CS/ECE 374 P05

Jiawei Tang, Junquan Chen, Pengxu Zheng

TOTAL POINTS

100 / 100

QUESTION 1

1 Problem 5.A. **60 / 60**

✓ **- 0 pts** Correct

QUESTION 2

2 Problem 5.B. **40 / 40**

✓ **- 0 pts** Correct

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HW2 Solution

CS/ECE 374: Algorithms & Models of Computation, Spring 2019 Version: **1.0**

Submitted by:

- ≪**Pengxu Zheng**≫: ≪**pzheng5**≫
- ≪**Junquan Chen**≫: ≪**junquan2**≫
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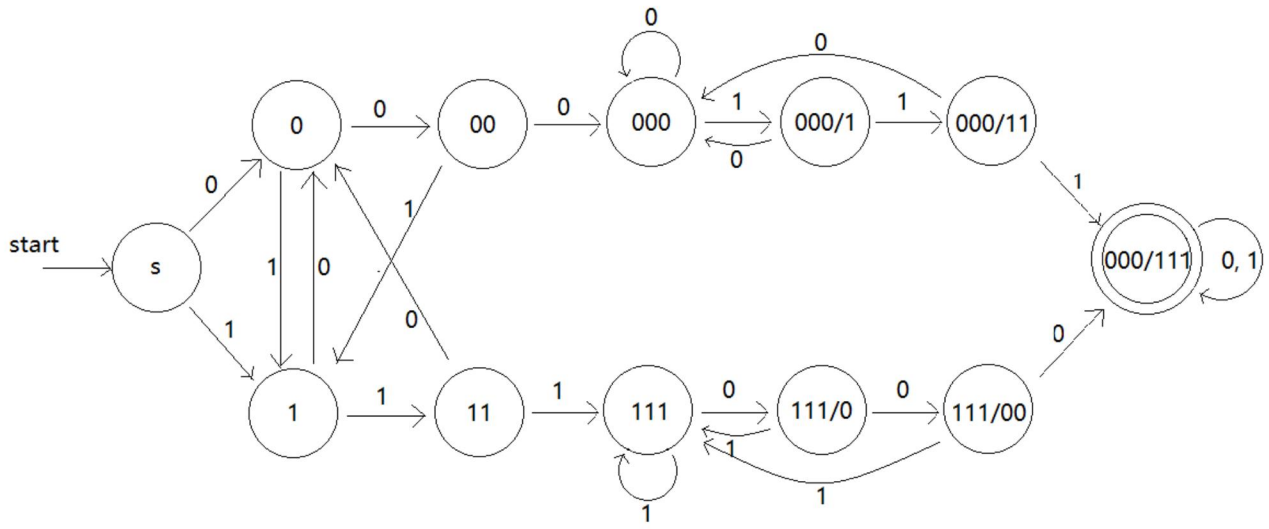
5

Solution:

5.A.

The graph drawn below represents the DFA over alphabet $\Sigma = \{0, 1\}$ that accepts language L.



Explanation of States:
s: starting state
0, 1: there is at least one 0/1 in the language
00, 11: there exist at least one pattern of two consecutive 1/0s
000, 111: there exist at least one pattern of three consecutive 1/0s
000/1: there exist at least one pattern that consists of three 0s consecutively and one 1.
111/0: there exist at least one pattern that consists of three 1s consecutively and one 0.
000/11: there exist at least one pattern that consists of three 0s consecutively and two 1s consecutively.
111/00: there exist at least one pattern that consists of three 1s consecutively and two 0s consecutively.
000/111: the final, accepted state that consists of three 1s consecutively and three 0s consecutively.

Q = {s, 0, 1, 00, 11, 000, 111, 000/1, 111/0, 000/11, 111/00, 000/111}
s = {s} A = {000/111}

5.B

(0+1)* 000 (0+1)* 111 (0+1)* + (0+1)* 111 (0+1)* 000 (0+1)*

The two patterns 000 and 111 could appear at any location in the language, so we decided to insert both patterns seperately into the power set of languages containing 0s and 1s. Since both patterns of 000 and 111 could appear in the language first, we have unioned both possibilities.

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✓ **- 0 pts** **Correct**

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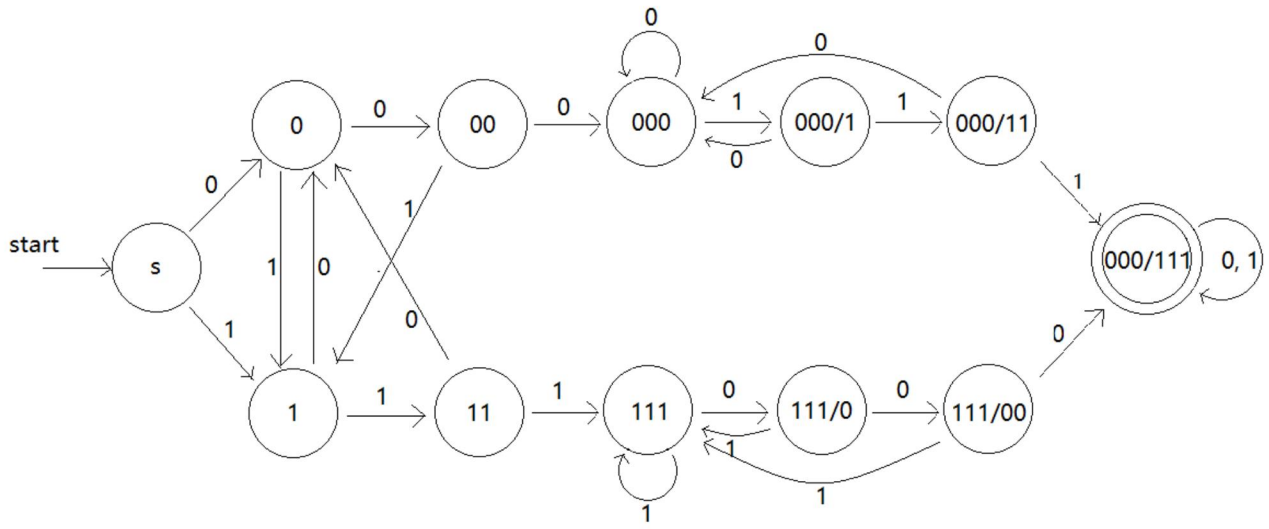

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s = {s} A = {000/111}

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2 Problem 5.B. 40 / 40

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