Advanced Topics in Automata
Exercise 9

Submission: July 1, 2003

Exercise

30% Define rigorously a reasonable version of 2-way pushdown automata.

30% Give a 2-way pushdown automaton that accepts the language:

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

10% Show that the emptiness problem for 2-way pushdown automata is undecidable.

30% Find the alphabet Δ, the Dyck set D (over the alphabet Δ), the regular set R (over the alphabet Δ), and the homomorphism $h : \Delta \to \{0, 1\}$ such that $h(D \cap R) = \{w \mid \sharp_0(w) = \sharp_1(w)\}$.