

9/12(화) 제15강 $\delta^*(\delta)$ 의 재귀, Regular languages class의 M_0 , NFA \rightarrow DFA (Subset Construction)

DFA $A = (Q, \Sigma, \delta, q_0, F)$
 state terminal symbol
 Voc. Σ Voc.

$\delta: Q \times \Sigma \rightarrow Q$ $q_0 \in Q, F \subseteq Q$



	0	1
q_0	q_0	q_1
q_1	q_1	q_2
q_2	q_2	q_2

Substring 0.1
 $(0+1)^* 0 1 (0+1)^*$

\hookrightarrow regular expressions.

2.2.4 Extend the 2nd domain of δ from Σ to Σ^* . 감지성 (정확성)

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

Def (Ext.) ① iterative (반복적)

~~δ~~
 $\hat{\delta}: Q \times \Sigma^* \rightarrow Q$

$x = a_1 a_2 \dots a_n \in \Sigma^*$
 $1 \leq i \leq n: a_i \in \Sigma$

$0 \leq i \leq n: \delta(q_i, a_i) = q_{i+1} \in Q$



$\hat{\delta}(q_0, a_1 a_2 \dots a_n) = q_n$

Ext ② Recursive

$\hat{\delta}(q, \epsilon) = q \quad \forall q \in Q$

$\hat{\delta}(q, \underline{xa}) = \delta(\hat{\delta}(q, x), a) \quad \forall q \in Q, x \in \Sigma^*, a \in \Sigma$

$\hat{\delta}(q_0, a_1 a_2 \dots a_n)$

$= \delta(\hat{\delta}(q_0, a_1 \dots a_{n-1}), a_n)$ 1st rec

$= \delta(\delta(\hat{\delta}(q_0, a_1 \dots a_{n-2}), a_{n-1}), a_n)$ 2nd rec

$= \delta(\delta(\delta(\hat{\delta}(q_0, a_1 \dots a_{n-3}), a_{n-2}), a_{n-1}), a_n)$ 3rd rec

\dots
 $= \delta(\delta(\dots \delta(\delta(\hat{\delta}(q_0, a_1), a_2, a_3) \dots a_{n-1}), a_n))$ (n-1)th rec

$= \delta(\delta(\dots \delta(\delta(\delta(\hat{\delta}(q_0, \epsilon), a_1), a_2, a_3) \dots a_{n-1}), a_n))$ nth rec

$= \delta(\delta(\dots \delta(\delta(\delta(q_0, a_1), a_2, a_3) \dots a_{n-1}), a_n))$ 1st base

Σ^* ... 길이가 0 이거나 모든 string

Σ^+ ... 길이가 1 이상 모든 string

$\Sigma^+ \subseteq \Sigma^*, \Sigma^* = \Sigma^+ \cup \{\epsilon\}$

$\Sigma^* = \bigcup_{i \in \mathbb{N}_0} \Sigma^i$

$\Sigma^+ = \bigcup_{i \in \mathbb{N}_1} \Sigma^i$

where $\mathbb{N}_0 = \{0, 1, 2, \dots\}$

$\mathbb{N}_1 = \{1, 2, \dots\}$

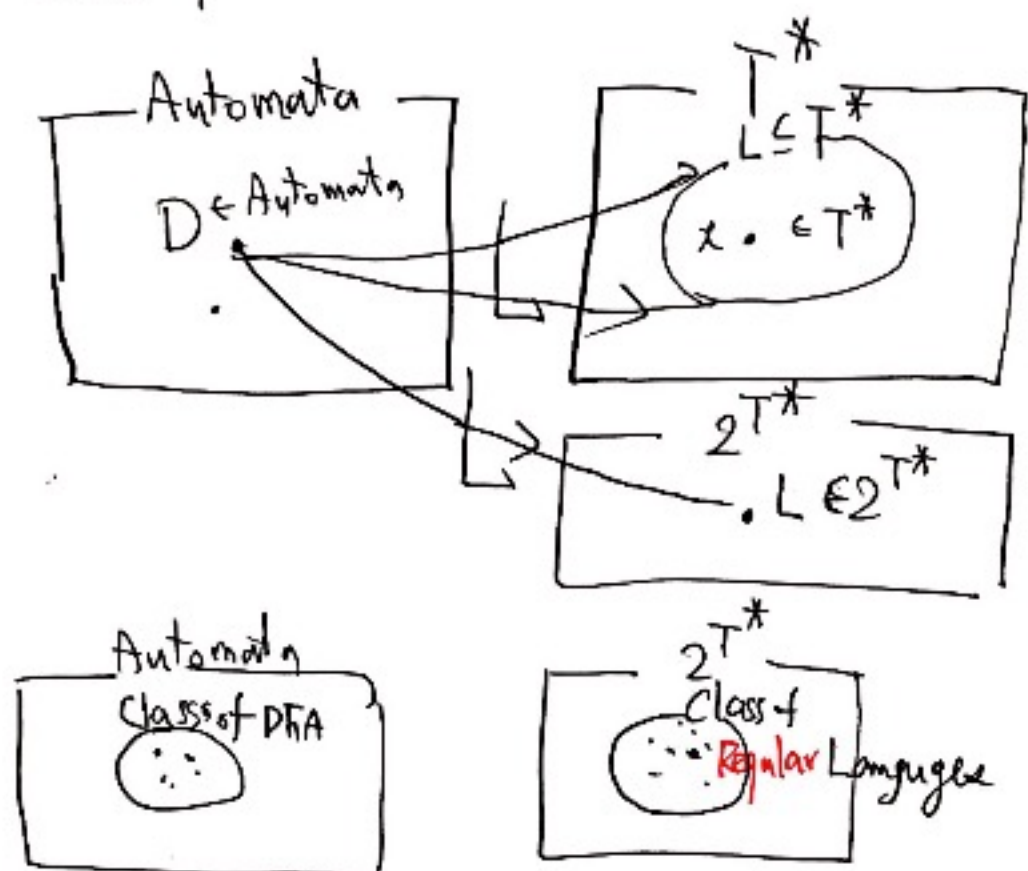
2.2.3 The Language of DFA

Let $D = (Q, T, \delta, q_0, F)$ be a DFA. Then

We define a language defined by D , as $L(D)$ as follows,
(accepted) ^{a DFA}

$$L(D) = \{x \in T^* \mid \delta(q_0, x) \in F\}$$

$$L(D) \subseteq T^*$$



P19... partial function - 이기 볼 것. - 김재성(준) 다음에는 강의 시작점이

2.3 Nondeterministic Finite State Automata

$$(NFA) N = (Q, T, \delta, q_0, F)$$

(1) Q , (2) T , (4) q_0 , (5) F 는 DFA와 같음

$$(3) \delta : Q \times T \rightarrow 2^Q$$

