CSC 220

10/20/2020

Grammar

$$L = \{ 0^n 1^n \mid n \in \mathbb{N} \}$$

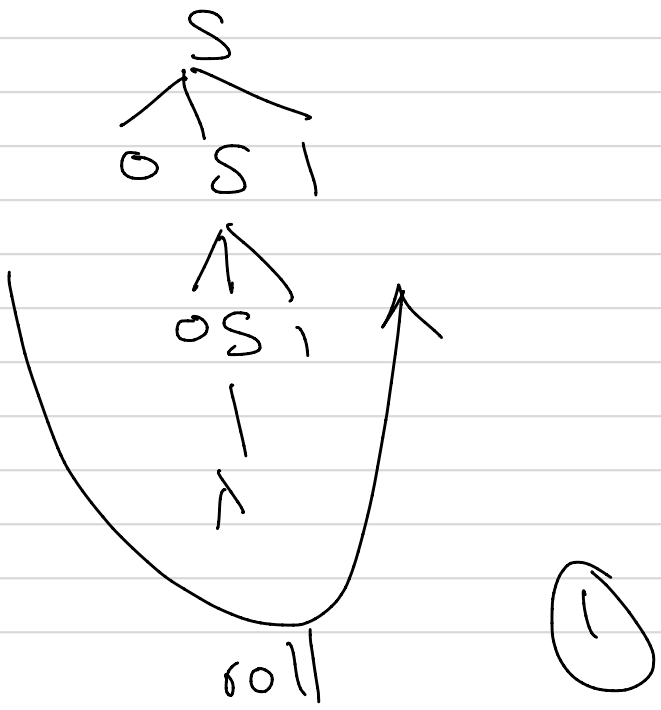
$n=0$ $\quad 0^0 1^0 = \lambda \cdot \lambda = \lambda$

$n=1$ $\quad 01$

$n=2$ $\quad 0011$

$n=3$ $\quad 000111$

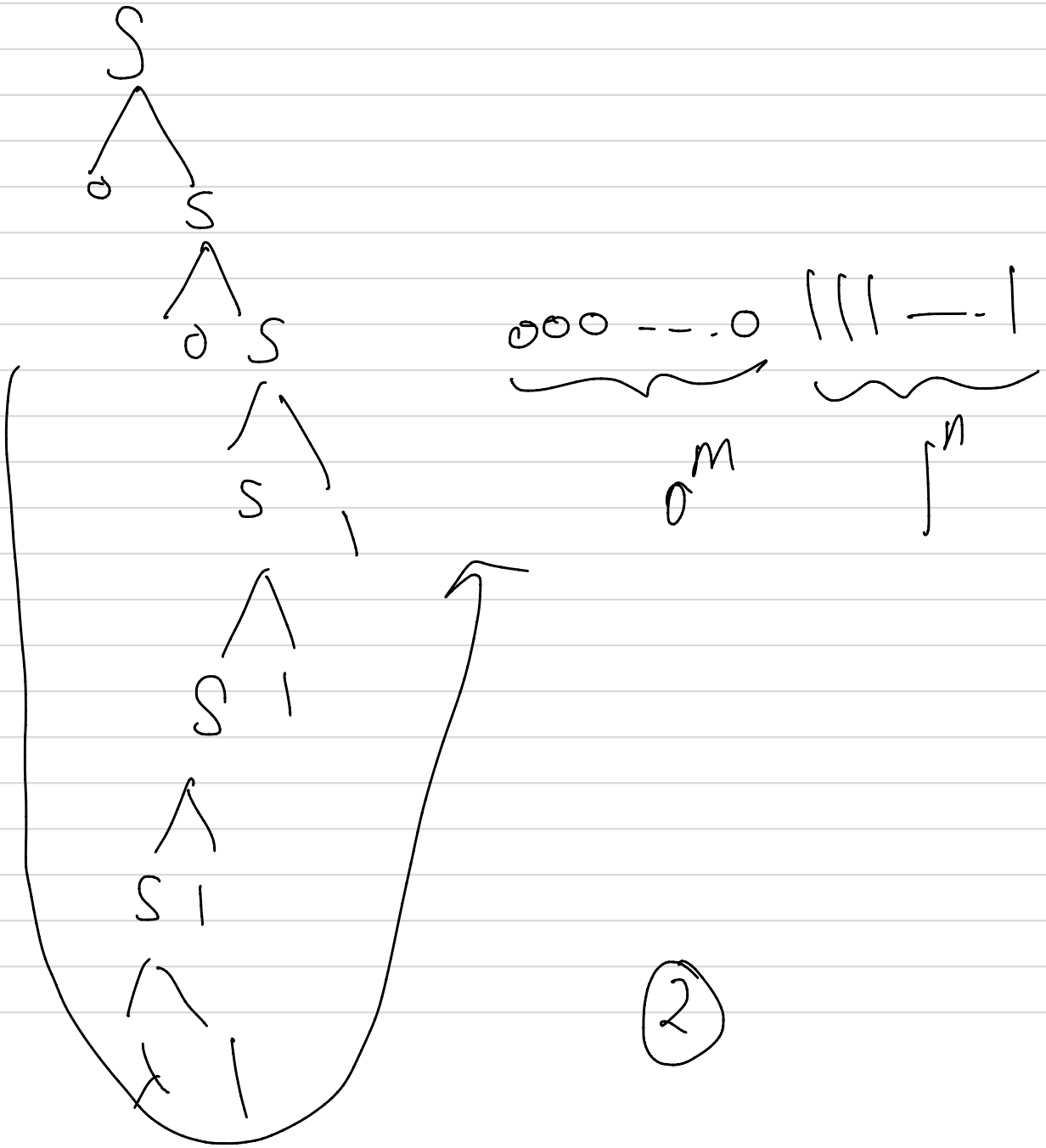
$$S \longrightarrow \lambda \mid 0S1$$



$$L = \{ 0^m 1^n \mid m, n \in \mathbb{N} \}$$

λ, 0001, 0111, ---.

$$S \to \lambda \mid 0S \mid S1$$



$$L = \{ (000)^n \mid n \in \mathbb{N} \}$$

$$S \rightarrow \lambda \mid 000S$$

$S \rightarrow 000S \rightarrow 000\lambda \quad 000$

$S \rightarrow 000S \rightarrow 000\ 000S \rightarrow 000\ 000\ 000\lambda$

$\vdots$

Grammar for a lang. of even # of 0's no 1.

$\lambda \checkmark$, $00 \checkmark$, $000 \notin L$, $0000 \in L$, ---

$S \rightarrow \lambda \mid 00S$

Palindromes:

BOB , KAYAK , - - -

$A = \{a, b\}$

$S \rightarrow a \mid b$

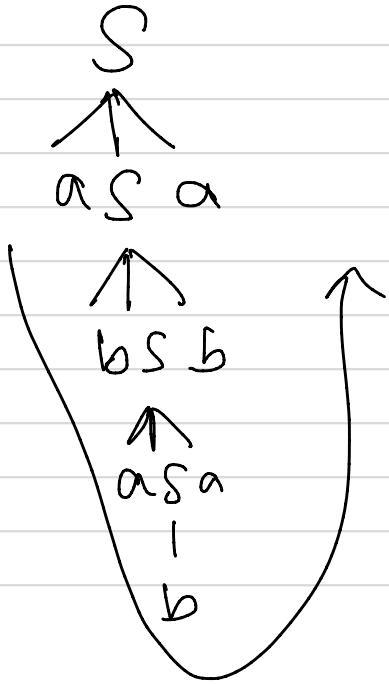
but

aba ✓

bbabb ✓

⋮

$S \rightarrow a \mid b \mid aSa \mid bSb$



abababa

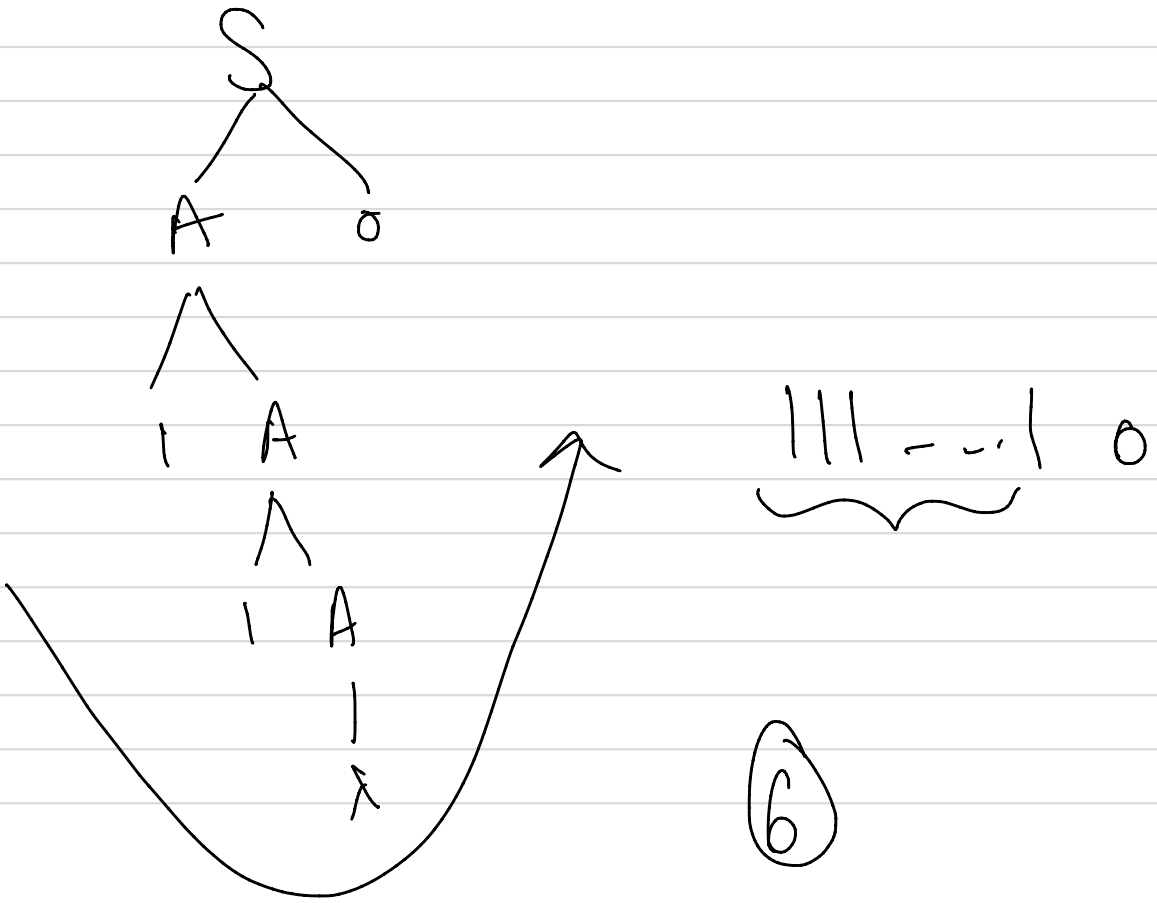
$$L = \{ 0^n \mid n \in \mathbb{N} \}$$

$$S \rightarrow 0S \mid \lambda$$

$$L = \{ 1^n 0 \mid n \in \mathbb{N} \}$$

$$S \rightarrow A0$$

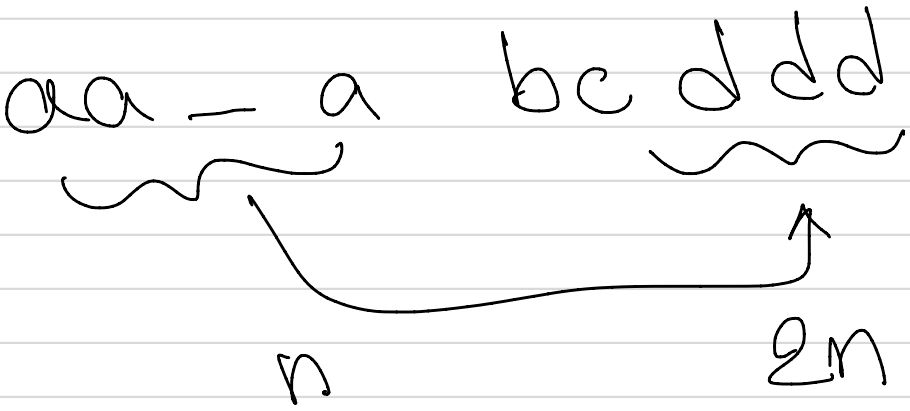
$$A \rightarrow 1A \mid \lambda$$



$$L = \{ a^n b^m c^m d^{2n} \mid n \geq 0, m > 0 \}$$

$m > 0 \Rightarrow$ $a \cdot b \cdot c \cdot d$

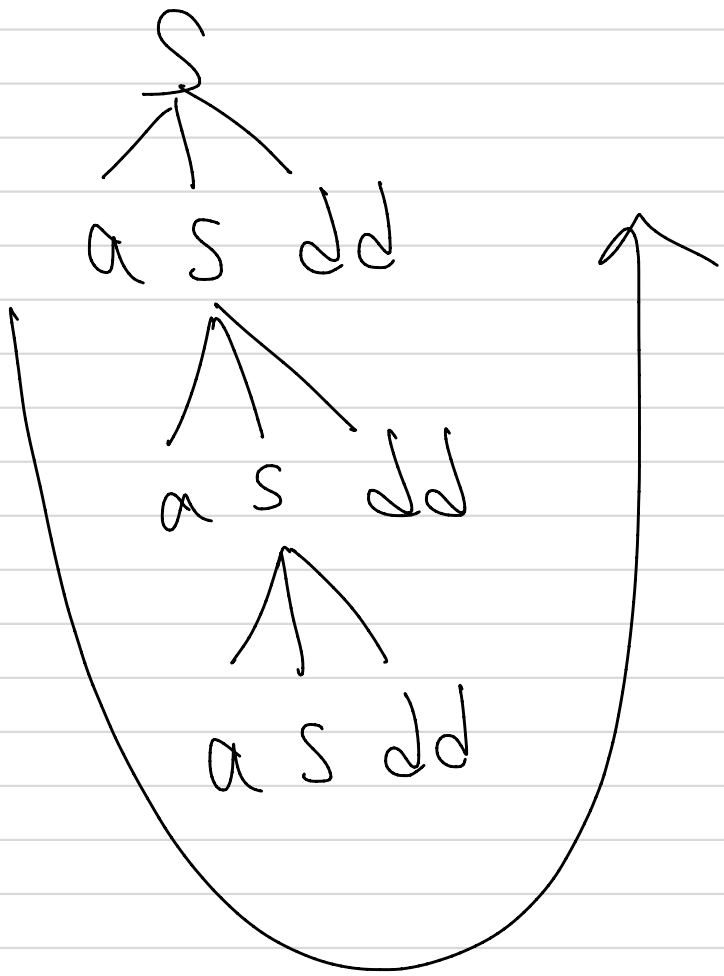
$bc \in L$



$S \rightarrow aSdd \mid A$

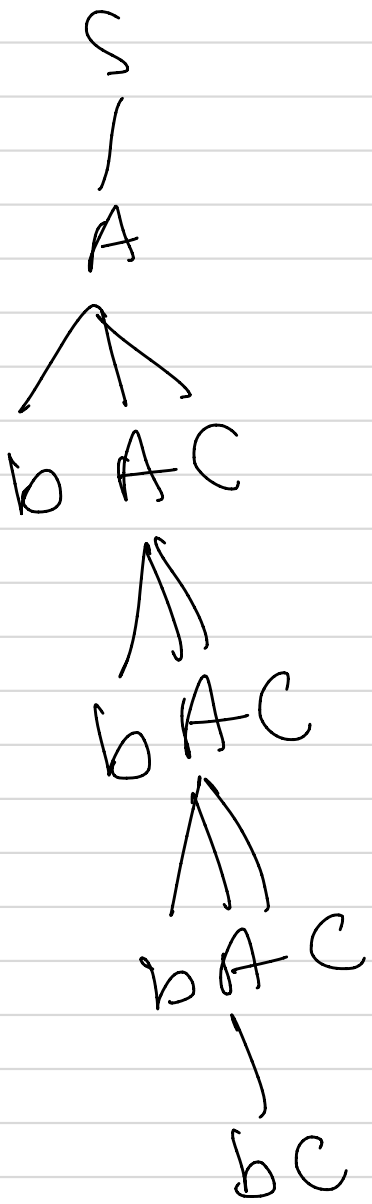
$A \rightarrow bc \mid bAC$

$S \rightarrow aSdd$



for each a $\rightarrow$ dd

$S \rightarrow A \rightarrow bAC$



$L = \{aa, bb\}$

$S \rightarrow aa \mid bb$

$L = \{aa, bb\}^*$

$S \rightarrow aaS \mid bbS \mid \lambda$

$L = \{ a b^n c \mid n \in N \}$

ac, abc, abbc, abbbc, — .

$S \rightarrow aBC$

$B \rightarrow \lambda \mid bB$