

Automata and Formal Languages

Homework Set 3

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Problem 1

Give NFAs with the specified number of states recognizing each of the following languages. In all cases the alphabet is $\{0, 1\}$.

1. The language $\{\epsilon\}$ with one state.
2. The language 0^* with one state.
3. The language $0^*1^*0^*$ with three states.

Problem 2

Give state diagrams of DFAs recognizing the following languages. In all cases the alphabet is $\{0, 1\}$.

1. $\{w \mid w \text{ contains the substring } 0101, \text{ i.e., } w = x0101y \text{ for some } x \text{ and } y\}$.
2. $\{w \mid \text{every even position of } w \text{ is a } 1\}$.

Problem 3

Give NFAs with the specified number of states recognizing each of the following languages. In all cases the alphabet is $\{0, 1\}$.

1. The language $\{w \mid w \text{ ends with } 00\}$ with three states.
2. The language $\{0\}$ with two states.

Problem 4

Do Exercise 1.12 (b) in the textbook.