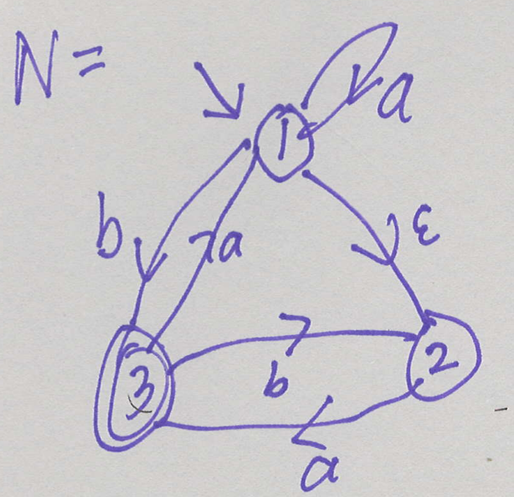
CSE 491/596 Wed Sep 15 ($r=q$ allowed)

$N =$



Define $\underline{\delta}(p,c) = \{r :$ N can process c from p to a state q and then reach r from q by 0 or more trailing ε-arcs$\}$.

$\underline{\delta}(1,a) = \{1,2\}$ $\quad \underline{\delta}(1,b) = \{3\}$

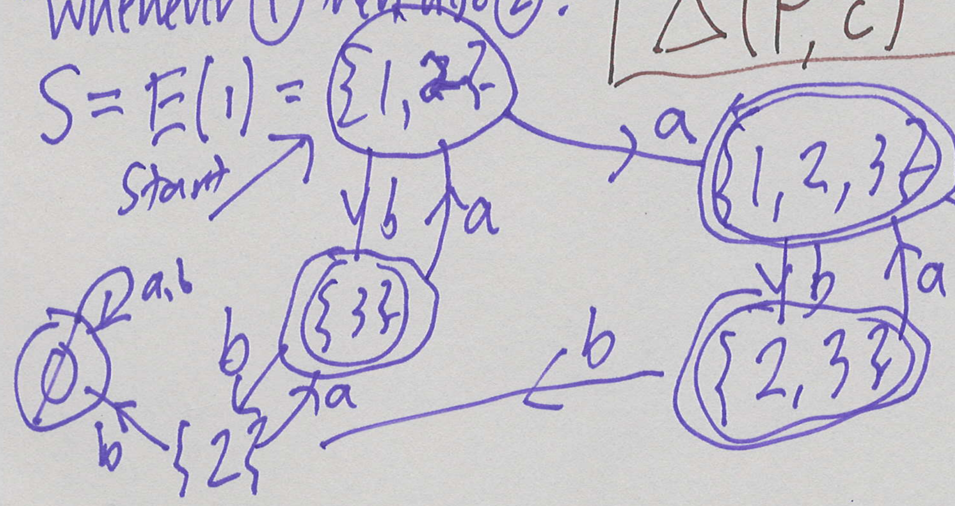
$\underline{\delta}(2,a) = \{3\}$ $\quad \underline{\delta}(2,b) = \emptyset$

$\underline{\delta}(3,a) = \{1,2\}$ $\quad \underline{\delta}(3,b) = \{2\}$.

"Whenever 1 then also 2."

$$\boxed{\Delta(P,c) = \bigcup_{p \in P} \underline{\delta}(p,c)}$$

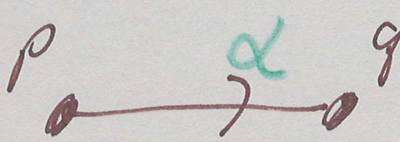
$S = E(1) = \{1,2\}$



$\Delta(\{1,2\},b) = \underline{\delta}(1,b) \cup \underline{\delta}(2,b)$
$= \{3\} \cup \emptyset = \{3\}$.

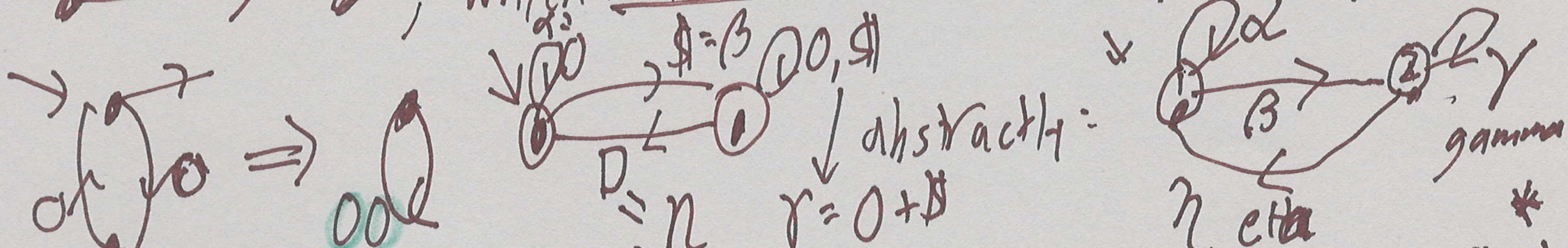
The numbers in the DFA set states tell all the possible ways N can process a string that goes to that state.

A generalized NFA (GNFA) is a 5-tuple $G = (Q, \Sigma, \delta, s, F)$ where now $\delta \subseteq Q \times \underline{Regexp(\Sigma)} \times Q$.



, which includes

as base cases.



$L_{11} = \{$strings processed from 1 to 1$\}$

$L_{11}(\text{one lap}) = \alpha + (\beta . \gamma^*) . \eta$

$L_{11} = L_{11}(\text{one lap})^* = (\alpha + \beta\gamma^*\eta)^*$