6th Coursework

9/3/2004


Given the following Pushdown Automaton (PDA) $P$

$$P = \langle Q = \{q_0, q_1\}, \Sigma = \{0, 1\}, \Gamma = \{0, 1, \#\}, \delta, q_0, \#, F = \{q_0\} \rangle$$

where $\delta$ is given by the following equations:

$$
\begin{align*}
\delta(q_0, 0, \#) &= \{(q_1, 0\#)\} \\
\delta(q_0, 1, \#) &= \{(q_1, 1\#)\} \\
\delta(q_1, 0, 1) &= \{(q_1, \epsilon)\} \\
\delta(q_1, 0, 0) &= \{(q_1, 00)\} \\
\delta(q_1, 1, 0) &= \{(q_1, \epsilon)\} \\
\delta(q_1, 1, 1) &= \{(q_1, 11)\} \\
\delta(q_1, \epsilon, \#) &= \{(q_0, \#)\} \\
\delta(q, w, z) &= \{\} \text{ everywhere else}
\end{align*}
$$

1. Construct sequences of Instantaneous Descriptions (IDs) for the words

$$01, 0110, 00, \epsilon$$

2. We use acceptance by final state. Which of the words from 1. are in $L(P)$ and which ones aren’t?

3. Describe $L(P)$ in one sentence!

4. What does it mean for a PDA to be deterministic? Is $P$ deterministic?