Exercise 1: Pushdown automata
Consider the following PDA $A$ over $\Sigma = \{a, b\}$.

\[
\begin{align*}
& (Z_0, a, AZ_0), \\
& (A, a, AA) \\
& (A, a, \varepsilon)
\end{align*}
\]

(a) What is $L(A)$, i.e., the language accepted by $A$ with final states?

Hint: Decompose the problem:

- What happens in $q_0$ ($q_1$, $q_2$)?
- When can we go from $q_0$ to $q_1$ (from $q_1$ to $q_2$)?

(b) Construct a PDA which accepts the same language, but with the empty stack.

........................................ Sketch of solution ........................................

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

(b)