PS04-03

January 24, 2018

Consider grammar G:

$$S \to ABS|AB$$
$$A \to aA|a$$
$$B \to bA.$$

a. Are the following strings in $L(G)$?

i. $aabaab \notin L(G)$. This is because the only terminal in G is a.

ii. $aaaaba$ $S \to AB \to aAB \to aaAB \to aaaAB \to aaaaB \to aaaabA \to aaaaba$.

iii. $aabbaa \notin L(G)$. This is because a b is always followed by an a (rule S). If there are two bs in a string in this language, there are always at least 2 as in between.

iv. $abaaba$ $S \to ABS \to aBS \to abAS \to abaS \to abaAB \to abaaB \to abaabA \to abaaba$.

b. $G = \langle V, \Sigma, R, S \rangle$,
$L(G) = \{w \in \Sigma^* : S \overset{*}{\Rightarrow} w\}$
$L(G) = \{a^{i_1}ba^{j_1} \cdot ... \cdot a^{i_n}ba^{j_n} : i, j, n > 0\}$