CSCI 2400 – Models of Computation

Homework 1

**Problem 1.** Construct DFAs that accept the following languages defined over the alphabet \( \{0, 1\} \):

1. \( L = \{ \text{all strings with exactly two 0s} \} \)
2. \( L = \{ \text{all strings with exactly two 0's and more than one 1} \} \)
3. \( L = \{ w : |w| \mod 5 = 1 \} \)

**Problem 2.** Use DFAs to show the following:

1. The language \( L = \{ a^n : n \geq 4 \} \) is regular.
2. If \( L \) is regular then \( L \cup \{ \lambda \} \) is regular.
3. If \( L \) is regular then \( \overline{L} \) is regular.