

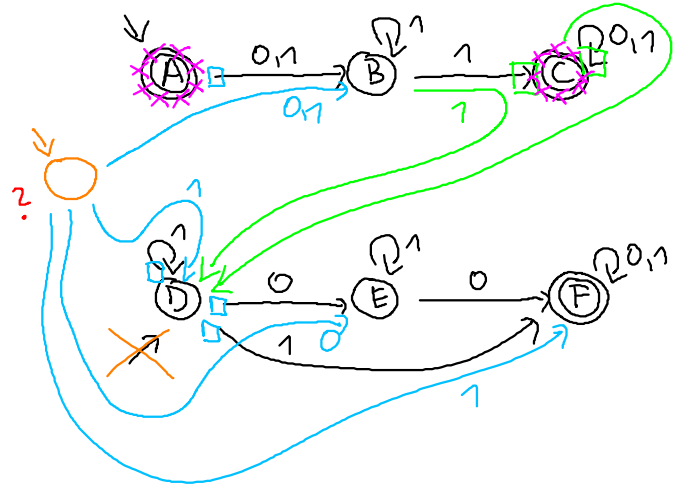
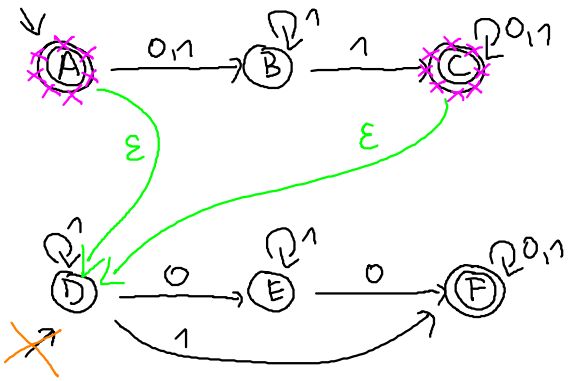
L_1 :

	0	1
$\leftarrow A$	$\{B\}$	$\{B\}$
B		$\{B, C\}$
$\leftarrow C$	$\{C\}$	$\{C\}$

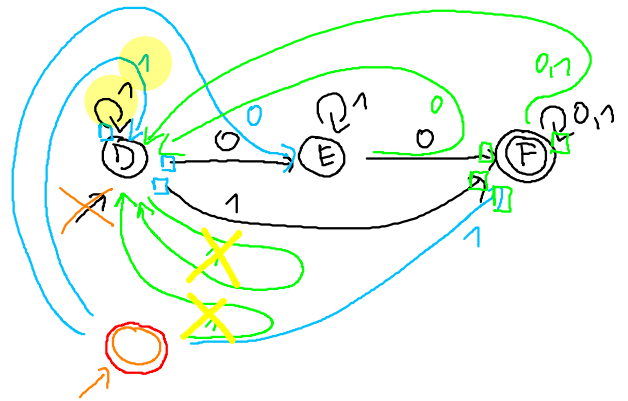
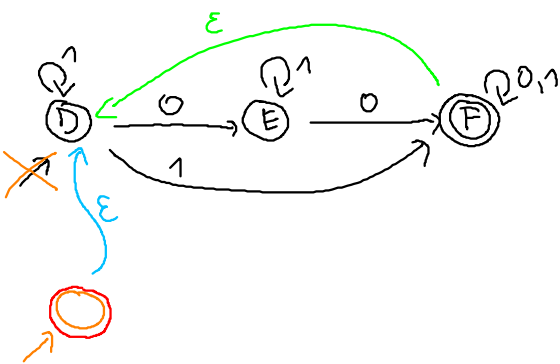
$\overline{L_1}$:

	0	1
$\rightarrow A$	$\{B\}$	$\{B\}$
\leftarrow	$\{\}$	$\{B, C\}$
$\rightarrow B, C$	$\{C\}$	$\{B, C\}$
$\rightarrow C$	$\{C\}$	$\{C\}$
\leftarrow	$\{\}$	$\{\}$

$L_1 \cdot L_2$



L_2^*



ВЫРАЗ

НОМНОТА

$a \in \Sigma$

$$\left[\begin{array}{l} a \\ \varepsilon \\ \phi \end{array} \right. \quad \begin{array}{l} h(a) = \{a\} \\ h(\varepsilon) = \{\varepsilon\} \\ h(\phi) = \{\} \end{array}$$

r_1, r_2

$$\left[\begin{array}{l} (r_1 + r_2) \\ (r_1 \cdot r_2) \\ r^* \end{array} \right. \quad \begin{array}{l} h(r_1 + r_2) = h(r_1) \cup h(r_2) \\ h(r_1 \cdot r_2) = h(r_1) \cdot h(r_2) \\ h(r^*) = (h(r))^* \end{array}$$

~~r^+
 $r^{\{3,5\}}$~~

1.1 $(0+1)^* 0110 (0+1)^*$

1.2 $((0+1)(0+1)(0+1))^* \cdot (0+1)$

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

$(000 + 001 + 010 + 011 + 100 + 101 + 110 + 111)^* (0+1)$

$((0+1)(00 + 01 + 1(0+1)))^* (0+1) \cdot \varepsilon + \phi$

1.3 $0^* 1 0^* 1 0^* 1 0^* \cdot (0+1)^*$

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

1.6 $a(a+b)^* a + b(a+b)^* b + \varepsilon + a + b$

1.7 $a b (bb)^* + \varepsilon (bb)^* = (ab + \varepsilon) (bb)^*$

1.8 $(aaa)^* (a + aabbb + b) (bbb)^*$

$$\begin{aligned}
 \textcircled{1} \quad 0^*(0^*+1^*) &= \underbrace{0^* \cdot 0^*}_{= 0^*} + 0^*1^* = 0^* \cdot \underbrace{(\varepsilon + 1^*)}_{= 1^*} \\
 &= 0^* + 0^*1^* = 0^* \cdot \varepsilon + 0^* \cdot 1^* = 0^* \cdot (\varepsilon + 1^*) \\
 &= 0^*(1^*) = \underline{\underline{0^*1^*}}
 \end{aligned}$$

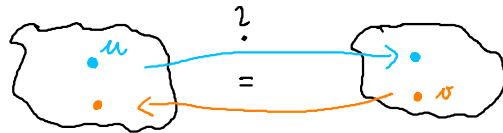
$$\textcircled{2} \quad 11^* + \underbrace{0^*0 + \varepsilon}_{= 0^*} = 11^* + 0^* = \underbrace{11^* + \varepsilon}_{= 1^*} + 0^* = \underline{\underline{1^* + 0^*}}$$

$$A^*(A+B)^* = (A+B)^*$$

$$(A+\varepsilon)(A+B)^* = (A+B)^*$$

$$\textcircled{3} \quad 0^*(1+\varepsilon) \underbrace{0^*(0+1)^*}_{= 0^*(1+0)^*(1+0)^*} = 0^*(1+\varepsilon) \underbrace{(0+1)^*}_{= (1+0)^*(1+0)^*} = 0^*(1+\varepsilon)(0+1)^* = \underbrace{0^*(1+0)^*(1+0)^*}_{= 0^*(0+1)^*} = \underline{\underline{(0+1)^*}}$$

$$\begin{aligned}
 0^* \cdot (0+1)^* &\stackrel{?}{=} (0+1)^* \\
 \text{h. } \underbrace{0^* \cdot (0+1)^*}_{\text{blue box}} &= \text{h. } \underbrace{(0+1)^*}_{\text{orange box}}
 \end{aligned}$$

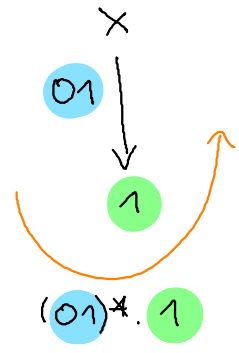


\Rightarrow	$\varepsilon \cdot \varepsilon$	$= \varepsilon$	✓	}	✓	}	\Leftrightarrow
	$\varepsilon \cdot (0+1)(0+1)^*$	$= (0+1)(0+1)^*$	✓				
	$00^* \cdot \varepsilon$	$= 00^*$	✓				
	$00^* \cdot (0+1)(0+1)^*$	$= 00^*(0+1)(0+1)^*$	✓				

\Leftarrow

3.1 $X = 01X + 1 \rightarrow X \rightarrow 01X \mid 1$

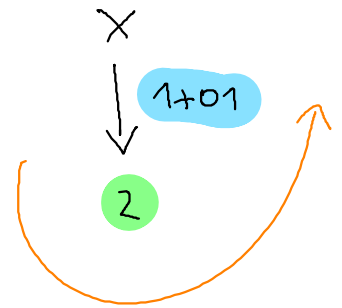
$X = (01)^* \cdot 1$



$X = 01X + 1$
 $(01)^*1 = 01[(01)^*1] + 1$
 $= (01)(01)^*1 + 1$
 $= (01)^* \cdot 1$
 $L = P \checkmark$

3.2 $X = X1 + X01 + 2$
 $= X(1+01) + 2$

$X = 2 \cdot (1+01)^*$



3.3 $X = (0^*1 + 1)(X + 1)$
 $= (0^*1 + 1)X + (0^*1 + 1) \cdot 1$
 $= (0^*1)X + 0^*11 \Rightarrow X = (0^*1)^* \cdot 0^*11$

3.4 $X = X + X(1 + 0^*1 + \epsilon)$
 $= X[\epsilon + 1 + 0^*1 + \epsilon]$
 $= X[\epsilon + 0^*1] + \cancel{X} + \phi \checkmark$
 $X = \phi \cdot (\epsilon + 0^*1)^* = \phi$

