

G: 3/23 (木) Rewriting Systems, Chap 3 Regular Languages

Ex) $S \rightarrow \epsilon \mid 0S1 \dots$ R.S. (cfg) $(0+)^* = \{\epsilon, 0, 1, 00, 01, 10, 11, \dots\}$ $\mathcal{L} = \{0, 1\}^*$

$L(G) = \{0^n 1^n \mid n \geq 0\}$

$(0+)^* = \{\epsilon, 0, 1, 00, 01, 10, 11, \dots\}$ $\mathcal{L} \subset L((0+)^*)$

$(01)^* = \{\epsilon, 01, 0101, 010101, \dots\}$

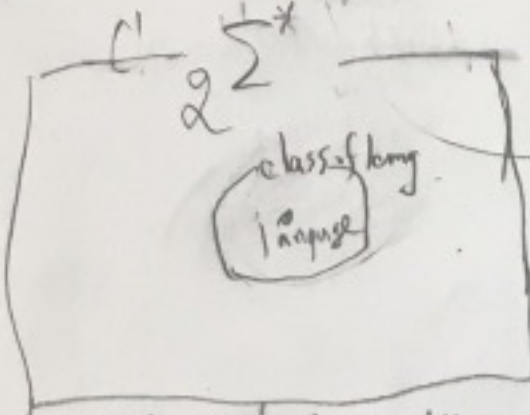
$(01)^* \neq \{0, 1\}^*$

Context-free language (type 2 ")
Chomsky's

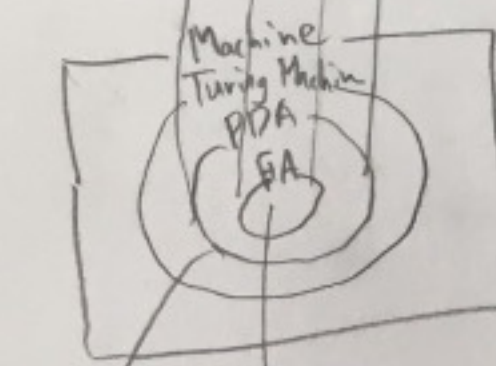
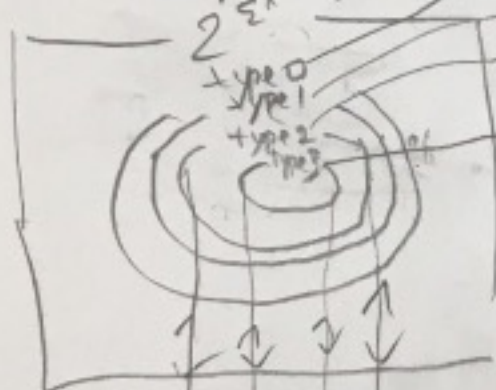
$= \{0^n 1^m \in \{0, 1\}^* \mid n, m \geq 0\}$

regular language - Chomsky's Language Hierarchy (type 3 ")

1965 R. Kuth, "On the Translation of the Languages from Left-to-Right"



Chomsky's Lang. Hierarchy

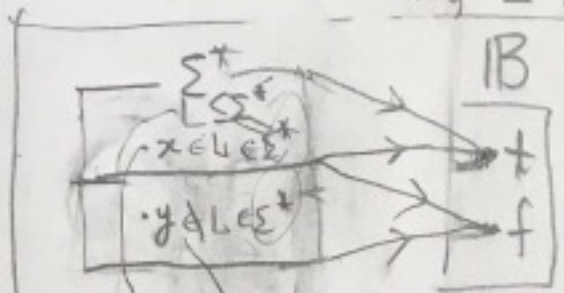


finite automata - type 3 RL
Push down Automata - type 2 CFL
Turing Machine - type 0 log

type 2 CFL? - Chomsky's

LR(L) parsing - Left-to-Right Scan with Rightmost Derivation using k-lookahead symbols

LL(L) parsing - Left-to-Right Scan with Leftmost Derivation



Given Σ and $L \subseteq \Sigma^*$ language

$\forall x \in \Sigma^* \rightarrow$ determine if $x \in L$ or $x \notin L$

$L: \Sigma^* \rightarrow \{t, f\} = B$

membership problem

language (over Σ)
Decision Problem
 $d: \mathbb{N} \rightarrow \{t, f\} = B$