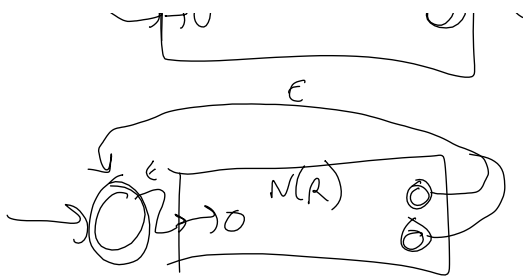
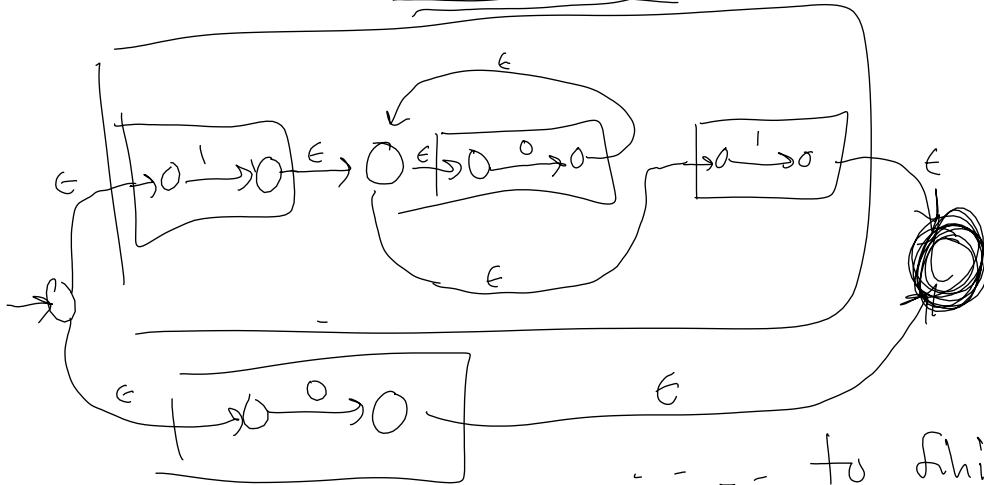


Kleene R^*



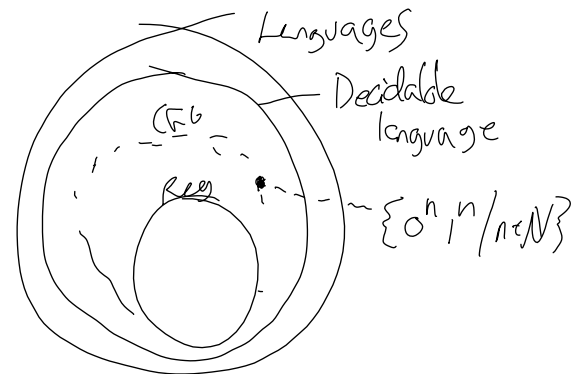
$(0 + 10^*1)^*$

$10^*1 + 0$



... to finish do R^*

Context :



"I can solve the problem with NFA's"

"I need to produce a Reg Exp that does X"

NFA to DFA subset construction

Given $N = (Q, \Sigma, \delta, s, A)$

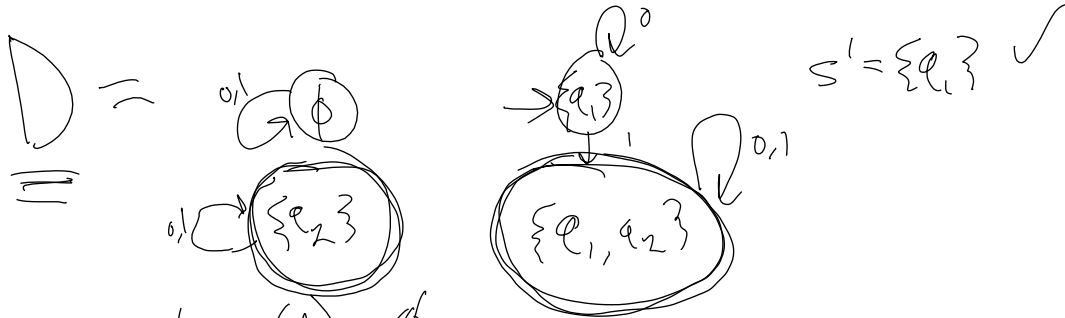
Then to construct $N' = (Q', \Sigma, \delta', s', A')$

have no transitions (0, 1, ...)

Idea: $Q' = P(Q)$



$Q' = P(\{q_1, q_2\}) = 2^Q = \{\emptyset, \{q_1\}, \{q_2\}, \{q_1, q_2\}\}$



$A' = P(A) - \emptyset$

$\delta: Q \times \Sigma \rightarrow P(Q)$

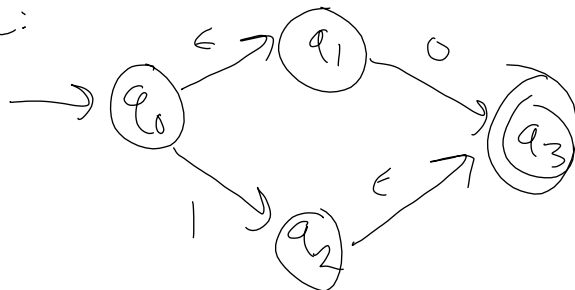
$\delta': Q' \times \Sigma \rightarrow Q'$

$P(Q) \times \Sigma \rightarrow P(Q)$

$A' = P(A) - \{\emptyset\} = \{S \in P(Q) \mid \exists q \in S, q \in A\}$

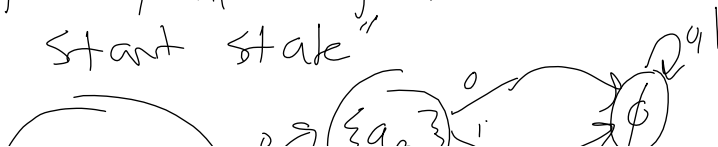
Incremental Construction

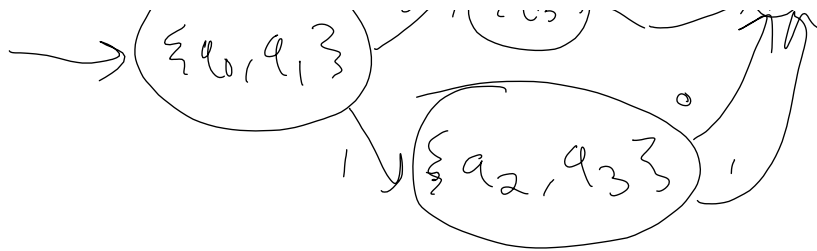
Example:



$\delta(q_3, 0) = \emptyset$
 $\delta(q_3, 1) = \emptyset$

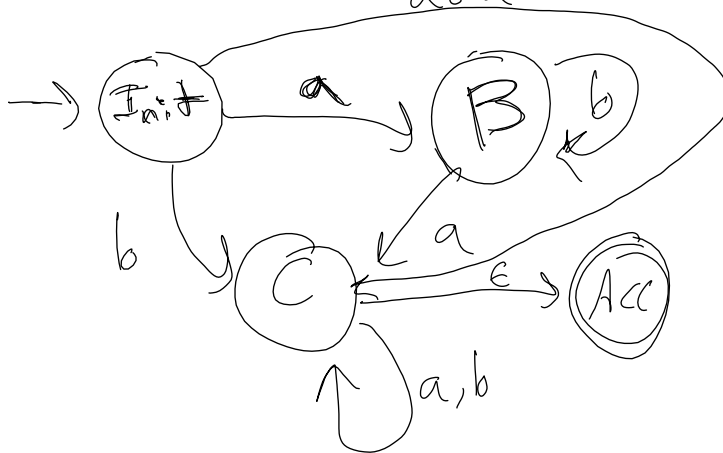
"Build up only introducing states reachable from start state"





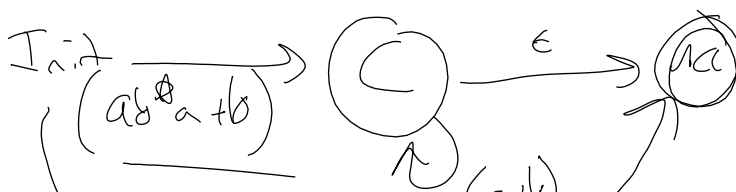
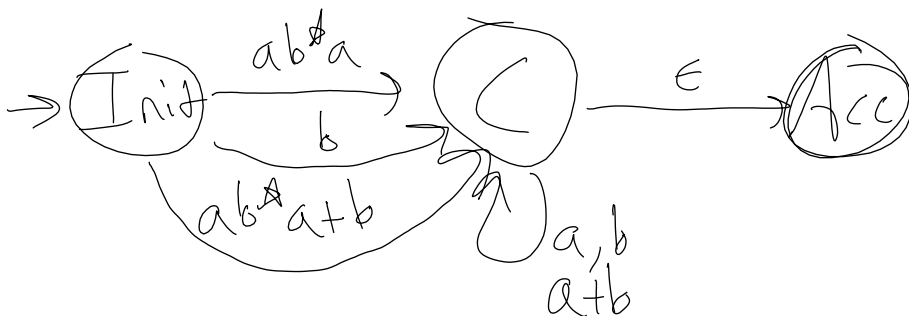
Pay off: ^{Thm:} If L is a regular lang,
 then Suffix(L) is also regular.

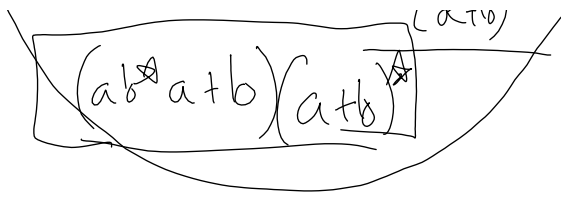
DFA to regular expression
 via NFAs Han and Wood
 ab^*a



- Remove 1 state at a time

→ transitions can be strings or Regexp's
 not just symbols.





$I_{2,2}$

ACC

