

Theory of Computation

Exercise 1: (Mathematic preliminary, Language, String)

1. Let $\Sigma = \{a, b\}$ and $L = \{aa, bb\}$. Describe \bar{L} by a set notation.

$$\bar{L} = \{\lambda, a, b, ab, ba\} \cup \mathcal{U}$$

$$= \{w \in \{a, b\}^* : |w| \geq 3\}$$

2. Find five strings which are in each of the following languages.

a) $L = \{w \in \{a\}^*: |w| \bmod 3 \neq |w| \bmod 2\}$

→ only a
 $\{aa, aaa, aaaa, aaaaa, aaaaaa, aaaaaa, aaaaaa, aaaaaa\}$

b) $L = \{w \in \{a, b\}^*: n_a(w) \geq n_b(w) + 1\}$ → $\text{จำนวน } a \geq \text{จำนวน } b + 1$

Where $n_a(w)$ means the number of a's in string w.

$\{a, aa, ab, abb, aab, aabb, aabab\}$
 $0 \geq 0+1$ ✓, $1 \geq 0+1$ ✓, $0 \geq 1+1$ ✗, $1 \geq 1+1$ ✗, $1 \geq 2+1$ ✗
จำนวน b < a