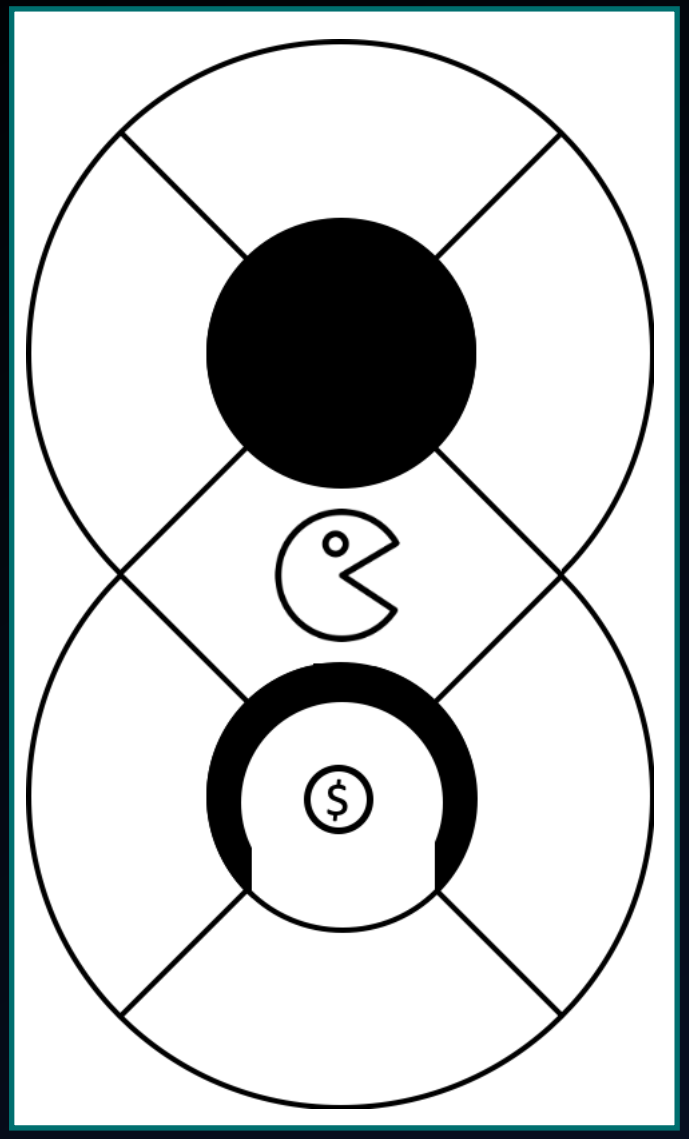
Pac-Man Winning Strategy



c = clockwise

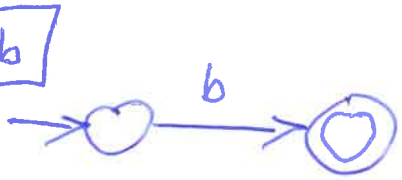
a = anti-clockwise

u = up

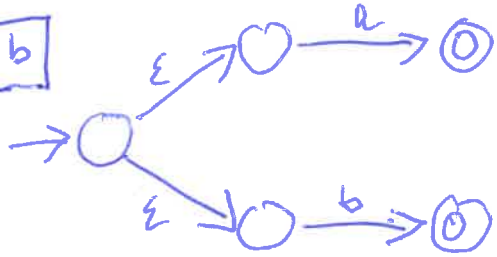
((cccc)* U (aaaa)*)*(aau)

a

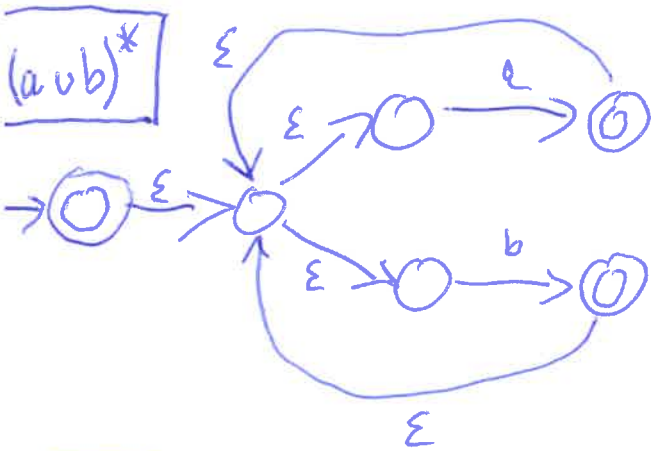
b



a ∪ b

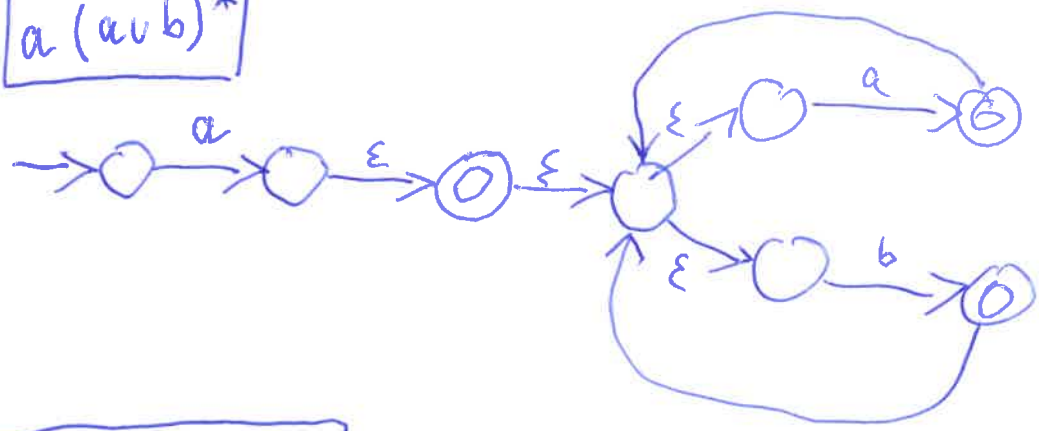


(a ∪ b)*

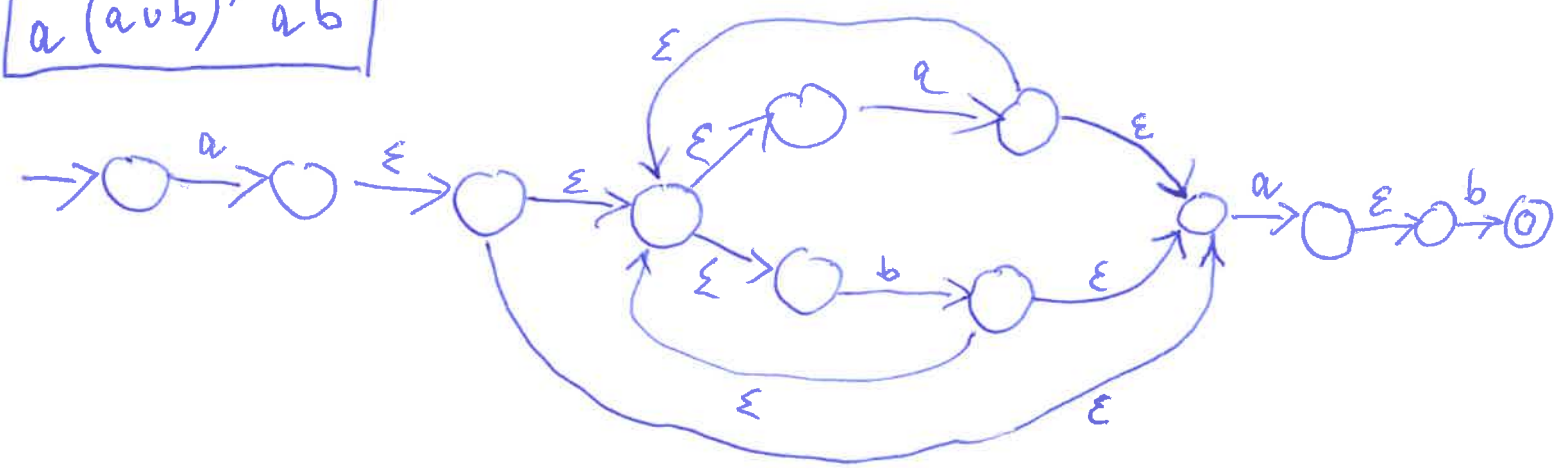


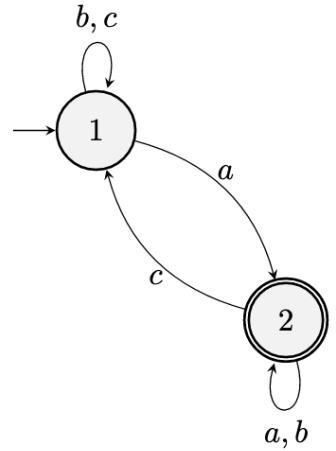
a b

a (a ∪ b)*



a (a ∪ b)* a b





Solution:

$L_1 = a \cdot L_2 \cup b \cdot L_1 \cup c \cdot L_1$
$L_2 = a \cdot L_2 \cup b \cdot L_2 \cup c \cdot L_1 \cup \epsilon$

rewrite L_2

$L_2 = (a \cup b) \cdot L_2 \cup c \cdot L_1 \cup \epsilon$

use lemma 2.8.2 correctly

$L_2 = (a \cup b)^*(c \cdot L_1 \cup \epsilon)$

substitute L_2 into L_1 which leads to

$L_1 = a(a \cup b)^*(c \cdot L_1 \cup \epsilon) \cup b \cdot L_1 \cup c \cdot L_1$
$L_1 = a(a \cup b)^*c \cdot L_1 \cup a(a \cup b)^* \cup b \cdot L_1 \cup c \cdot L_1$
$L_1 = (a(a \cup b)^*c \cup b \cup c) \cdot L_1 \cup a(a \cup b)^*$

Use lemma 2.8.2 correctly

$L_1 = (a(a \cup b)^*c \cup b \cup c)^*a(a \cup b)^*$