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I

α is a RE

$L(\alpha)$ is the language expresed by α

Example

$\alpha = \boxed{aa^*}$

$L(\alpha) = \boxed{\{aa^n \mid n \geq 0\}}$

2 different ways of expessing L

II

$\alpha = ab$; $\beta = c$ $L(\alpha+\beta) = L(\alpha) \cup L(\beta) = \{ab, c\}$

Note: take into account the operations with languages!

$\alpha = ab$ $\alpha^* = (ab)^*$

$L(\alpha^*) = L(ab)^* = [L(ab)]^* =$

$= \{ab\}^* = \{\lambda, ab, abab, ababab, \dots\}$

II ① $\alpha = (a+b+\dots+z)^*$

$L(\alpha) = L(a+b+\dots+z)^* = [L(a+b+\dots+z)]^*$

$= [\{a\} \cup \{b\} \cup \dots \cup \{z\}]^* = [a, b, \dots z]^*$

$= \{\lambda, a, b, \dots z, aa, ab, ac, ad, \dots az, \dots\}$

Ex. $\alpha = (0+1)^*$ $L(\alpha) = \{\underbrace{\lambda, 0, 1, 00, 01, 10, 11, 000, \dots}_{\text{all binary numbers}}\}$

② $L(0^*10^*) = L(0^*) \cdot L(1) \cdot L(0^*) =$

$\{\lambda, 0, 00, \dots\} \cdot \{1\} \cdot \{\lambda, 0, 00, \dots\} =$

$= \{010, 0010, 001, 100, \dots\}$

Always one 1

③ $L(01+000) = L(01) \cup L(000) = \{01, 000\}$

④ $L(\alpha) = \{a, aa, ab, ac, aab, aac, abc \dots\}$

Always one a at the beginning

⑤ $L(\alpha) = \{a, bc, bba\}$