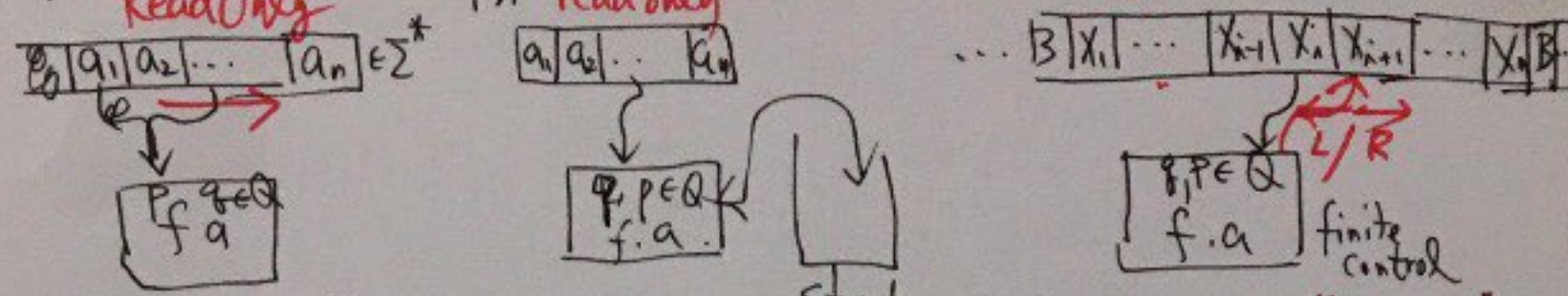


chap 2, 3, 4 11/29 (4/4) m/2277 Turing Machine. chap 8, 9, 10, X
 FA Read Only PDA read only ~~ΣUT (ΣΣΓ)~~



$$\delta: Q \times \Sigma \rightarrow Q \cup \{ \perp \}$$

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

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

$$(f, x) \in Q \times \Sigma^*$$

$$\delta: Q \times \Sigma^* \times P^* \rightarrow Q \times P^*$$

$$\delta(p, x, y) \rightarrow (q, y, pY)$$

$$\delta: Q \times P^* \rightarrow Q \cup \{ \perp \}$$

read/write tape

Left/Right Parser
LL(k)/LR(k) parser. (yacc)

Context-free grammar
 $A \rightarrow \alpha, A \in N, \alpha \in (NUT)^*$

(unrestricted) Grammar

$$\alpha \rightarrow \beta \in P$$

$$\alpha \in (NUT)^*$$

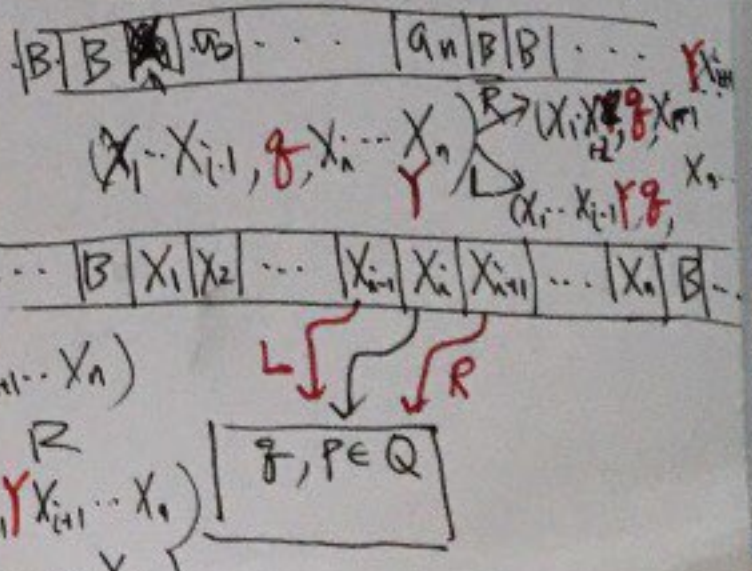
Regular Grammar
 $A \rightarrow xB \text{ or } \alpha \in P$
 $A, B \in N, x \in \Sigma^*$

8.1 Problems That Computer Cannot Solve (X skip)
Define (= program)

8.2 Turing Machine

$$TM M = (Q, T, P, \delta, q_0, B, F)$$

- i) Q .. a set of states (= state voc.)
- ii) T .. a set of input symbols (= input voc.)
- iii) P .. a set of tape symbols (= tape voc.) when $T \subseteq P$
 $a_1 a_2 \dots a_n \in T^* \in P^*$
- iv) $\delta: Q \times P \rightarrow Q \times P^* \times \{L, R\}$
- v) $q_0 \in Q$.. an initial state
- vi) $B \in P$.. a blank symbol (tape)
- vii) $F \subseteq Q$.. a set of final states



$$(p, Y, L) \in \delta(q, X_i): (q, X_{i-1}, X_i, X_{i+1}, \dots, X_n)$$

$$\text{or } (p, Y, R) \in \delta(q, X_i): (q, X_1, \dots, X_{i-1}, X_i, X_{i+1}, \dots, X_n)$$

$$L(M) = \{ \alpha \in T^* \mid (\epsilon, q_0, \alpha) \xrightarrow{*}_M (\alpha, f, \beta), \alpha, \beta \in P^*, f \in F \}$$

L is recursively enumerable, if $\exists TM M \lambda \in T^* (\epsilon P^* (\because T \subseteq P))$
 $\exists L = L(M)$.
 재귀적으로 열거 가능한 수 λ 에
 - type 2

Ex 8.2 $L = \{ 0^n 1^n \mid n \geq 0 \} \Rightarrow \{ X^n Y^n \mid n \geq 0 \}$

8.4 $0^m 10^n \rightarrow 0^{m-n}$ $m > n$ $m-n = m-n$ if $m > n$
 0 if $m \leq n$

8.6 $0^* 1^* \mid 10^*$ - type 3

$q_0: 0 \leq 1 \leq 0$

$q_1: 1$

8.3.2 Multiple Track \rightarrow 2bit \rightarrow nbit extension

-- read 339-341

8.3.3 Subroutine

Ex 8.8 $0^m 10^n \xrightarrow{*} (0^m 0^n)$
 read page 341
 1. 2. 3. 4. ... subroutine copy, driver
 Fig 8.1K Fig 8.1T