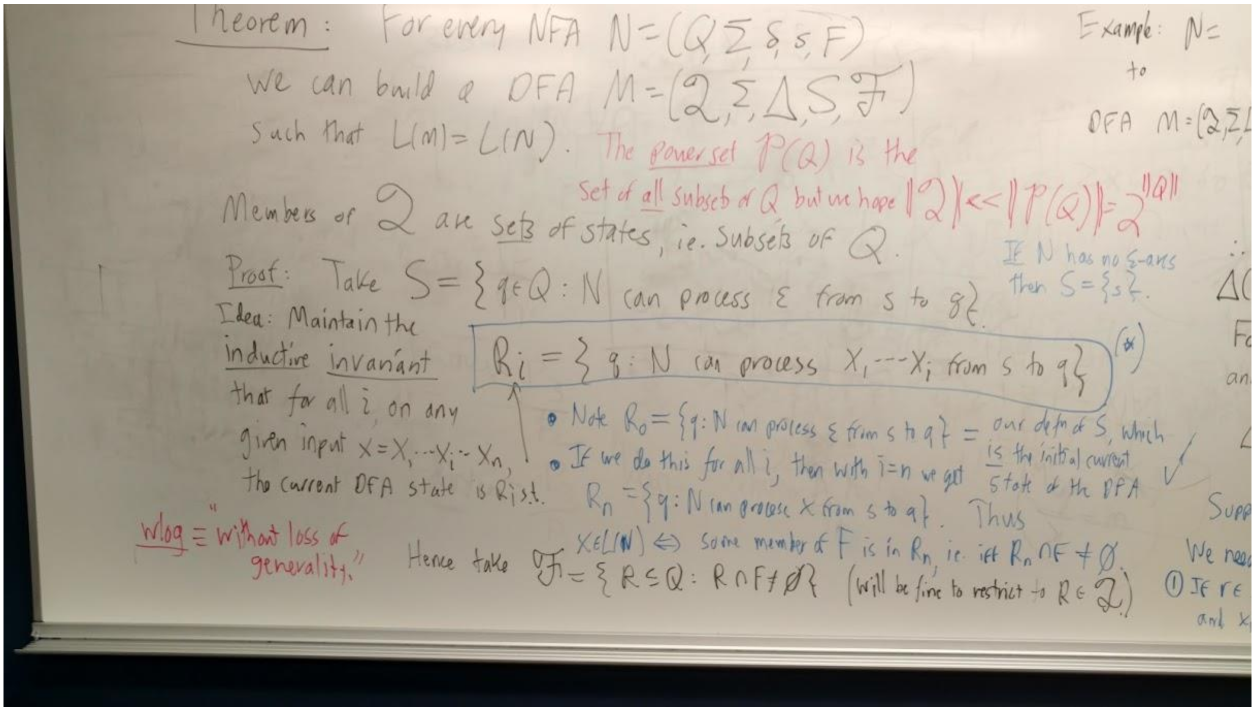
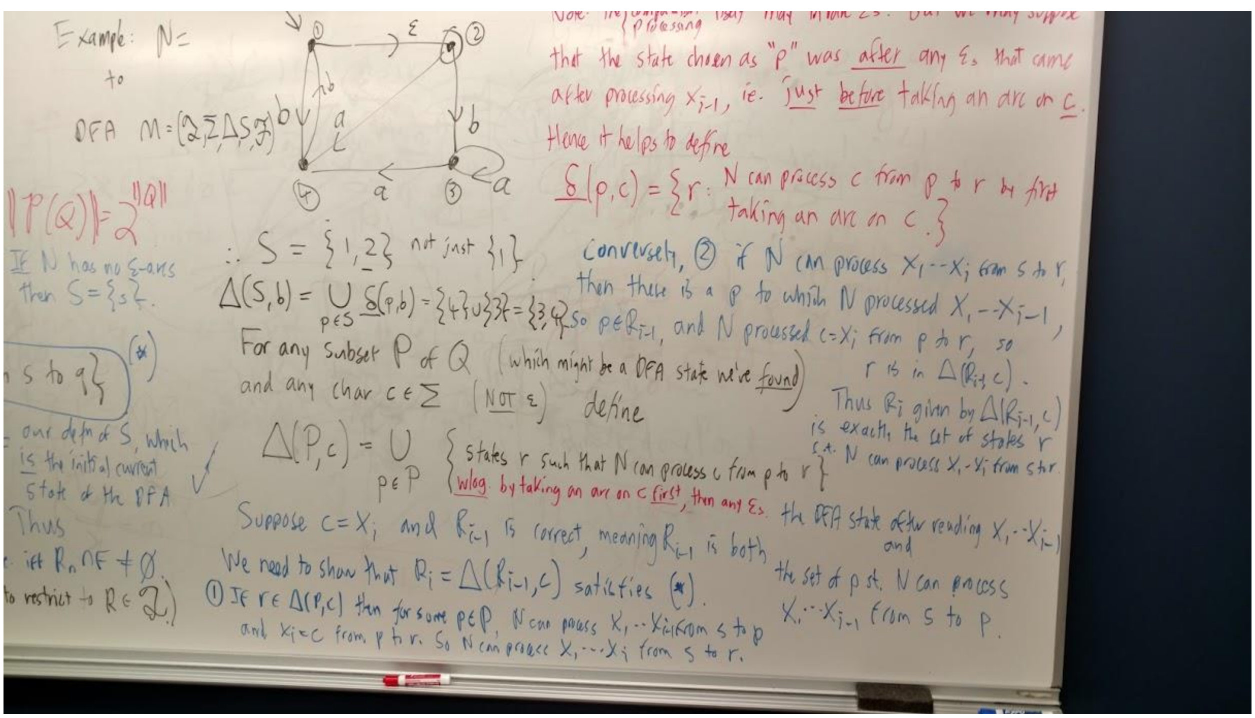
CSE596 Lecture Friday Sept. 6, 2019

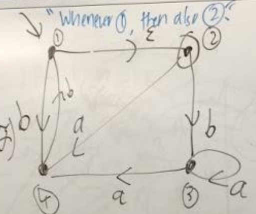




Example: N =

to

DFA $M = (Q, \Sigma, \Delta, S, \mathcal{F})$



$\|Q\| \ll \|\mathcal{P}(Q)\| = 2^{\|Q\|}$

IF N has no ε-arcs then $S = \{s\}$.

$q\}$.

$\{\ldots\ i$ from s to $q\}$ (*)

$q\}$ = our defn of S, which is the initial current state of the DFA

we get $q\}$. Thus

R_n, i.e. iff $R_n \cap F \neq \emptyset$.

(be fine to restrict to $R \in Q$.)

$\therefore S = \{1, 2\}$ not just $\{1\}$.

δ	a	b
1	$\emptyset$	$\{4\}$
2	$\{4\}$	$\{3\}$
3	$\{3,4\}$	$\emptyset$
4	$\emptyset$	$\{1,2\}$

Build the DFA economically by breadth-first search.

$\mathcal{F}$ = {states that include 2}.

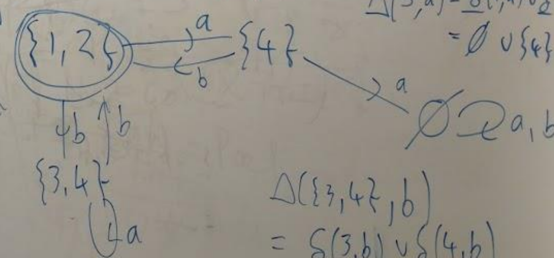
Note: The computation (processing) itself may involve ε's. But we may suppose that the state chosen as "p" was after any εs that came after processing x_{i-1}, i.e. just before taking an arc on c.

Hence it helps to define

$\underline{\delta}(p, c) = \{r :$ N can process c from p to r by first taking an arc on c.$\}$

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

$\Delta(S, a) = \underline{\delta}(1, a) \cup \underline{\delta}(2, a)$
$= \emptyset \cup \{4\} = \{4\}$



$\Delta(\{3,4\}, b)$
$= \underline{\delta}(3, b) \cup \underline{\delta}(4, b)$
$= \emptyset \cup \{1,2\} = \{1,2\}$.

No more new states.

$\therefore$ done with BFS and M.