Algorithms & Models of Computation CS/ECE 374, Fall 2020

3.1.2

Formal definition of DFA

Definition

A deterministic finite automata (DFA) $M = (Q, \Sigma, \delta, s, A)$ is a five tuple where

Σ is a finite set called the input alphabet,

ullet $\delta: Q imes \Sigma o Q$ is the transition function

ullet $s\in Q$ is the start state,

ullet $A\subseteq Q$ is the set of accepting/final states.

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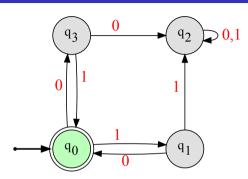
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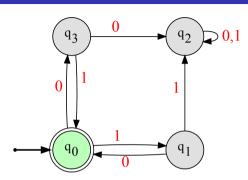
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DFA Notation

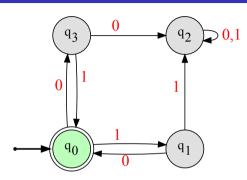
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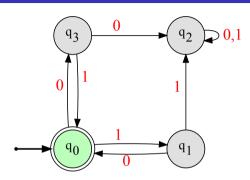
- $Q = \{q_0, q_1, q_1, q_3\}$
- $\Sigma = \{0, 1\}$
- 6
- $s = q_0$
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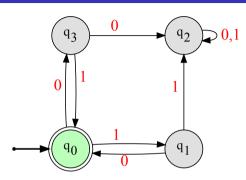
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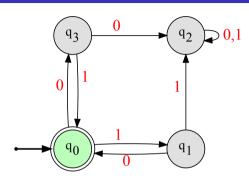
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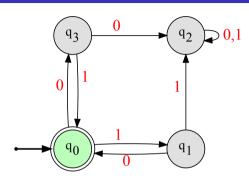
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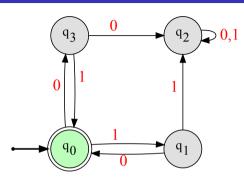
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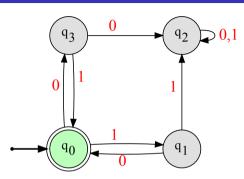
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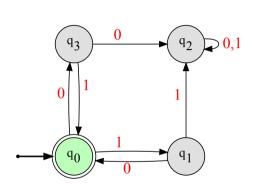


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Example: The transition function





state	input	result
q	C	$\delta(q,c)$
Q	Σ	Σ
$\overline{m{q}_0}$	0	q_3
$oldsymbol{q}_0 \ oldsymbol{q}_0$	1	$oldsymbol{q}_1$
$oldsymbol{q}_1$	0	\boldsymbol{q}_0
$oldsymbol{q}_1$	1	\boldsymbol{q}_2
\boldsymbol{q}_2	0	\boldsymbol{q}_2
$oldsymbol{q}_2 \ oldsymbol{q}_2$	1	$egin{pmatrix} oldsymbol{q}_2 \ oldsymbol{q}_2 \end{array}$
$egin{array}{c} oldsymbol{q}_3 \ oldsymbol{q}_3 \end{array}$	0	$egin{pmatrix} oldsymbol{q}_2 \ oldsymbol{q}_0 \end{matrix}$
\boldsymbol{q}_3	1	\boldsymbol{q}_0

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THE END

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(for now)