CMSC 141 Automata and Language Theory

Regular Languages

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DFA NFA Comparison

DFA

States has exactly one exiting transition for each input symbol

Transition function:

$\delta(Q, a) \rightarrow Q$

e.g.

$\delta(q_0, a) = q_1$

$\delta(q_0, b) = q_2$

NFA

States can have zero, one, or many exiting transition for each input symbol

Transition function:

$\delta(Q, a) \rightarrow P(Q)$

e.g.

$\delta(q_0, a) = \{q_1, q_2\}$

$\delta(q_0, b) = \emptyset$

Quiz :)

Quiz :)

Create automata for

$L_1 = \{w | w \text{ have a substring aa or bb}\}$
$L_1 = \{aa, bb, aaa, baa, aab, bbb, abb, bba, abba, ...\}$

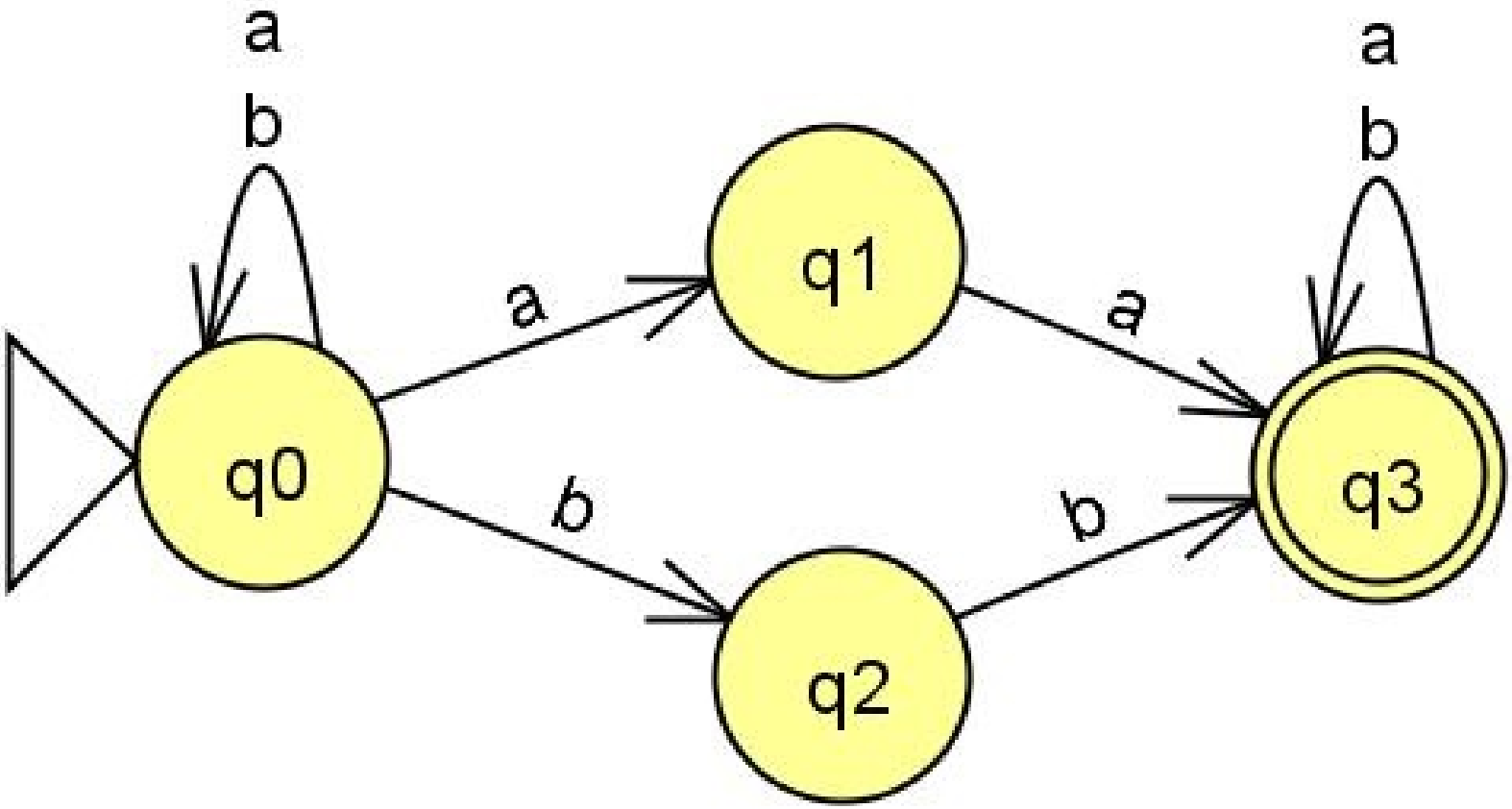
Quiz :)

Create automata for

$L_1 = \{w | w \text{ have a substring aa or bb}\}$
$L_1 = \{aa, bb, aaa, baa, aab, bbb, abb, bba, abba, ...\}$

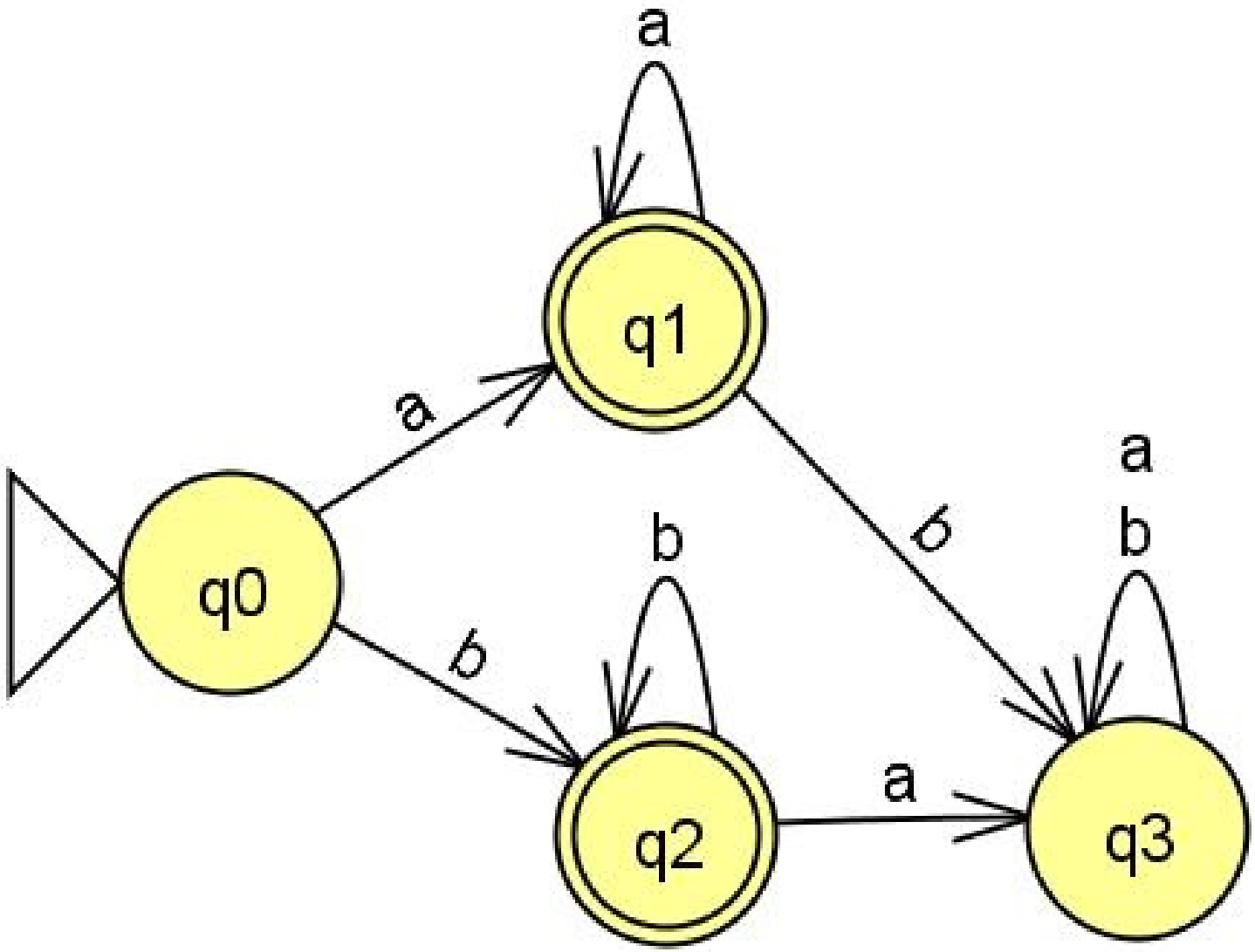
$L_2 = \{w | w \text{ have all a's or all b's}\}$
$L_2 = \{a, b, aa, bb, aaa, bbb, aaaa, bbbb, ...\}$

Answers



$L_1 = \{w | w$ have a substring aa or bb$\}$

Answers



$L_2 = \{w | w \text{ all a's or all b's}\}$