

CSC 220

11/12/2020

RE

Expression

10^*

strings

a 1 followed by
any # of 0's

$0(0+1)^*$

All strings begining
by at least one
zero.

$0+1$

0 or 1

$(11)^*$

even # of 1's

1

RE: $(aa)^* (bb)^* b$

what is L ?

of a's even

of b's odd

$$L_1 = \{ a^{2n} b^{2m+1} \mid m, n \geq 0 \}$$

$$L_2 = \{ a^{2n} b^{2n+1} \mid n \geq 0 \}$$

$$L_1 \neq L_2$$

in L_2

$$n=0$$

$$n=1$$

$$n=2$$

$$\begin{array}{l} a^0 b^1 \\ a^2 b^3 \\ a^4 b^5 \end{array}$$

$$aa.b \notin L_2$$

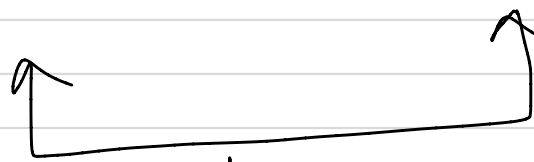
(2)

RE: Set of strings of one or more
0's followed by a 1.

$0 \cdot 0^* \cdot 1$

Contain at least 2 0's

$(0+1)^* \cdot 0 \cdot (0+1)^* \cdot 0 \cdot (0+1)^*$



③

RE: bit strings that begin and end with the same symbol.

$$\lambda + 0 \cdot (0+1)^* \cdot 0 + 1 \cdot (0+1)^* \cdot 1$$

$0+1$

should be here too

λ

$$L(0 + 1^* \cdot 01) = L(0) \cup L(1^* \cdot 01)$$

$$= \{0\} \cup (L(1^*) \cdot L(0) \cdot L(1))$$

$$= \{0\} \cup (\{1, 11, 111, \dots\} \cdot \{0\} \cdot \{1\})$$

$$= \{0\} \cup (\{0, 10, 110, 1110, \dots\} \cdot \{1\})$$

$$= \{0\} \cup \{01, 101, 1101, 11101, \dots\}$$

$$= \{0, 01, 101, 1101, 11101, \dots\}$$

$$\begin{aligned}
 L(x + 1) &= L(x) \cup L(1) \\
 &= \{x\} \cup \{1\} \\
 &= \{x, 1\}
 \end{aligned}$$

$$L(x \cdot 1) = L(1) = \{1\}$$

or

$$\begin{aligned}
 L(x \cdot 1) &= L(x) \cdot L(1) \\
 &= \{x\} \cdot \{1\} = \{1\}
 \end{aligned}$$

(6)

$$\begin{aligned}
 L(\phi + 1) &= L(\phi) \cup L(1) \\
 &= \phi \cup \{1\} = \{1\}
 \end{aligned}$$

$$\begin{aligned}
 L(\phi \cdot 1) &= L(\phi) \cdot L(1) \\
 &= \phi \cdot \{1\} = \phi
 \end{aligned}$$

$$L(\phi + \lambda + 1 + 01) = ?$$

$$\begin{aligned}
 &L(\phi) \cup L(\lambda) \cup L(1) \cup L(01) \\
 &= \phi \cup \{\lambda\} \cup \{1\} \cup \{01\} = \{\lambda, 1, 01\}
 \end{aligned}$$

(7)

$\uparrow \cdot 0^*$

$$L(1) \cdot L(0)^* = \{1\} \cdot \{\lambda, 0, 00, 000, \dots\}$$

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