Homework 3: Regular Expressions and Minimization
Theory of Computation (CSCI 3500)

Soft Deadline: Wednesday, March 23 by 11:59pm
Hard Deadline: Friday, March 25 by 11:59pm

Write the solution to each question on its own page.
All questions must be in order.
Your name must be on each page.
Then email me a single PDF file of your solution set.
All assignments not adhering to this will not be graded.

0. Using the minimization algorithm for DFAs, convert the following DFA into its equivalent minimal DFA. You must supply the distinction table, the formal definition, and the diagram.
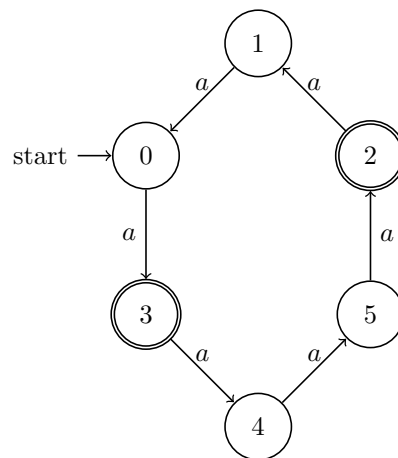
   What language do these automata accept?

1. Define a regular expression for the language:

$$L = \{w \in \{0,1\}^* \mid w \text{ has a subword } 101\}$$

2. Prove that the following language is non-regular using the pumping lemma:

$$L = \{w_1 \# w_2 \mid w_1, w_2 \in \{0, 1\}^* \text{ and } |w_1|_0 = |w_2|_1 + 3\}$$