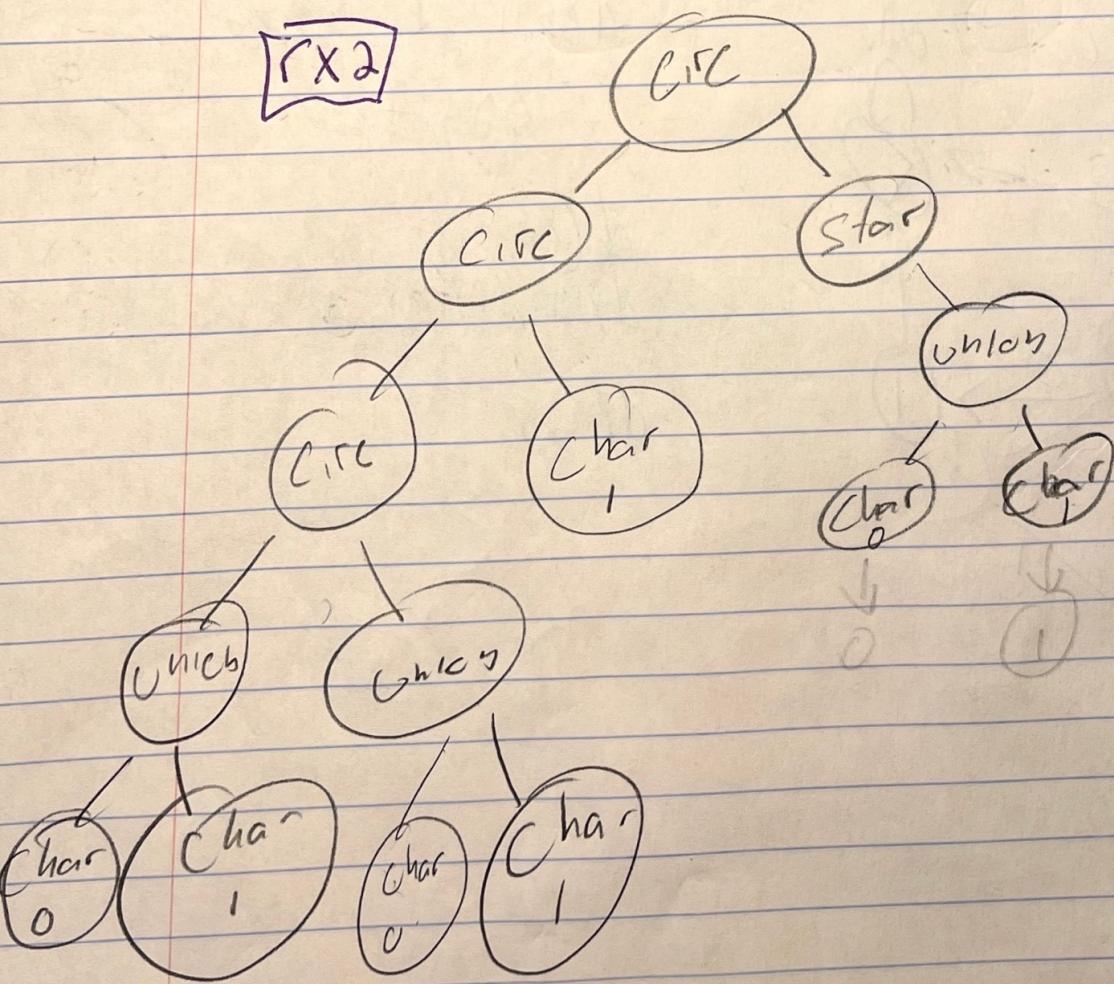


Zero = RE-Char('0') $\Rightarrow \{0\}$
One = RE-Char('1') $\Rightarrow \{1\}$

CUs = REG-Union(zero, one) = {0, 1}

(CUI)* \circ (1 \circ ((CUI) \circ (CUI)))



R X S

R X S

$$\mathcal{J}^* = (\mathcal{E}, \{\mathbf{0}\}, \{\mathbf{00}\}, \{\mathbf{000}\})$$

$$0^* \circ 1 = 0^* / \{\mathcal{E} \cup \{\mathcal{E}\}\} = 1$$

$$\{\mathbf{0}, \mathbf{1}, \mathcal{E}\} = \mathbf{01}$$

$$\{\mathcal{E}, \{\mathbf{0}\}\} = \mathbf{10}$$

$$\{\mathbf{0}, \mathbf{1}, \mathbf{0}\}$$

$$\mathbf{100}$$

$$\mathbf{001}$$

$$((01) \circ (01))^*$$

$$\{\mathbf{0}, \mathbf{1}\} \circ \{\mathbf{0}, \mathbf{1}\} = \{\mathbf{0}, \mathbf{0}\}, \{\mathbf{0}, \mathbf{1}\}, \{\mathbf{1}, \mathbf{0}\}, \{\mathbf{1}, \mathbf{1}\}$$

$$(\{\mathbf{0}, \mathbf{1}\} \circ \{\mathbf{0}, \mathbf{1}\})^* = \{(0,0), (0,1), (1,0), (1,1), \\ (00,0,0), (0001), (0010), (0011) \\ (0100), (0101), (0110), (0111), \dots \\ \dots (000000)\}$$

Ex 4

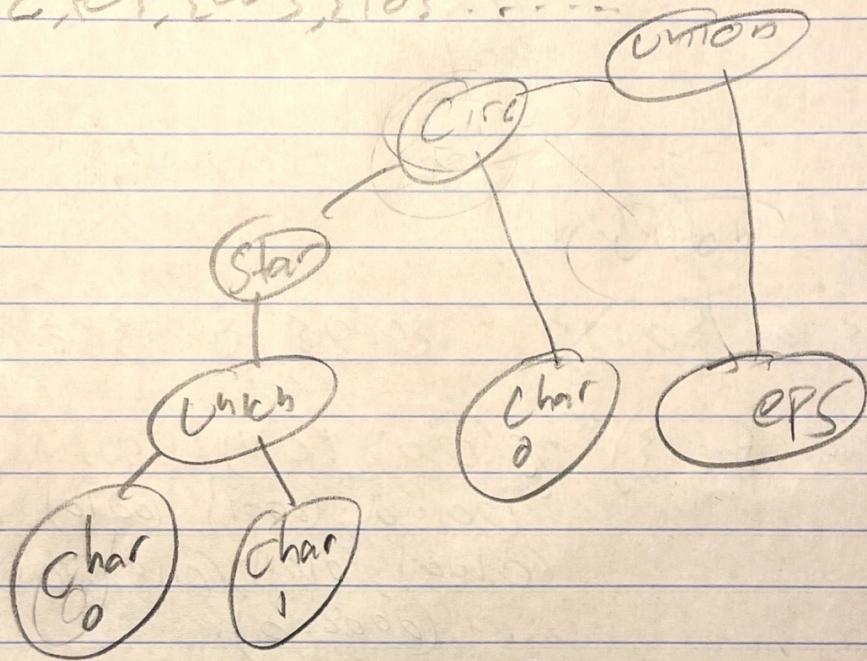
Ex 5

$(01)^* \cdot 0 \cup \epsilon$

$\{0, 1\}^* \Rightarrow (\{\{0\}, \{1\}, \{00\}, \{01\}, \{10\}, \{11\}, \{000\}, \dots)$

$\{0, \{00\}, \{10\}, \{000\}, \{010\}, \{100\}, \{110\}, \{0000\}, \dots$

$\Rightarrow \{\epsilon, 00, 10, 000, 100, \dots\}$



~~$(01)^* \cdot 0 \cup \epsilon$~~
 ~~$\{0, 1\}^* \Rightarrow \{\epsilon, 00, 10, 000, 100, \dots\}$~~
 ~~$(01)^* = \{0, 1\}^*$~~

[rx5]

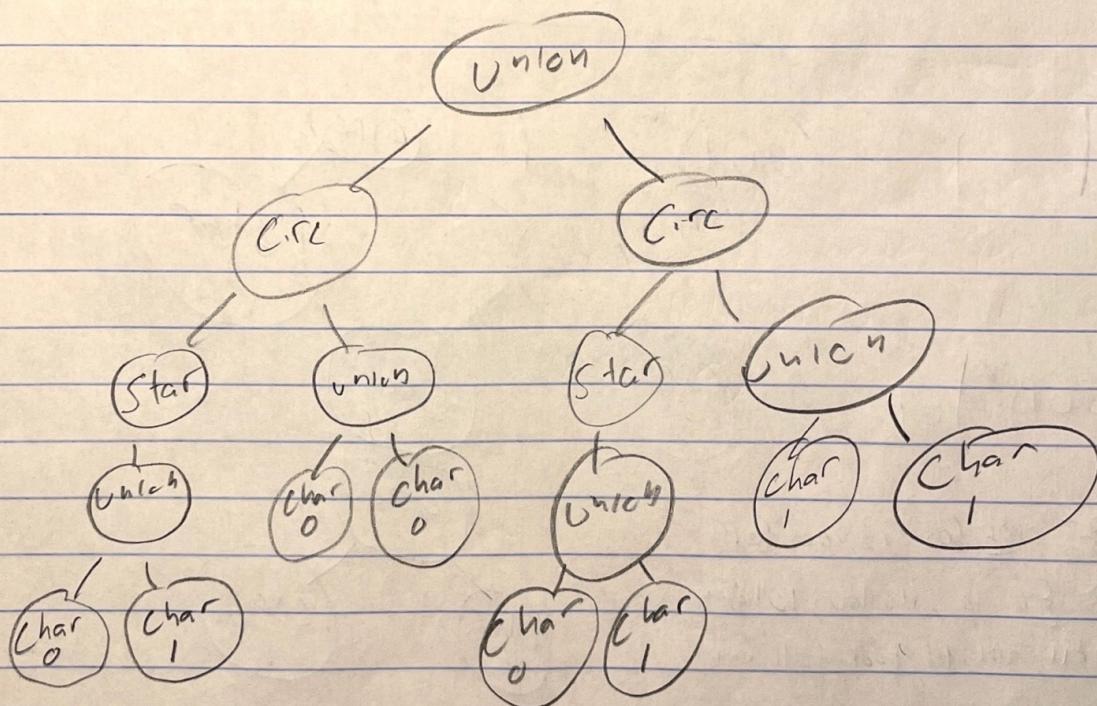
$$((0\cup 1)^*)^* \cdot (0\cup 0) \bigcup ((0\cup 1)^*)^* \cdot (1\cup 1)$$

~~(0\cup 1)^*~~ {000, 111, 0000, 100, 0111, 1111, 00000} ...

$$\{0, 1\}^* = \{ \emptyset, \{0\}, \{1\}, \{00\}, \{01\}, \{10\}, \{11\}, \{000\} \}$$

$$\cdot \{0, 0\} \Rightarrow \{\{0, 0\}, \{000\} \{100\} \{0000\} \{0100\}, \{1000\} \{1100\} \{00000\}\}$$

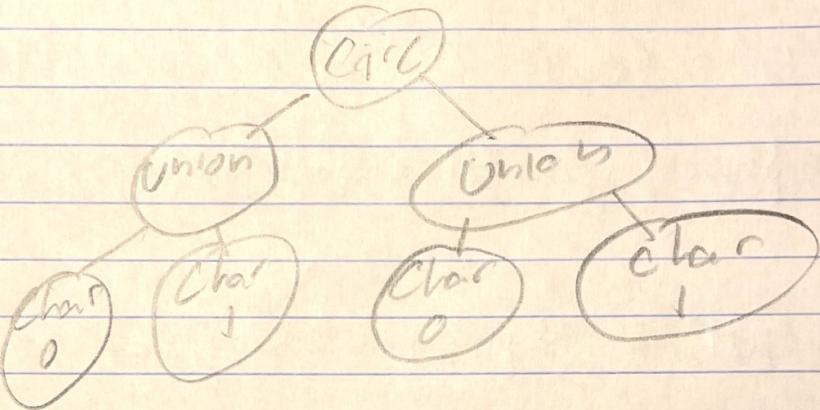
$$(0\cup 1)^* \cdot (1\cup 1) \Rightarrow \{\{11\}, \{011\}, \{111\}, \{0011\}, \{0111\}, \{1011\}, \{1111\} \} \dots$$



$\boxed{rx6}$

$$(0\cup 1) \circ (0\cup 1)$$

$$\{0, 1\} \circ \{0, 1\} = \{00, 01, 10, 11\}$$



$\boxed{rx7}$

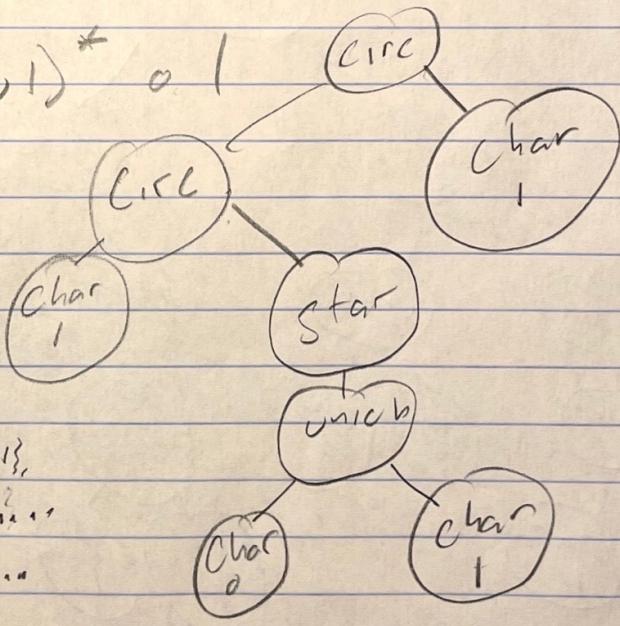
$$1 \circ (0\cup 1)^* \circ 1$$

$$(1 \circ (0\cup 1)^*) \circ 1$$

$$\{0, 1\}^* = \{ \epsilon, 00, 01, 10, 11, 000, 001, \dots \}$$

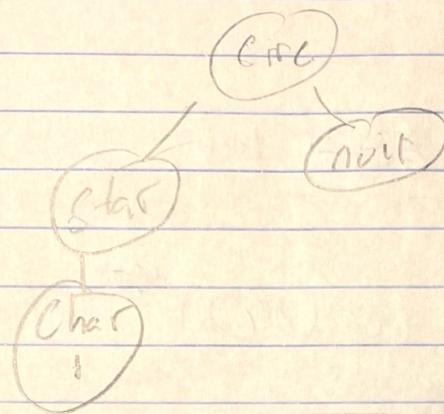
$$1 \circ \Rightarrow \{1, 10, 11, 100, 101, \dots \}$$

$$01 \Rightarrow \{11, 101, 111, 1001, 1011, \dots \}$$



(RX8)

$1^* \emptyset$



~~101xx1~~

(RX9)

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

$$\{0, 1\}^* = \{00, 01, \dots\}$$

$$\{0, 0\}^* = \{\epsilon, 00, 0000, 000000, \dots\}$$

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

$$\{1, 1\}^* = \{\epsilon, 11, 111, 1111, \dots\}$$

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

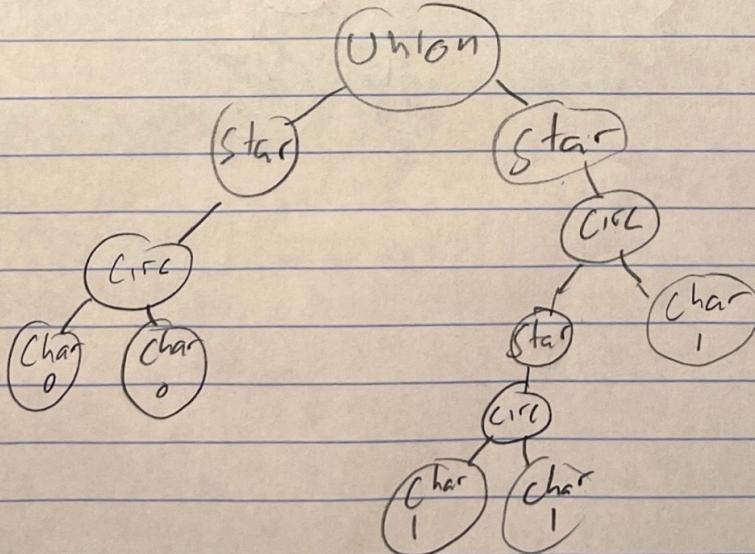
$$\{01\}^* = \{00, 01, 0101, \dots\}$$

$$01 = \{1, 11, 1111, 111111, \dots\}$$

$$\cup = \{\epsilon, 00, 0000, 000000, \dots\}$$

$$1, 11, 111$$

Union



~~$(001)^*$~~

~~$= \{01\}^* = \{\text{EOL}, 0101, 010101, \dots\}$~~

~~3x7~~

~~$(100)^*$~~

~~$= \{10\}^* = \{\text{E}, 10, 1010, 101010, \dots\}$~~

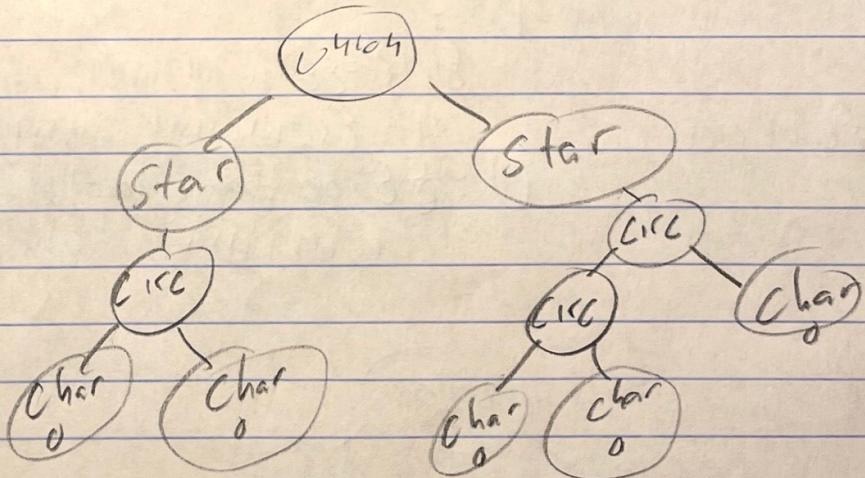
~~Rx10~~

$(0 \cdot 0)^* \cup (0 \cdot 0 \cdot 0)^*$

~~$\{00\}^* = \{\text{E}, 00, 0000, 00000, \dots\}$~~

~~$\{000\}^* = \{\text{E}, 000, 000000, 00000000, \dots\}$~~

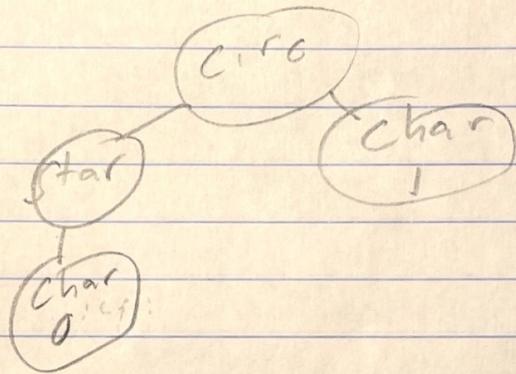
$\cup = \{\text{E}, 00, 000, 0000, 00000, 000000, \dots\}$



$$0^* = \{\epsilon, 0, 00, 000, \dots\}$$

(XII)

$$0^{*0} = \{1, 01, 001, 0001, \dots\}$$



$$\{0, \epsilon\} \quad (0 \cup \epsilon) \cdot 1^*$$

$$1^* = \{\epsilon, 1, 11, 111, \dots\}$$

(XII)

$$\Rightarrow \{0, 01, 011, 0111, \dots\}$$

$$\{1, 11, 111, \dots\}$$

