Automata Theory - Quiz I (Solutions)

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1 Problems

1. Design a DFA to accept the language $L$, where
$L = \{w | w \in \{0, 1\}^*, \text{ w is divisible by 3, when interpreted as a binary number} \}$, (3 points)

Solution: □

![DFA Diagram](image1)

Figure 1: DFA

2. Convert the NFA in Figure (2) to a DFA, (3 points)

![NFA Diagram](image2)

Figure 2: NFA
3. Convert the regular expression $01^*+(0+1)^*$ into an $\epsilon$-NFA. (3 points)

Solution: □

4. Let $\Sigma = \{0, 1, 2\}$ be an alphabet. Write a regular expression to accept all strings over $\Sigma^*$, such that the third symbol from the right is 1 or 2, but not 0. (1 point)

Solution:

$$(0+1+2)^*(1+2)(0+1+2)(0+1+2)$$