

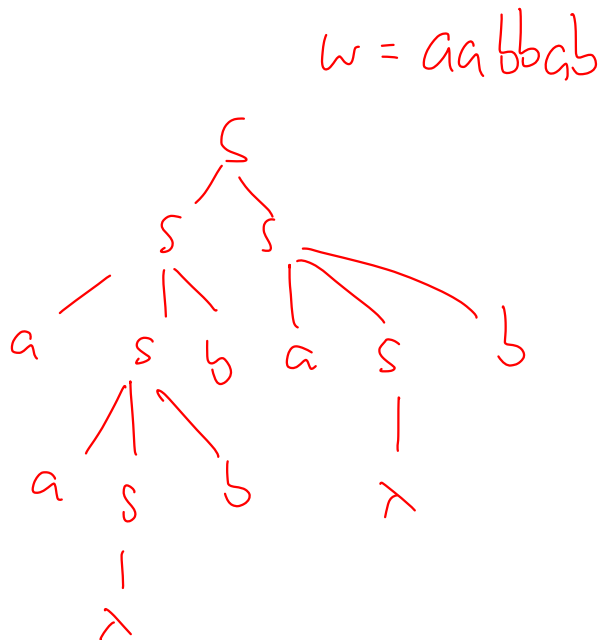
# Theory of Computation

## Exercise 9: (Context-free grammar part 2)

1. Show that  $L(G1) \neq L(G2)$ . *prove  $\rightarrow w \in L(G1)$  but  $w \notin L(G2)$*

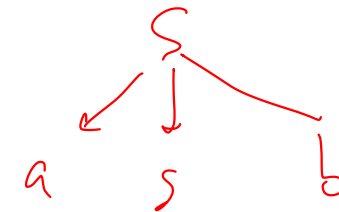
$G1 = (\{S\}, \{a, b\}, S, P1)$

$P1: S \rightarrow aSb \mid SS \mid \lambda$



$G2 = (\{S\}, \{a, b\}, S, P2)$

$P2: S \rightarrow aSb \mid \underline{abS} \mid \lambda$



*abSb  
anerkennung für*

*aSb*

*Wahlmann*

*abS*

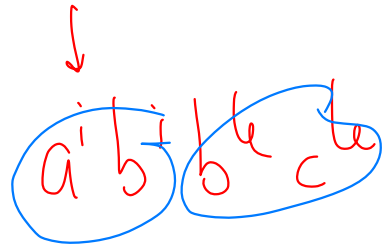
*Homogon*

*grü*

*∴ Wahlmann, tree für*

2. Find CFG for the language L.

$$L = \{ a^i b^j c^k : j = i + k \}$$



$$S \rightarrow AB$$

$$A \rightarrow aAb \mid \lambda$$

$$B \rightarrow bBc \mid \lambda$$

a\_pwd.pdf.

→ 8/4/25

\*3. Use CYK algorithm to find whether abab  $\in L(G)$ .

(Submit 7)

$G: S \rightarrow AB$

$A \rightarrow BB$

$A \rightarrow a$

$B \rightarrow AB$

$B \rightarrow b$

