

Exercises #2

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Exercise 1.1

- a. $M_1: q_1$
 $M_2: q_1$
- b. $M_1: \{q_2\}$
 $M_2: \{q_1, q_4\}$
- c. $M_1: q_1 \rightarrow q_2 \rightarrow q_3 \rightarrow q_1 \rightarrow q_1$
 $M_2: q_1 \rightarrow q_1 \rightarrow q_1 \rightarrow q_2 \rightarrow q_4$
- d. M_1 : No
 M_2 : Yes
- e. M_1 : No
 M_2 : Yes

Exercise 1.2

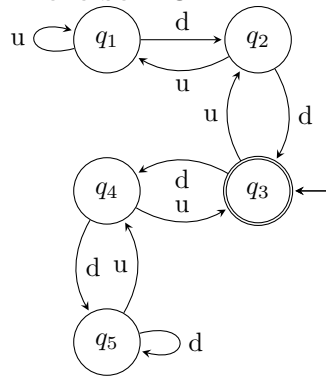
$M_1 = (\{q_1, q_2, q_3\}, \{a, b\}, \delta_1, q_1, \{q_2\})$

$M_2 = (\{q_1, q_2, q_3, q_4\}, \{a, b\}, \delta_2, q_1, \{q_1, q_4\})$

δ_1	a	b
q_1	q_2	q_1
q_2	q_3	q_3
q_3	q_2	q_1

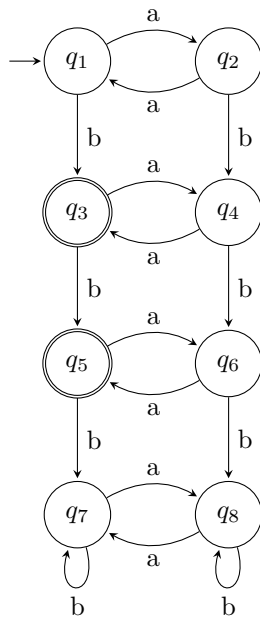
δ_2	a	b
q_1	q_1	q_2
q_2	q_3	q_4
q_3	q_2	q_1
q_4	q_3	q_4

Exercise 1.3

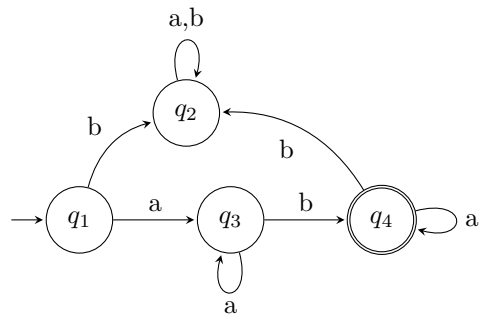


Exercise 1.4

c.



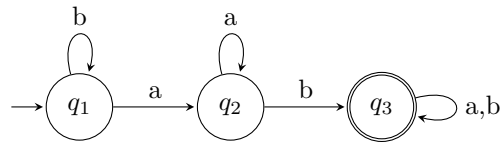
e.



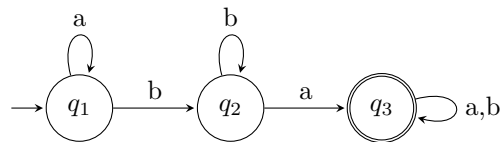
Exercise 1.5

c.

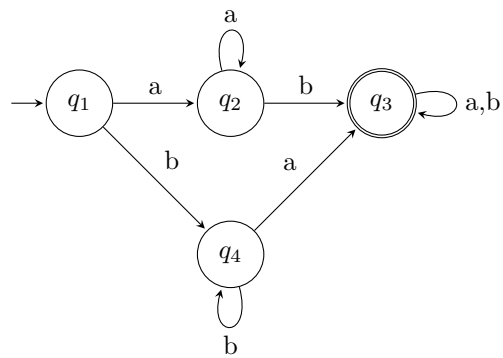
$\{w \mid w \text{ contains the string } \mathbf{ab}\}$



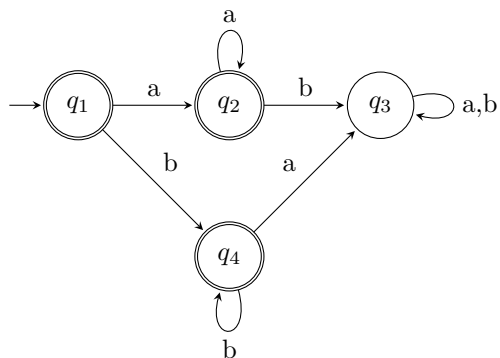
$\{w \mid w \text{ contains the string } \mathbf{ba}\}$



$\{w \mid w \text{ contains the string } \mathbf{ab} \text{ or the string } \mathbf{ba}\}$

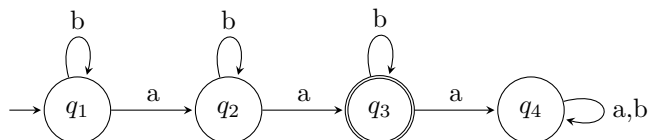


$\{w \mid w \text{ does not contain the string } \mathbf{ab} \text{ nor the string } \mathbf{ba}\}$

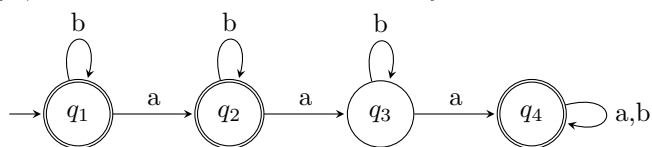


g.

$\{w \mid w \text{ contains exactly two a's}\}$



$\{w \mid w \text{ doesn't contains exactly two a's}\}$



Exercise 1.7

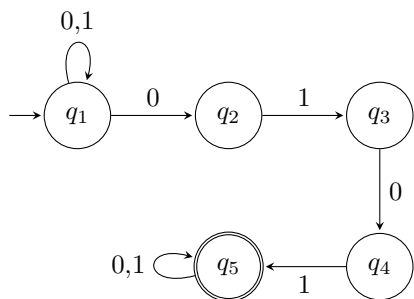
a.

$\{w \mid w \text{ ends with } 00\}$



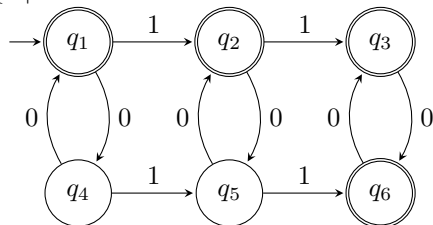
b.

$\{w \mid w \text{ contains the substring } 0101\}$



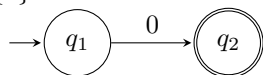
c.

$\{w \mid w \text{ contains an even number of 0's or exactly two 1's}\}$



d.

$\{0\}$



g.

$\{\epsilon\}$

