

CSE331: Automata and Computability

Worksheet 2 (NFA and DFA)

**utilize the NFA property of multiple states for 1 input/ ϵ transitions as much as possible.

Question 1: Design NFA/ ϵ -NFA accepting the following languages over the alphabet $\{0, 1\}$:

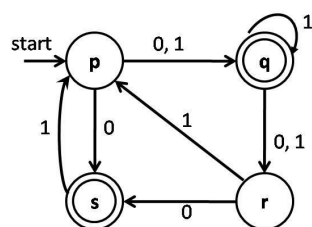
- The set of all strings ending in 00.
- The set of all strings with three consecutive 0's
- The set of strings with 011 as a substring.
- The set of all strings such that each block of five consecutive 1's is followed by at least two 0's
- All strings containing exactly 4 0s or an even number of 1s
- $L = \{w \mid w \text{ has even number of 0's and contains exactly two 1's}\}$ with ~~six states~~.
- All Strings that do not contain substring 0100.

Question 2:

- Design an NFA/ ϵ -NFA that has 010 as substrings over the alphabet $\{0,1\}$ and also depict the transition table.
- Convert the NFA/ ϵ -NFA to DFA using subset construction. Show the resulting transition diagram.

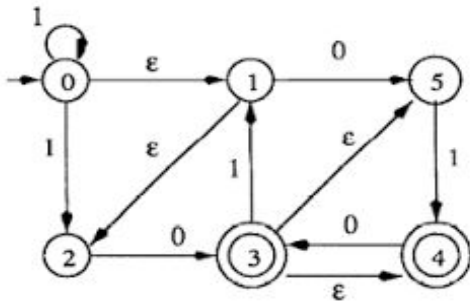
Question 3:

Consider the following NFA.



- Convert this NFA to an equivalent DFA by subset construction.
- Describe the language it accepts.

Question 4: Convert the following ϵ -NFA to DFA over the alphabet $\{0,1\}$



Question 5: Describe the language the following NFA accepts over the alphabet $\{a,b,c,d\}$.

