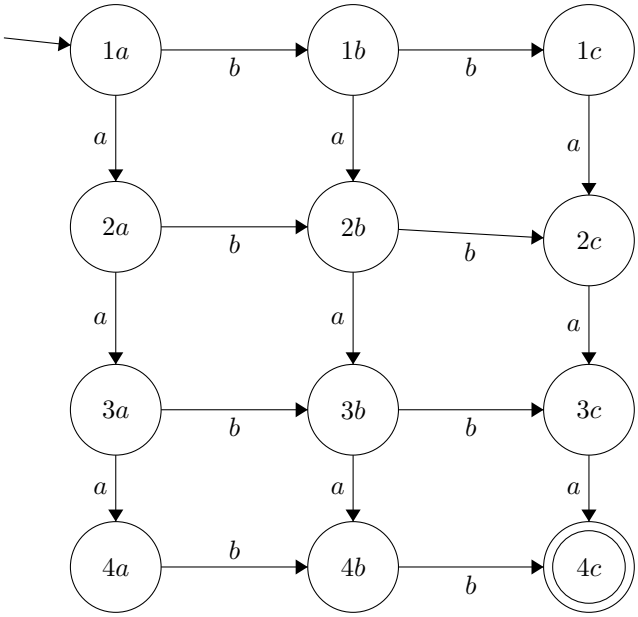
Problem 3

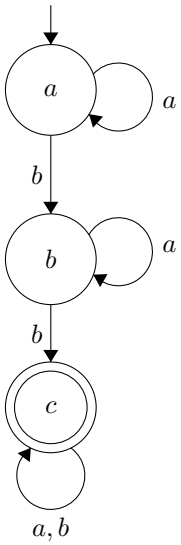


Problem 4

a


b
b
b
1
a
2
a
3
a
4
a, b


1a
1b
1c
2a
2b
2c
3a
3b
3c
4a
4b
4c
a
b


a
a
b
b
a
b
c
a, b