CS310

Moore Machines

Mealy Machines

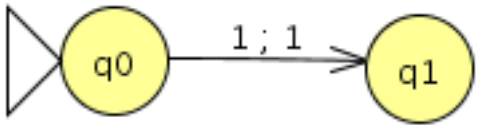
(Finite State Transducer p 87 1.24)

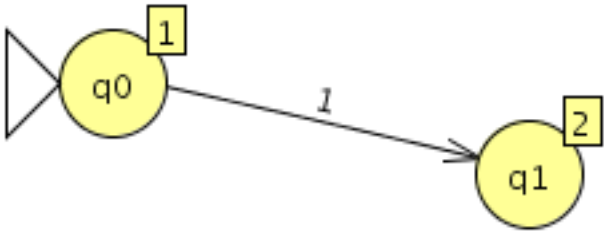
September 24, 2010

Description

- Machines that produce **output**
- Can represent sequential circuits (has memory)

- No accept states
- Deterministic
- Mealy (FST)
  - produce output on transition
    input ; output
- Moore
  - produce output on state entry
- Input and output alphabet may differ





$\Sigma=\{0,1\}$

Example

- Count how many times the substring 110 appears in an input string

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- What should the output look like?

- Can you do this with both machines?
  - Does either machine work better for this?

$\Sigma=\{0,1\}$

Example

- Count how many times the substring 101 appears in an input string

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- What should the output look like?

- Can you do this with both machines?
  - Does either machine work better for this?

$\Sigma=\{0,1\}$

Example

- Transform a binary string into its complement: 001 becomes 110

- Does either machine work better for this?

$\Sigma=\{0,1\}$

1.27 p 88

- Output string is identical to input string on the even positions, inverted on odd positions

Practice

- $\Sigma = \left\{\begin{bmatrix}0\\0\end{bmatrix}, \begin{bmatrix}1\\0\end{bmatrix}, \begin{bmatrix}0\\1\end{bmatrix}, \begin{bmatrix}1\\1\end{bmatrix}\right\}$ Add the top and bottom rows of input to produce a binary number as output.

The binary numbers are input 1's place first.

$\Sigma=\{0,1\}$

Practice

- Convert binary number, 4 bits at a time, to hexadecimal digit

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(read binary number 1's place first.)