

CSC240 Winter 2021 Homework Assignment 9

due Tuesday March 30, 2021

1. Construct a deterministic finite automaton that accepts the language consisting of every string in $\{0,1\}^+$ that does not contain the substring 011. For example, 0101 should be accepted by your finite automaton, but λ and 0110 should be rejected.
 - Express your finite automaton as a 5 tuple.
 - Draw your finite automaton.
2. For each state q in your finite automaton, give a regular expression r_q that describes the set of strings in $\{0,1\}^*$ that take your finite automaton from its initial state to q . Remember that the only symbols you can use in your regular expressions are 0, 1, (,), ·, +, and *.
3. Give a careful proof using induction that your answers for questions 1 and 2 are correct.

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