

# Automata and Formal Languages

Homework Set 3

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Due date: Oct. 8

## Problem 1

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 2

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 3

Do Exercise 1.10 in the textbook.