Assignment 15

Automata & Theory of Computation

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1. Construct an npda that accepts the language generated by a grammar with productions

$$S \rightarrow aSSSab|\lambda.$$

(null 제외)

$S \rightarrow aSSSab$

$S \rightarrow \lambda$

$\delta(q_0, \lambda, Z) = \{(q_1, SZ)\}$

$\delta(q_1, a, S) = \{(q_1, SSS)\}$

$\delta(q_1, \lambda, S) = \{(q_1, \lambda)\}$

$\delta(q_1, \lambda, Z) = \{(q_1, AZ)\}$

$\delta(q_1, a, A) = \{(q_1, B)\}$

$\delta(q_1, b, B) = \{(q_1, \lambda)\}$

$\delta(q_1, \lambda, Z) = \{(q_f, \lambda)\}$

2. Construct a context-free grammar for the language accepted by the npda $M = (\{q_0, q_1\}, \{a, b\}, \{A, z\}, \delta, q_0, z, \{q_1\})$, with transitions

$$\begin{aligned} \delta(q_0,\ a,\ z) &= \{\ (q_0,\ Az)\ \}, \\ \delta(q_0,\ b,\ A) &= \{\ (q_0,\ AA)\ \}, \\ \delta(q_0,\ a,\ A) &= \{\ (q_1,\ \lambda)\ \}. \end{aligned}$$

$$\begin{cases} S \to aA \\ A \to a \\ A \to bAA \end{cases}$$