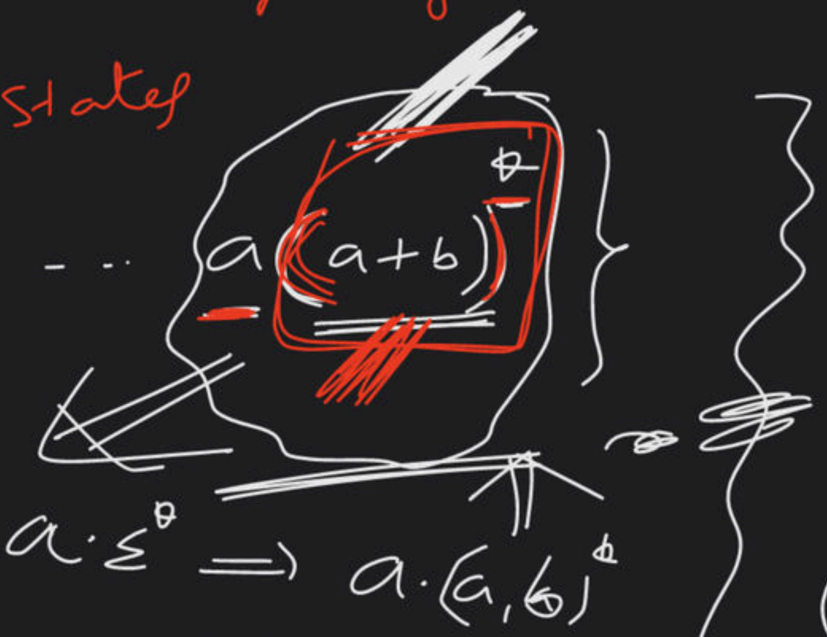
DFA Construction - II

Complete Course on Theory of Computation

Subbarao Lingamgunta • Lesson 5 • Feb 8, 2022

① Construct minimal DFA that accepts all strings of a's & b's where in everything string letter should be a.

$L = \{a, aa, ab, \ldots, bb, \ldots\}$ → 1-length ⇒ 1+1 ⇒ 2-states



$\Sigma = a, b$

$\Sigma^0 = (a+b)^{\phi}$

$(a,b)^{\phi}$

$a \cdot \epsilon = a$

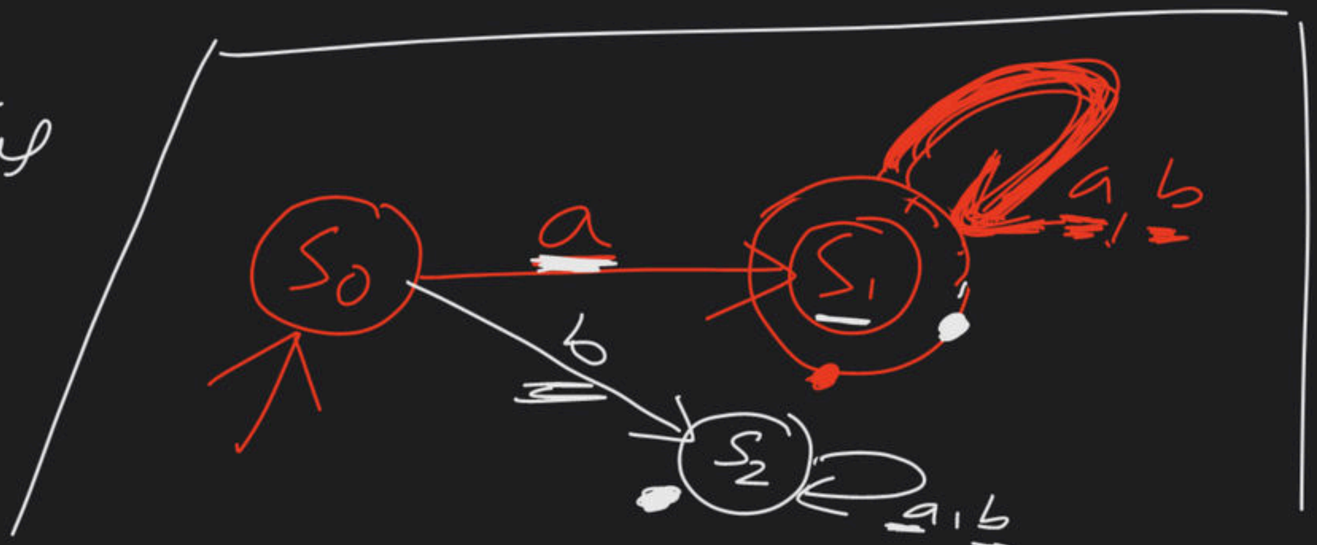
$a \cdot (a) = aa$

$a \cdot (b) = ab$

$a \cdot (aa) = aaa$

$a \cdot (bb) = abb$

3-states



ex 6)

Construct DFA $L = \{$ set of all strings over a & $b\}$

(or)

$\Sigma^* \Rightarrow (a,b)^* \Rightarrow (a+b)^*$

1-state $\Leftarrow 1+0 \Leftarrow 0$

$\epsilon \vee$

$a \vee$

$b \vee$

$aa \quad \vee$

$\vdots$

bb

$\vdots$

Note: start state by default ∈ itself final state & accepted.

	a	b
$\rightarrow s_0$	s_1	s_2
$*s_1$	s_1	s_1
$\underline{s_2}$	$\underline{s_2}$	s_2

$a \cdot \Sigma^{*} \Rightarrow a \cdot (a+b)^{*} \Rightarrow a(a+b)^{*}$

- $a \cdot b = ab$

a concatenation b

↓

a followed by b

- $a + b = a, b$

a union b

- a (or) b

$a \cdot (a+b)^{1} \Rightarrow a \cdot a = aa$

$a \cdot b = ab$

CMDFA L = { set of all strings over a, b
excluding ε }

⇒ Σ^+ (or) $(a, b)^+$

|L| (state)

$\Vert$

$(a+b)^+$

$\Vert$

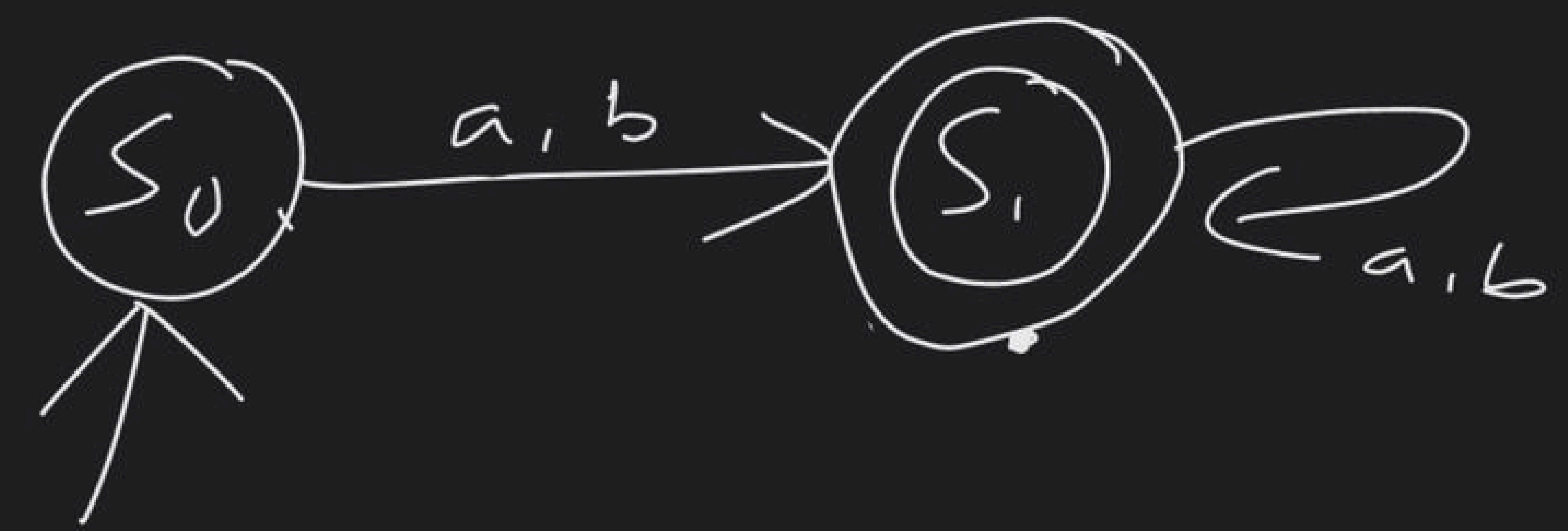
1-Len

a ✓

b ✓

aa
⋮ ✓
bb

aaa
⋮
bbb

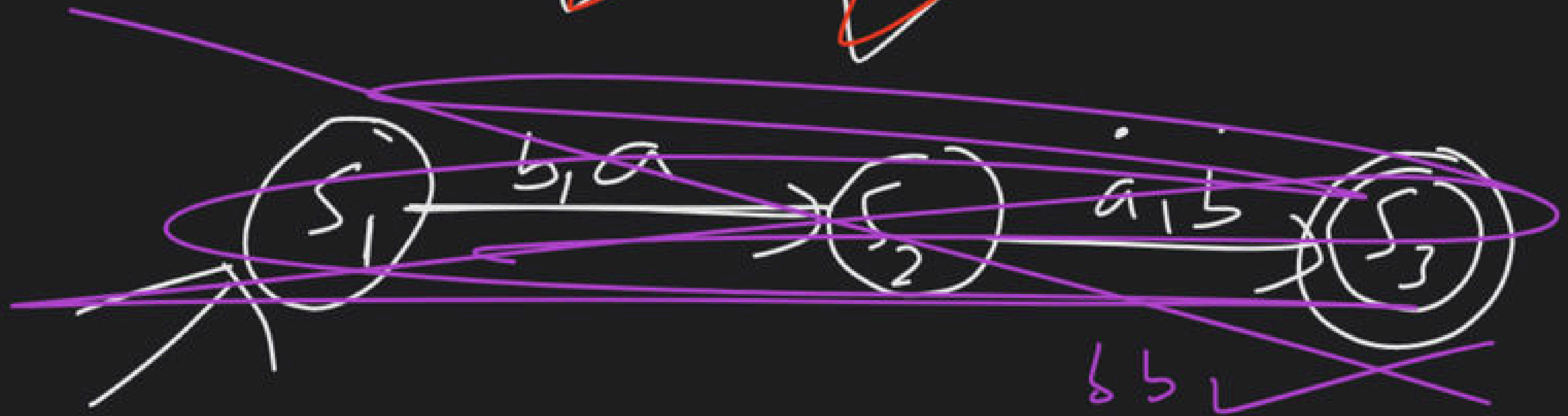


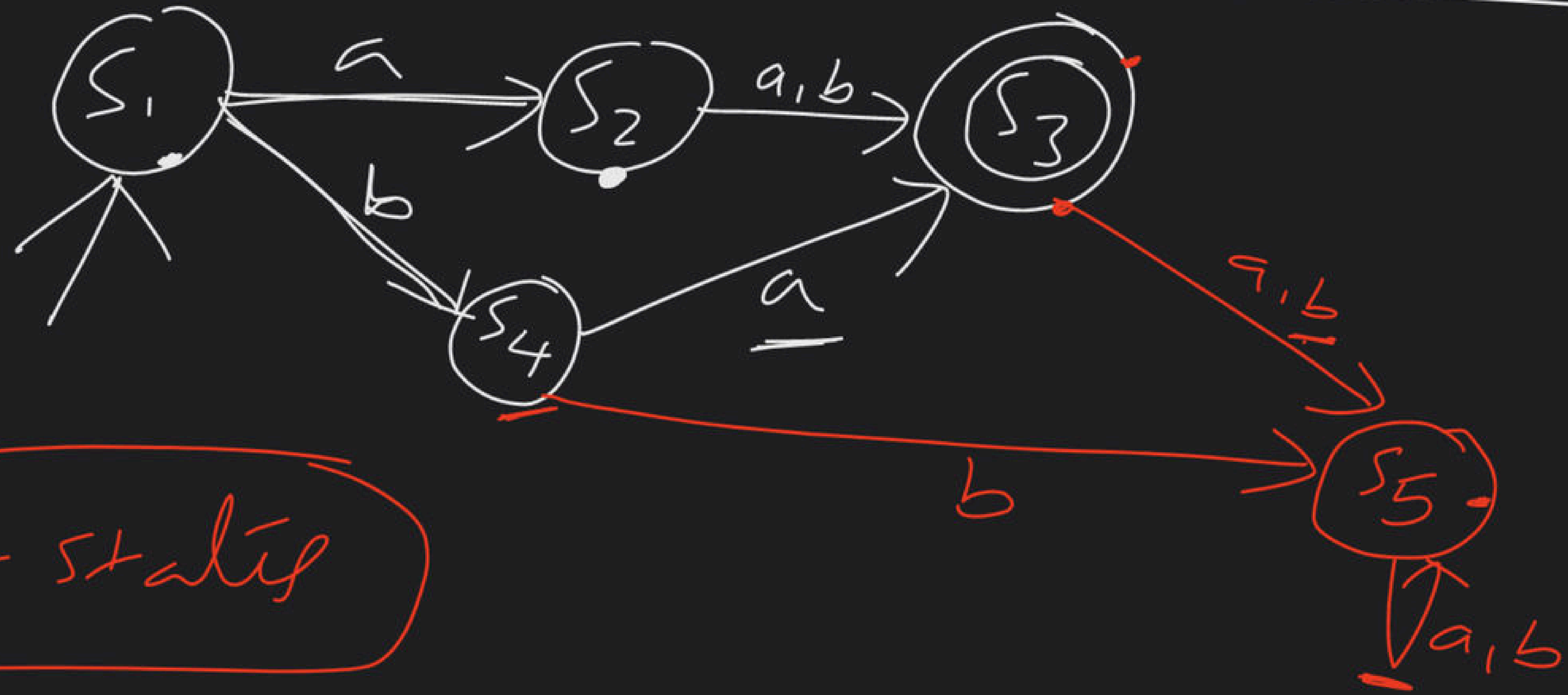
S.S && F.S
not same ⇒ ~~ε~~

CM DFA L = { ab, aa, ba }

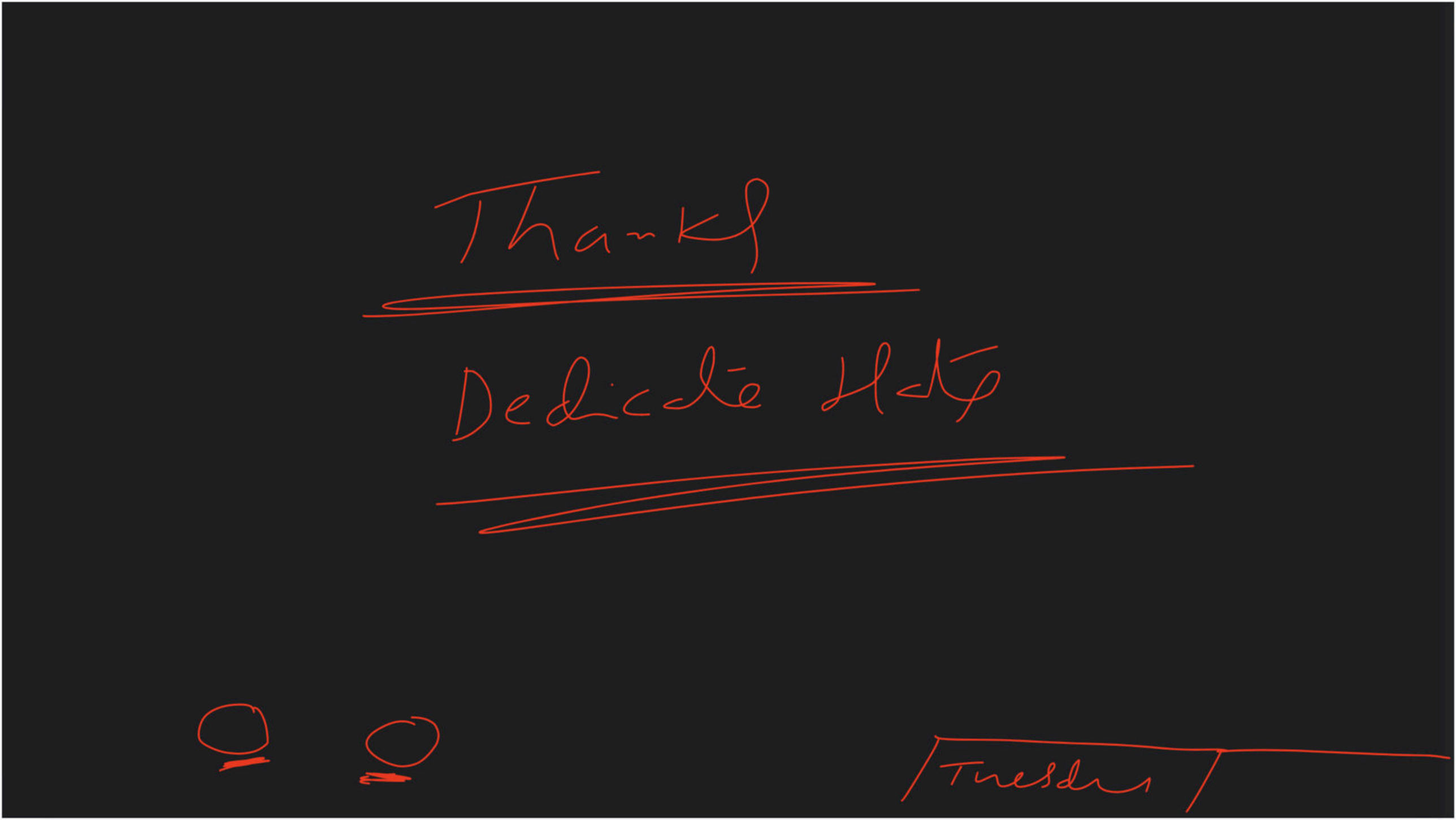
2+1 || 3 states

Infinite language only loops there





5-states


Thank
Dedicate
Tuesday

DFA – Finite lange – Dead State marking