

Theoretical Computer Science 1 Homework

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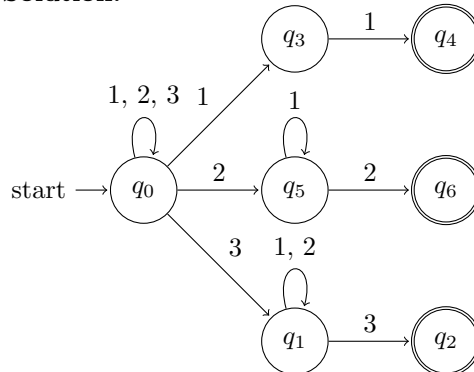
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Week #2 Exercises

Exercise 1.

Give a diagram of nondeterministic finite automata that accepts strings in $1, 2, 3^*$ such that last number appears at least two times and there are no larger number between the last two occurrences of the last symbol. For instance, 1231211, 1231212 and 32132123 are three strings accepted by the NFA.

Solution:

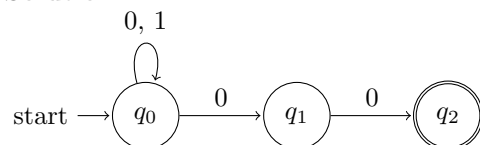


Exercise 2

Give state diagrams of NFAs with the specified number of states recognizing each of the following languages. In all parts the alphabet is $\{0, 1\}$.

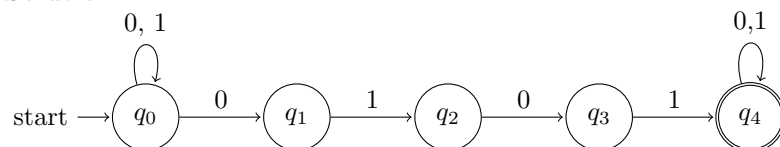
1. $\{w \mid w \text{ ends with } 00\}$ with three states.

Solution:



2. $\{w \mid w \text{ contains the substring } 0101\}$ with five states.

Solution:



3. $\{w \mid w \text{ contains an even number of 0s, or contains exactly two 1s}\}$ with six states.

Solution:

