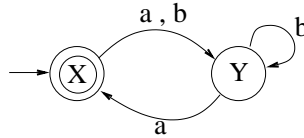




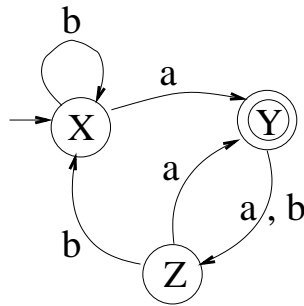
RW324 Tut 3

1. Sipser Exercise 1.17 (b)
2. Sipser Exercise 1.17 (c)
3. Show that $\{x \in \{a, b, c\}^* | x \text{ is a palindrome}\}$ is not regular.
4. Show that the set PAREN of balanced strings of parentheses over the alphabet $\{ (,) \}$ is not regular. For example $(() () ())$ is in PAREN but $) (()$ not.
5. For each of the automata below, write down the corresponding set of language equations, solve them, and so find a regular expression equivalent to the given automaton.

(a)



(b)



6. Draw the automaton corresponding to the language equations below. Assume that X corresponds to the initial state. Also find a regular expression for X .

$$X = bY + aZ, Y = bY + aX + \varepsilon, Z = aZ + bX$$

7. Exercise 2.4 (a)-(g) in Sipser.