

# CS338 HW1

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## 1 State Diagrams of DFA

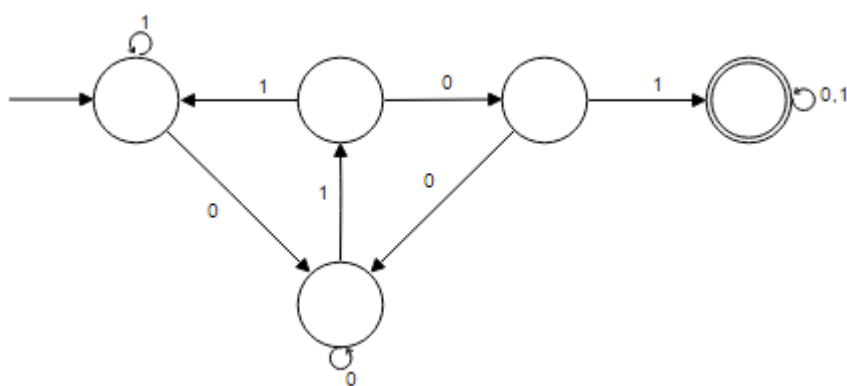


Figure 1:  $\{w \mid w \text{ contains the substring } 0101 \text{ (i.e., } w = x0101y \text{ for some } x \text{ and } y)\}$

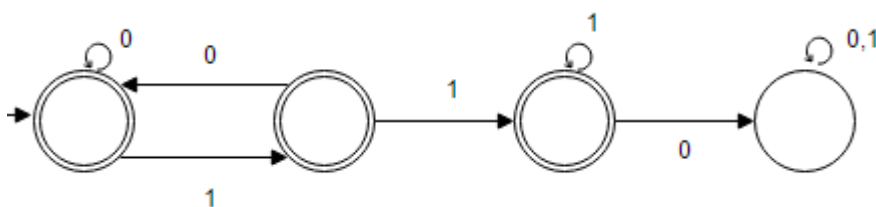


Figure 2:  $\{w \mid w \text{ doesn't contain the substring } 110\}$

## 2 State Diagrams of NFA

## 3 NFA to DFA

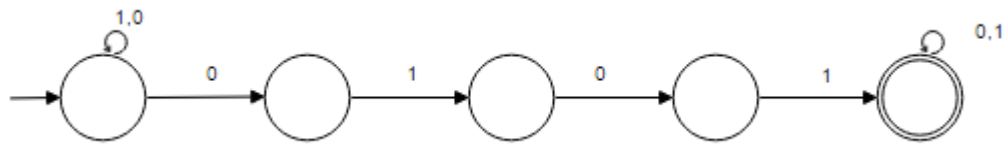


Figure 3:  $\{w \mid w \text{ contains the substring } 0101 \text{ (i.e., } w = x0101y \text{ for some } x \text{ and } y)\}$

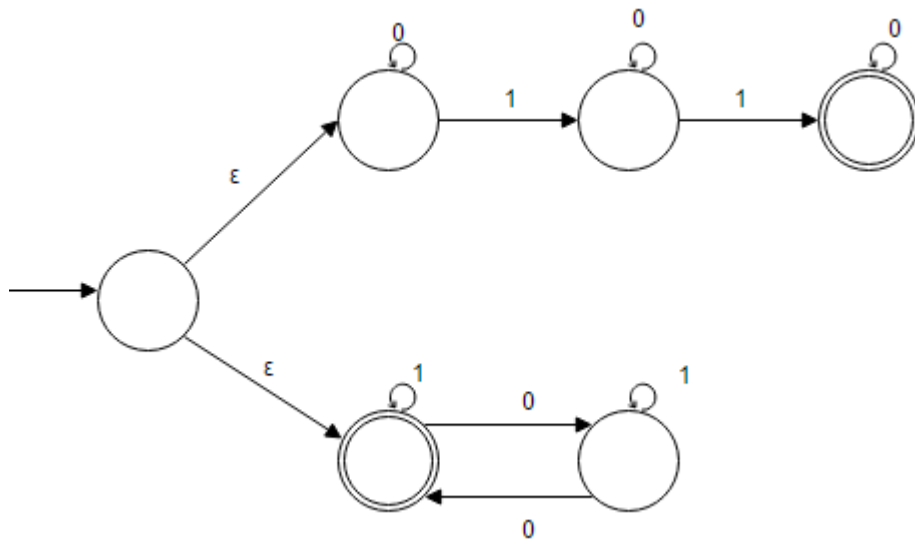


Figure 4:  $\{w \mid w \text{ has either an even amount of } 0\text{'s or exactly } 2 \text{ } 1\text{'s}\}$

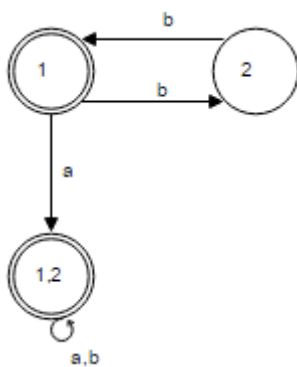


Figure 5: 1.16 part a

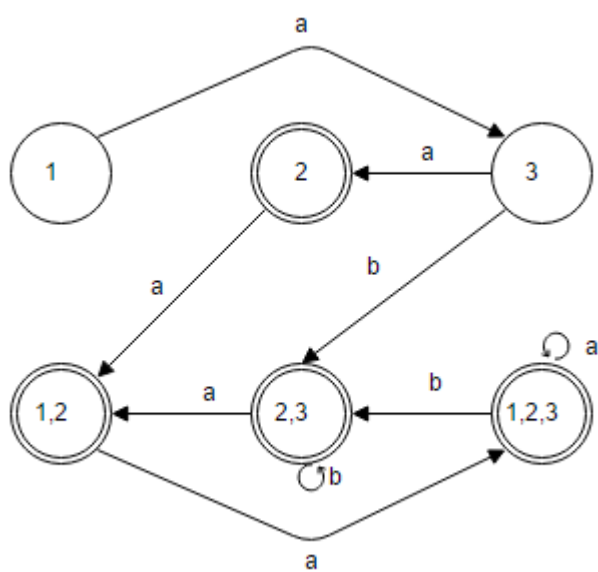


Figure 6: 1.16 part b