ALBERT-LUDWIGS-
UNIVERSITÄT FREIBURG

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4. Presence Exercise Sheet for the Lecture
Computer Science Theory

Exercise 1: CFG to PDA
Consider the context-free grammar $G = (N, T, P, S)$ with $N = \{S, A\}, T = \{a, b\}$, and

$$P = \{S \to a \mid \varepsilon \mid aSbA$$
$$A \to b \mid AS\}$$

(a) Construct a PDA $\mathcal{A}$ which accepts the same language with the empty stack.

(b) Give a leftmost derivation of the word $aabb$ in G.

(c) Simulate an accepting run for the word $aabb$ in $\mathcal{A}$.
Write down the stack contents after each step.