

# CS 3530: Assignment 1a

Fall 2015

## Exercises

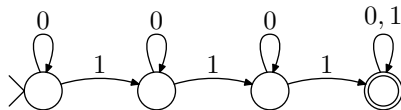
### Exercise 1.6bcefm (20 points)

#### Problem

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

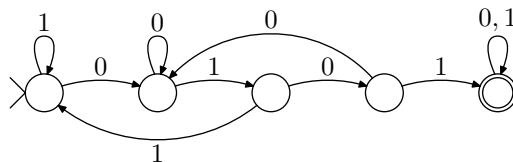
- b. Language:  $\{w : w \text{ contains at least three 1s}\}$

**Solution**



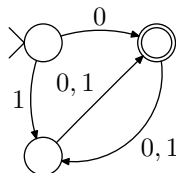
- c. Language:  $\{w : w \text{ contains the substring } 0101, \text{ i.e., } w = x0101y \text{ for some } x \text{ and } y\}$

**Solution**



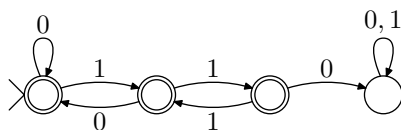
- e. Language:  $\{w : w \text{ starts with } 0 \text{ and has odd length, or starts with } 1 \text{ and has even length}\}$

**Solution**



- f. Language:  $\{w : w \text{ doesn't contain the substring } 110\}$

**Solution**



- m. Language: The empty set

**Solution**

