Theory of Computation

Exercise 10: (Pushdown Automata)

Find Pushdown Automata for the following languages.

1. L1 = {
$$a^n b^{2n} : n \ge 0$$
 }

$$\begin{array}{c} 0, \lambda \rightarrow 11 \\ \hline \\ \lambda, 1 \rightarrow \lambda \\ \hline \\ 0, 1 \rightarrow \lambda \\ 0, 1 \rightarrow \lambda \\ \hline \\ 0, 1 \rightarrow \lambda \\ \\ 0, 1 \rightarrow \lambda \\ \hline \\ 0, 1 \rightarrow \lambda \\ \\ 0, 1$$

2. L2 ={ $w \in \{a,b\}^*: n_a(w) > n_b(w)$ }

$$\begin{array}{c} a, \lambda \rightarrow 1 \\ a, 0 \rightarrow \lambda \\ b, 1 \rightarrow \lambda \\ b, \lambda \rightarrow 0 \end{array}$$

$$\begin{array}{c} \lambda_{9} 1 \rightarrow \lambda \\ \hline \\ \gamma_{9} 1 \rightarrow \lambda \\ \hline \end{array}$$

$$a_{9}$ > 1$ b, $ > 0$
 $a_{9}0 \rightarrow \lambda$
 $a_{9}0 \rightarrow \lambda$
 $a_{9}1 \rightarrow 11$
 $b, 0 \rightarrow 00$
 $b, 1 \rightarrow \lambda$
 $a_{1} \rightarrow \lambda$
 $a_{2} \rightarrow \lambda$
 $a_{3} \rightarrow \lambda$
 $a_{1} \rightarrow \lambda$
 $a_{2} \rightarrow \lambda$
 $a_{3} \rightarrow \lambda$
 $a_{4} \rightarrow \lambda$
 $a_{2} \rightarrow \lambda$
 $a_{3} \rightarrow \lambda$
 $a_{4} \rightarrow \lambda$
 $a_{5} \rightarrow \lambda$$$

*3. L3 ={
$$a^n b^m a^{n+m}$$
: $n, m \ge 1$ }

(Submit 8)

