Let $\Sigma$ be an alphabet. For a subset $\Sigma'$ of $\Sigma$ we denote the number of occurrences of letters of $\Sigma'$ in a word $w$ by $|w|_{\Sigma'}$, for $w \in \Sigma^*$. If $\Sigma' = \{a\}$, then we simply write $|w|_a$.

1. State the pumping lemma for regular languages and use it to show that

$$L = \{w \in \{a,b\}^* \mid |w|_a < |w|_b\}$$

is not regular (make use of the game against the opponent).