

4. Find a deterministic pushdown automaton that accepts the language  $\{w c w^R \mid w \in \{a, b\}^*\}$ .

5. Show that the language  $\{a^n b^m \mid n \neq m\}$  is deterministic context-free.

6. Show that the language  $L = \{w \in \{a, b\}^* \mid n_a(w) > n_b(w)\}$  is deterministic context-free.

3. Suppose that  $L$  is language over an alphabet  $\Sigma$ . Suppose that there is a deterministic pushdown automaton that accepts  $L$ . Show that  $L$  is deterministic context-free. That is, show how to construct a deterministic pushdown automaton that accepts the language  $L\$\$ . (Assume that the symbol  $\$$  is not in  $\Sigma$ .)