CS338 HW1

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1

1.1 State Diagrams of DFA

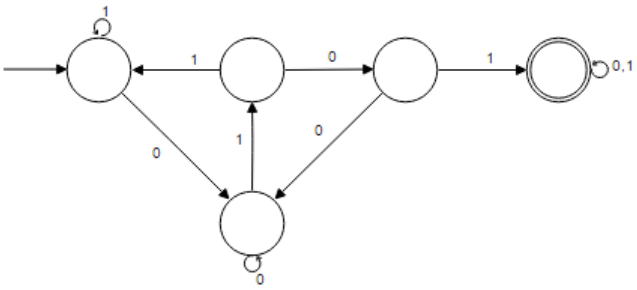

Figure 1: {w|w contains the substring 0101 (i.e., w = x0101y for some x and y)}

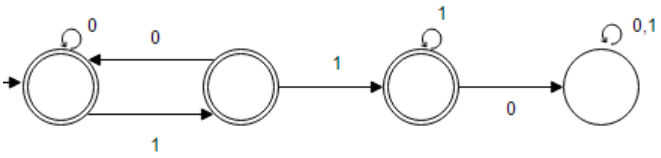

Figure 2: {w|w doesn't contain the substring 110}

1.2 State Diagrams of NFA

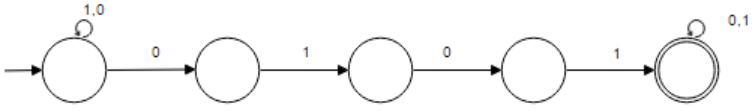

Figure 3: {w|w contains the substring 0101 (i.e., w = x0101y for some x and y)}

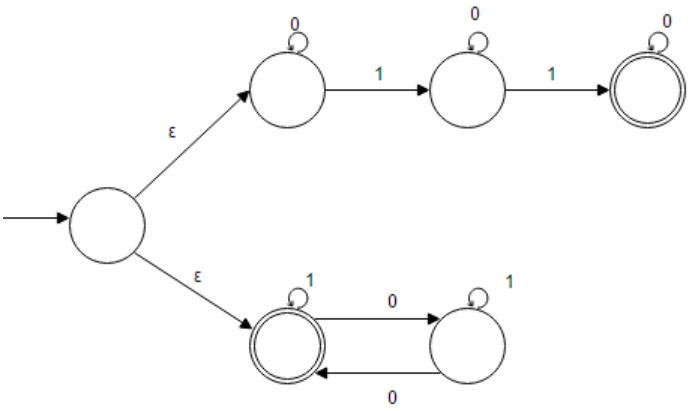

Figure 4: {w|w has either an even amount of 0's or exactly 2 1's}

2 NFA to DFA

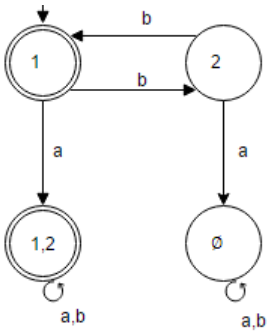

Figure 5: 1.16 part a

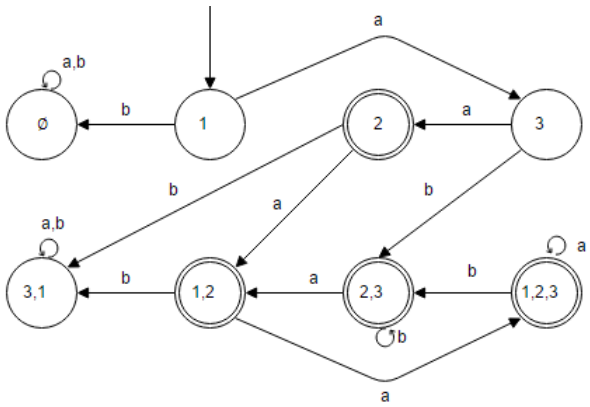

Figure 6: 1.16 part b

3 Regular Expression to NFA

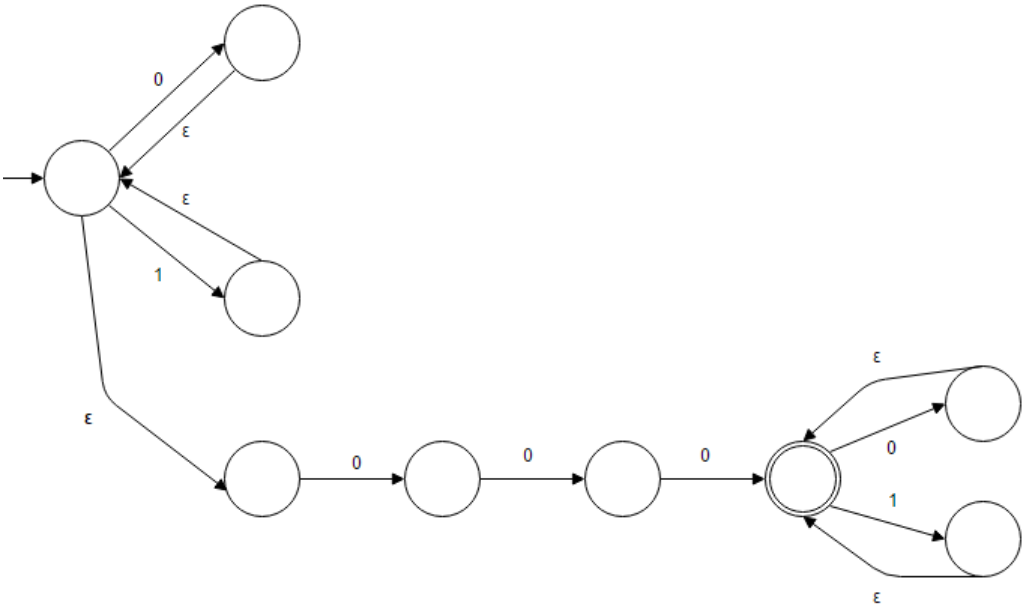

Figure 7: (0 U 1)∗ 000 (0 U 1)∗

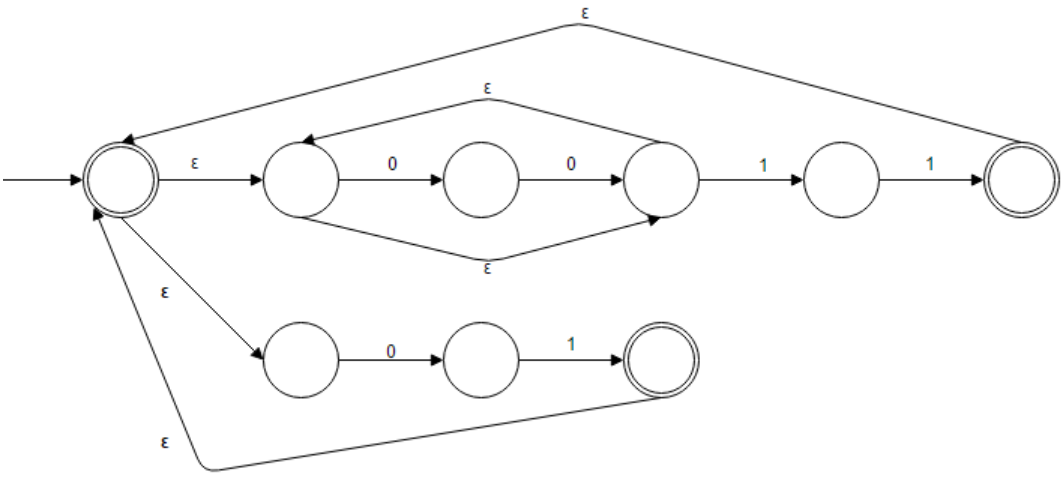

Figure 8: (((00)∗(11)) U 01)∗

4 Finite Automata to Regular Expression

5 Pumping Lemma

5.1 A = $\{a^{n3} | n \geq 0\}$

5.2 B = $\{0^n 1^m 0^n | m,n \geq 0\}$