DMath Problem Set

06 February 2021 15:06

2. $rev(L) = \{ u \in A^* \mid u = rev(v) \text{ for some word } v \in L \}$

$A = \{a, b, c, d\}$

$A^* = \{a, b, c, d\}^*$

Input L regular language over A^*.

A — finite alphabet,

Construct an automata (NFA / DFA) which accepts $rev(L)$.

L is regular then rev(L) is also regular.

that means we can construct a finite State Automata.

$M = (Q, \Sigma, \delta, q_0, F)$

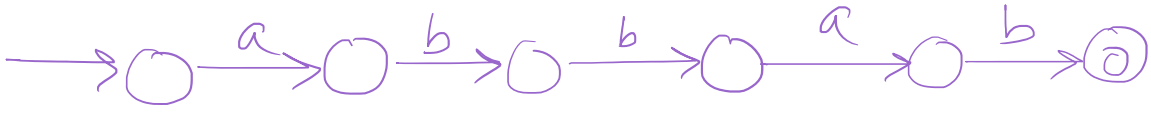
five tuple notation → DFA

$M' = L(M') = rev(L)$

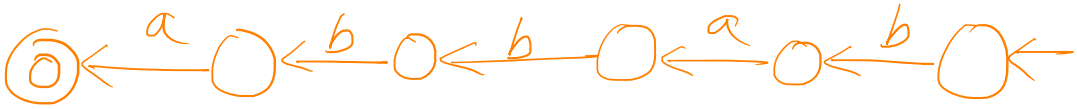
$\hookrightarrow (Q', \Sigma, \delta', q_0', F')$

this is the idea.

$L = \{abbab\}$.



reverse

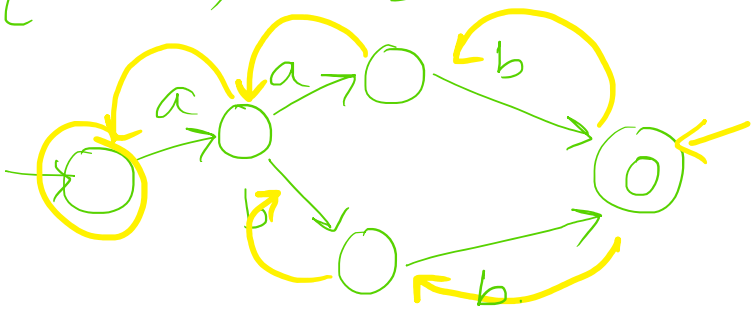


this is the idea.

$M = (Q, \Sigma, \delta, q_0, F)$

$M' = (Q', \Sigma, \delta', q_0', F')$

$L = \{aaab, abbb\}$.



$M' = (Q' = Q, \Sigma, \delta', F, q_0)$

$V \in rev(L)$

$\exists u \in L \quad rev(u) = v$

$(u, a, v) \in \delta' \quad$ iff $\quad (v, a, u) \in \delta$

$\delta \subseteq Q \times A \times Q.$

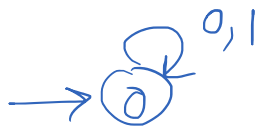
$Prefix(u) = \{ v \in A^* \mid \exists w \in A^*, vw = u \}$

abaaab.

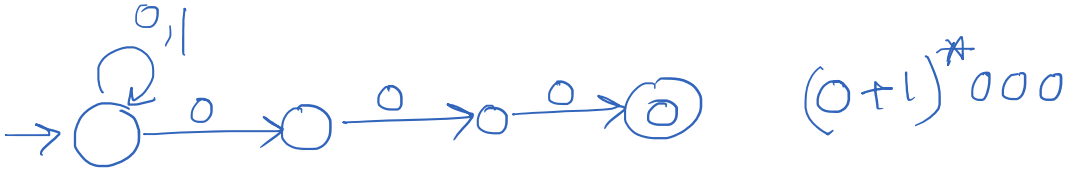
$\{\epsilon, a, ab, aba, abaa, abaaa, ab\,aaab\}$

$Prefix(u) = \{ v \in A^* \mid \exists u \in L, v \in pref(u) \}$.

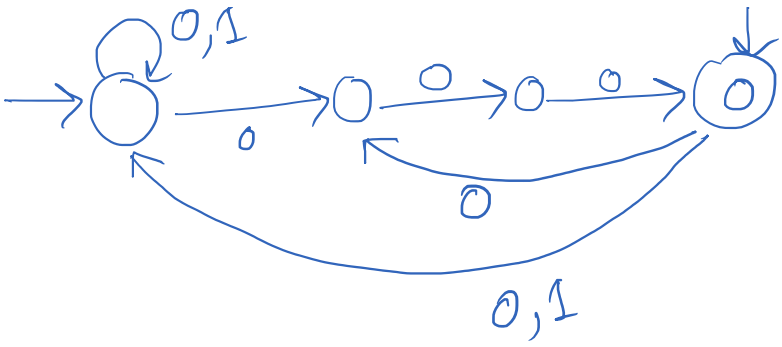
3.b $((0+1)^*000)^*$

$(0+1)^*$ 

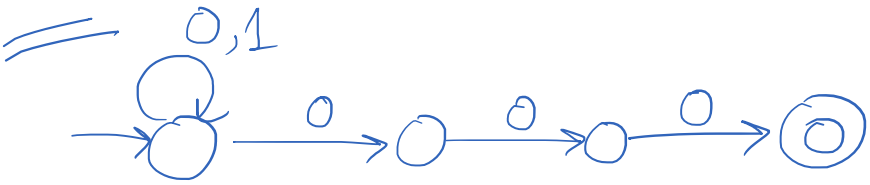
(000) 



$(0+1)^*000$



or.

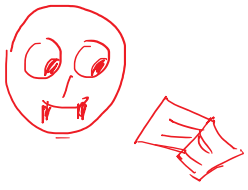


$\{(0+1)^* 000 (0+1)^* 000\}$

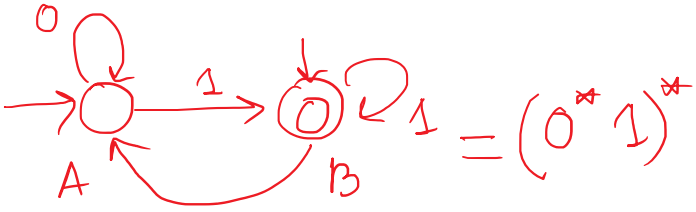
$(0+1)^*$

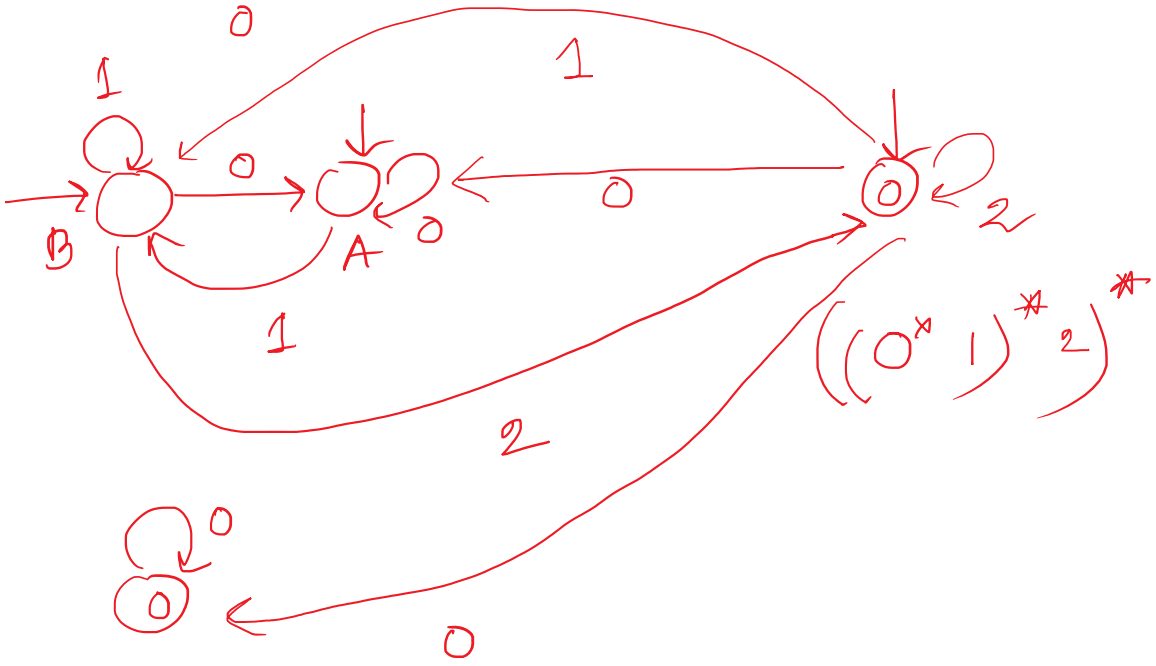
$(0+1)^* 000$

this is cool solution :-



(v) $((0^*1)^*2)^* 0^*$ general technique





42. 6 & 7 Immediately and eventually

Q $L_3 = \{ w \in \{0,1\} \mid \#\ 0s\ in\ w\ is\ divisible\ by\ 3 \}$.

$L_6 = \{ w \in \{0,1\} \mid \#0^*\ in\ w\ is\ divisible\ by\ 6 \}$

Complementation for NFA :-

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Why the DFA technique on NFA doesn't work?