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**1: Design a NFA**

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Construct a NFA that recognizes the following language, assuming alphabet  $\{0, 1\}$

(a)  $L_1 = \{01\}$

(b) How would modify your NFA from a) to get an NFA for  $L_2 = L_1^* = (01)^*$ .

Draw the NFA for  $L_2$

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**2: Concatenation of Languages**

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Consider the following 2 languages  $L_4 = \{1, 00, 01\}$ ,  $L_5 = \{11, 01\}$ .

Write in set notation  $L_4 \circ L_5$

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**3: Closure Properties**

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Give a DFA for the following languages. For each of the following languages their DFA can be constructed by combining DFAs for simpler languages.

(a)  $L_1 = \{w \mid w \text{ has an even amount of } 0's \text{ or does not contain substring } 11\}$

(b)  $L_2 = \{w \mid w \text{ has an even amount of } 0's \text{ and contains substring } 11\}$

(c)  $L_3 = \{w \mid w \text{ has an even amount of } 0's \text{ but does not contain substring } 11\}$

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