Assignment 4

Automata & Theory of Computation

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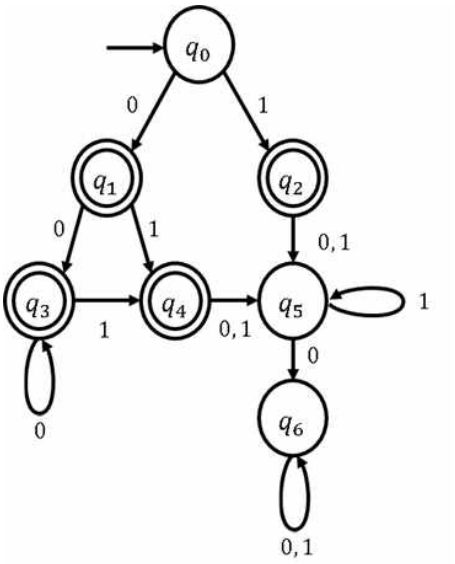
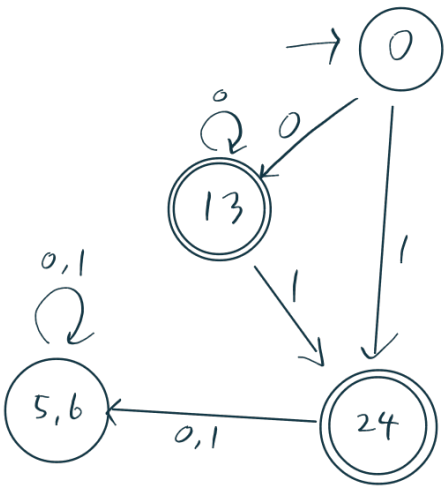
1. Partition the following dfa's state set into indistinguishable state sets, and reduce the following dfa to the minimal dfa.

(1)





$|w| = 0$

- $w = \lambda$

  $\{0, 5, 6\}, \{1, 3, 4, 2\}$

$|w| = 1$

- $w = 0$

  $\{0\}, \{5, 6\}, \{1, 3\}, \{4, 2\}$

- $w = 1$

  $\{0\}, \{5, 6\}, \{1, 3\}, \{4, 2\}$

$|w| = 2$

- $w = 00$

  $\{0\}, \{5, 6\}, \{1, 3\}, \{4, 2\}$

- $w = 01$

  $\{0\}, \{5, 6\}, \{1, 3\}, \{4, 2\}$

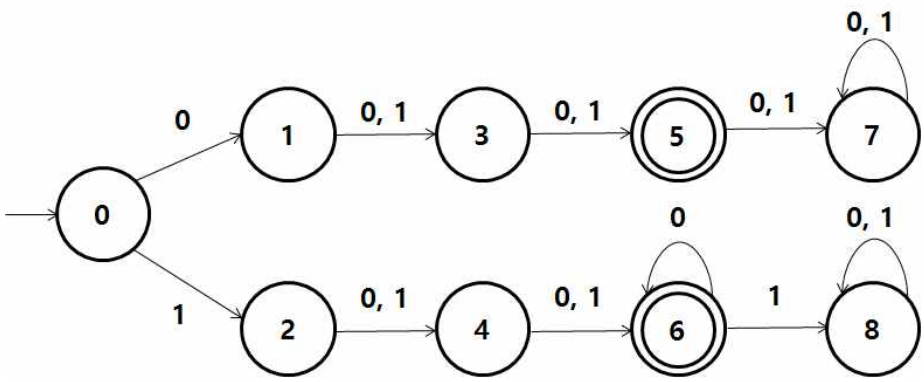
- $w = 10$

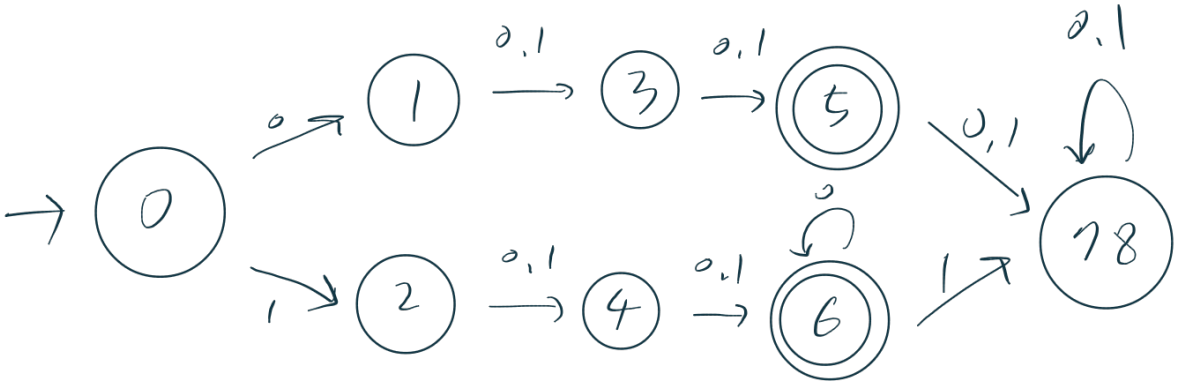
  $\{0\}, \{5, 6\}, \{1, 3\}, \{4, 2\}$

- $w = 11$

  $\{0\}, \{5, 6\}, \{1, 3\}, \{4, 2\}$

(2)


0, 1
0
1
0, 1
3
0, 1
5
0, 1
7
0
0
0, 1
1
2
0, 1
4
0, 1
6
1
8


0, 1
0
1
0, 1
3
0, 1
5
0, 1
0
0
1
2
0, 1
4
0, 1
6
1
7 8

- $|w| = 0$
  - $w = \lambda$

    $\{0, 1, 2, 3, 4, 7, 8\}$, $\{5, 6\}$
- $|w| = 1$
  - $w = 0$

    $\{0, 1, 2, 7, 8\}, \{3, 4\}, \{5\}, \{6\}$
  - $w = 1$

    $\{0, 1, 2, 7, 8\}$, $\{3, 4\}$, $\{5\}$, $\{6\}$
- $|w| = 2$
  - $w = 00$

    $\{0, 7, 8\}, \{1, 2\}, \{3\}, \{4\}, \{5\}, \{6\}$
  - $w = 01$

    $\{0, 7, 8\}$, $\{1, 2\}$, $\{3\}$, $\{4\}$, $\{5\}$, $\{6\}$
  - $w = 11$

    $\{0, 7, 8\}$, $\{1, 2\}$, $\{3\}$, $\{4\}$, $\{5\}$, $\{6\}$

  ⋮
- $|w| = 3$
  - $w = 000$

    $\{0\}, \{7, 8\}, \{1\}, \{2\}, \{3\}, \{4\}, \{5\}, \{6\}$.