Mathematical Methods for Computer Science 2 Fall 2017

Series 7

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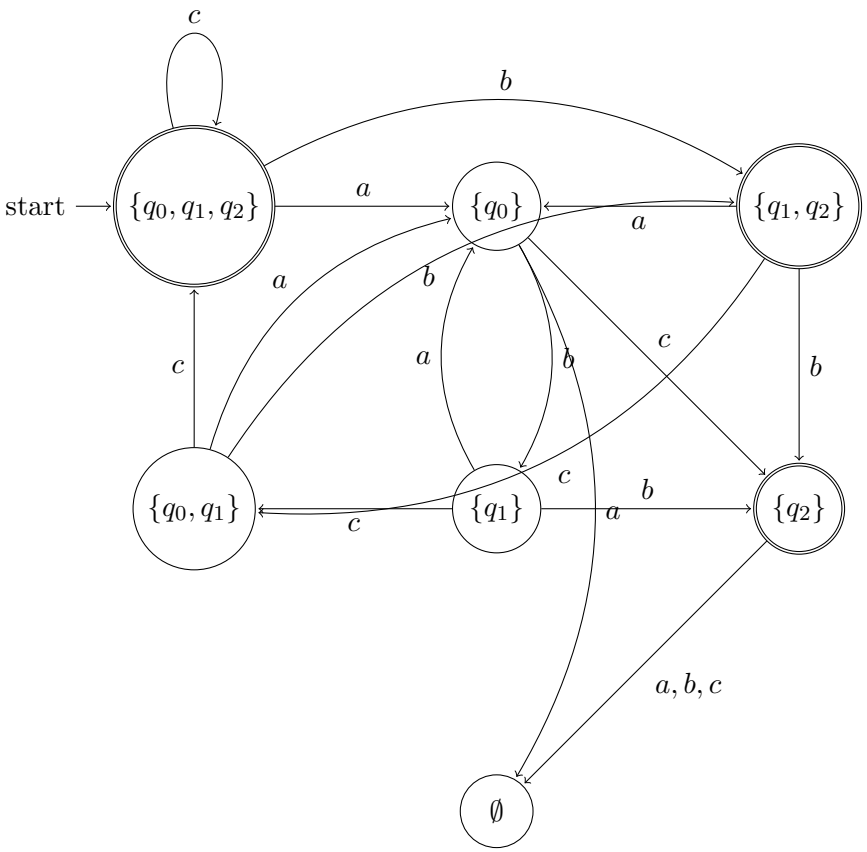
1

$$q_0' = \{q_0\} = \{q_0, q_1, q_2\}$$

	a	b	c
$\{q_0, q_1, q_2\}$	$\{q_0\}$	$\{q_1, q_2\}$	$\{q_0, q_1, q_2\}$
$\{q_0\}$	$\emptyset$	$\{q_1\}$	$\{q_2\}$
$\{q_1, q_2\}$	$\{q_0\}$	$\{q_2\}$	$\{q_0, q_1\}$
$\{q_0, q_1\}$	$\{q_0\}$	$\{q_1, q_2\}$	$\{q_0, q_1, q_2\}$
$\{q_1\}$	$\{q_0\}$	$\{q_2\}$	$\{q_0, q_1\}$
$\{q_2\}$	$\emptyset$	$\emptyset$	$\emptyset$
$\emptyset$	$\emptyset$	$\emptyset$	$\emptyset$



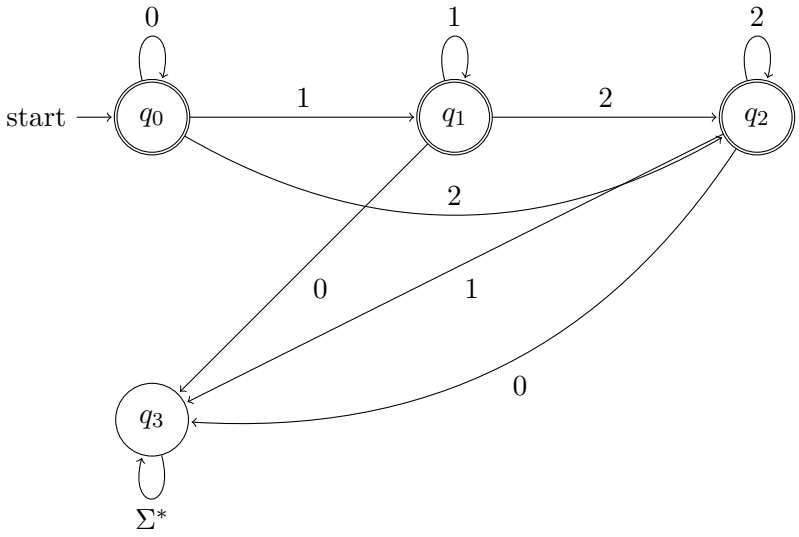
2

No answer.

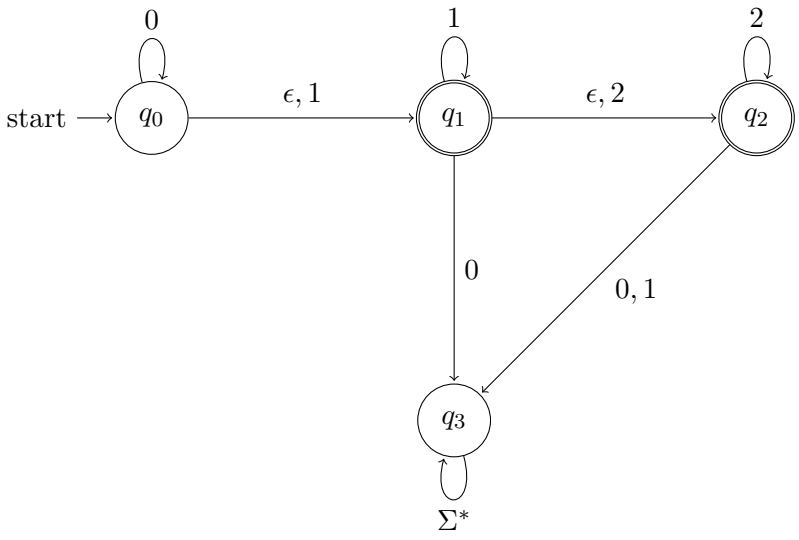
3

We denote by Σ^* any possible symbol from the alphabet.

DFA :



ϵ-NFA :



4

(a)

$$(0+1)^*11(0+1)^*$$

(b)

$$(0+1)^*0(0+1)^*0(0+1)^*$$

(c)

$$1^*01^*01^*$$

(d)

$$(1^*01^*01^*)^*$$

5

(a)

Any number (represented by the length of a word in a unary alphabet) which can be represented by bill of 17 and 31. For example, $17 = 1 \cdot 17 + 0 \cdot 31$ or $175 = 3 \cdot 17 + 4 \cdot 31$.

(b)

Any binary word of 0 and 1, including the empty word.

(c)

The words of alternating sequence of 0 and 1 which ends by a 1.