Homework #2

## Due on 23:59, September 30, 2024

Problem 1. (40pts)

Exercise 1.7 Give state diagrams of NFAs with the specified number of states recognizing each of the following languages. The alphabet is $\{0, 1\}$.
(Hint: You can refer to P68-P69 in the textbook or Regular expressions (part 2) for a better understanding of converting a regular expression to NFA.)

(a) The language $\{w | w$ ends with $00\}$ with three states
(e) The language $0^*1^*0^+$ with three states

Problem 2 (30pts)

Exercise 1.21 (b) Use the procedure described in Lemma 1.60 to convert the following finite automata to regular expression.
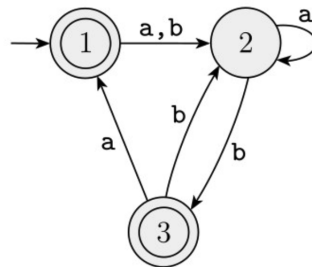
(b)

Problem 3 (30pts)

Exercise 1.46 (a) Prove that the following language is not regular. You may use the pumping lemma and the closure of the class of regular languages under union, intersection, and complement.
(Hint: Pumping lemma. Please take a look at the three conditions of Theorem 1.70 in the slide.)

(a) $\{0^n1^m0^n | m, n \geq 0\}$