

DFA Construction - V

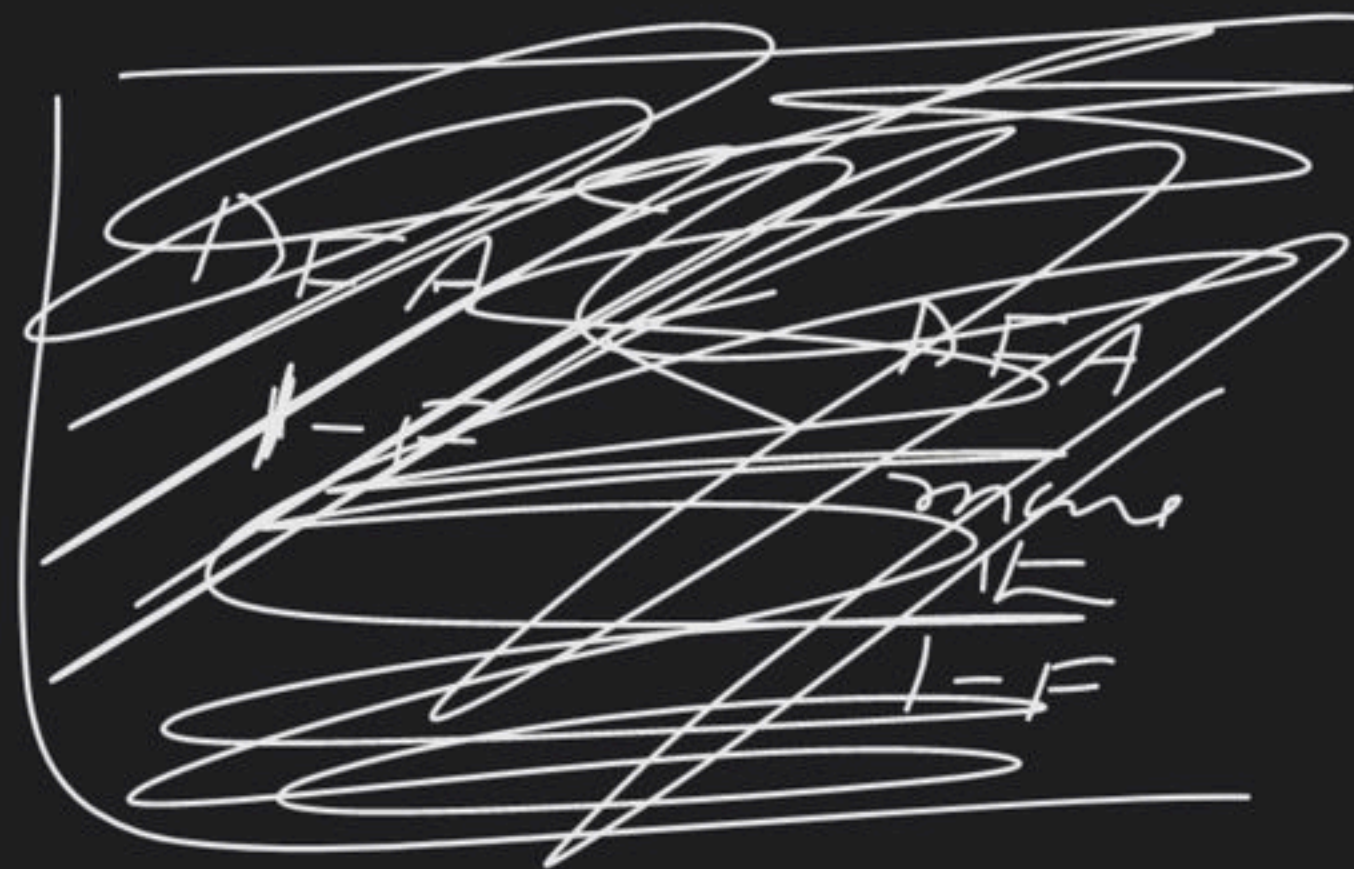
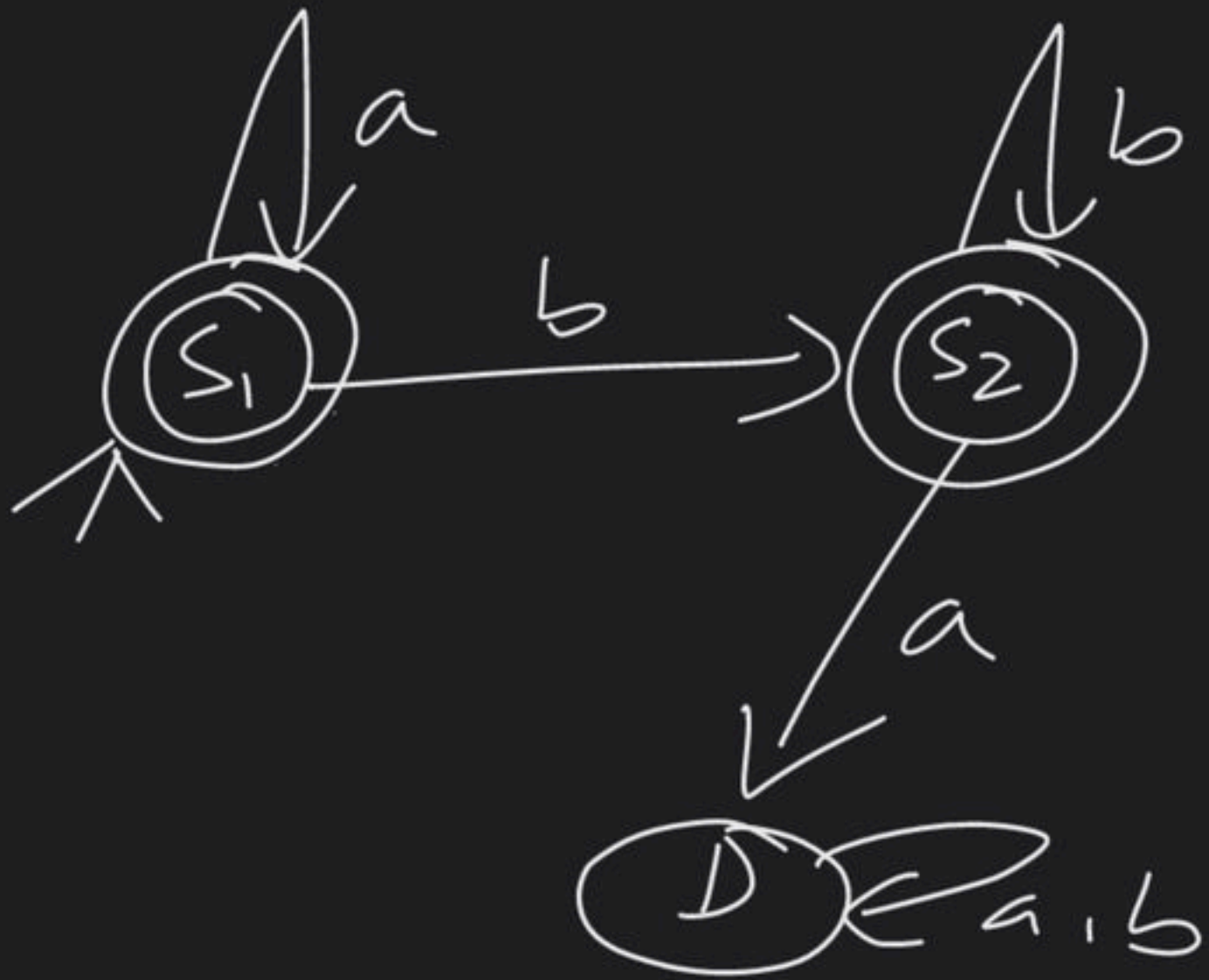
Complete Course on Theory of Computation

plate see

(13th - feb) Yesterday
6am 88

(12th - feb) D-B- Yesterday
6am TOC - machine del

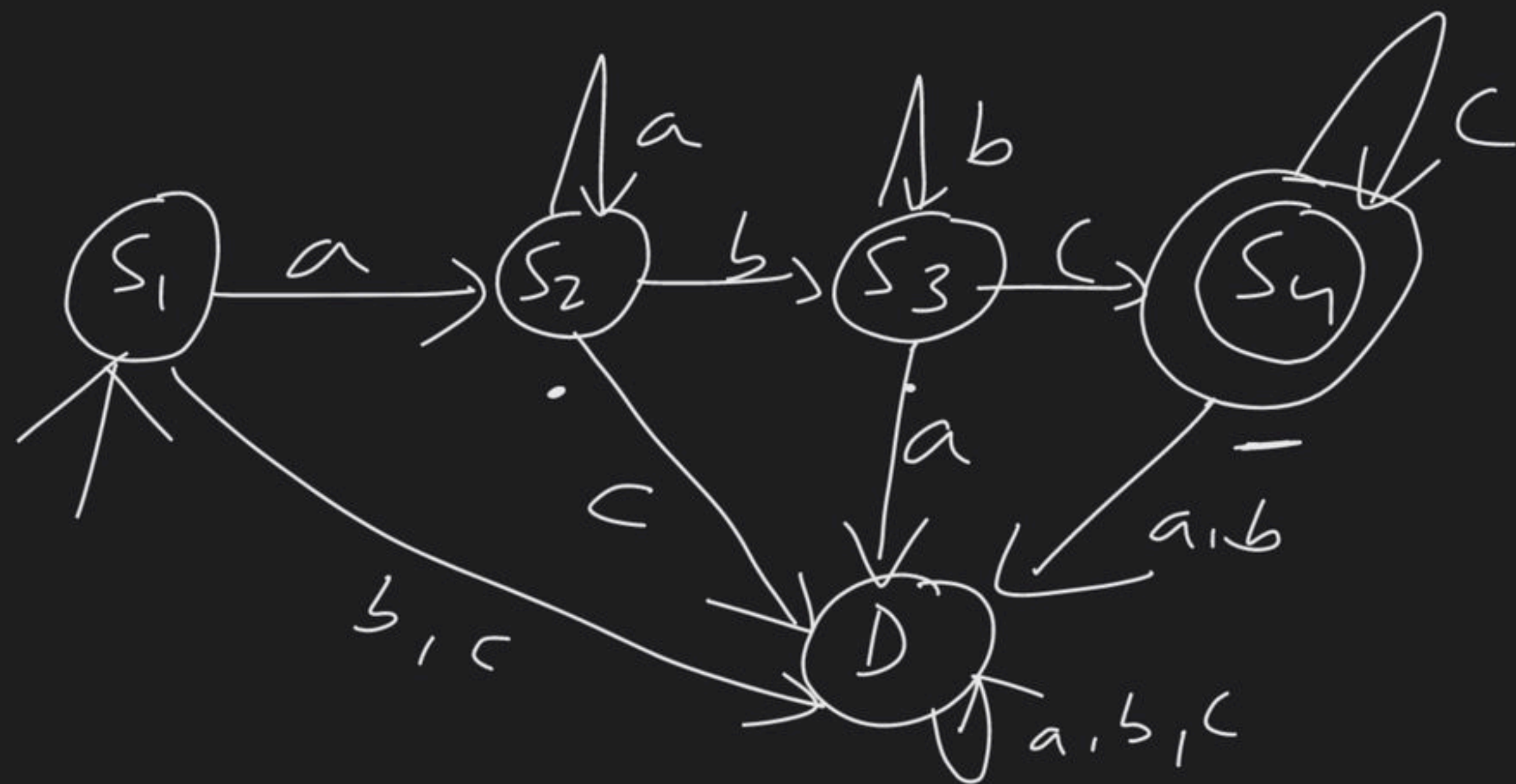
CM-DFA



$$L = \{ a^l b^m c^n \mid m, n, l \geq 1 \} \Rightarrow a^+ b^+ c^+$$

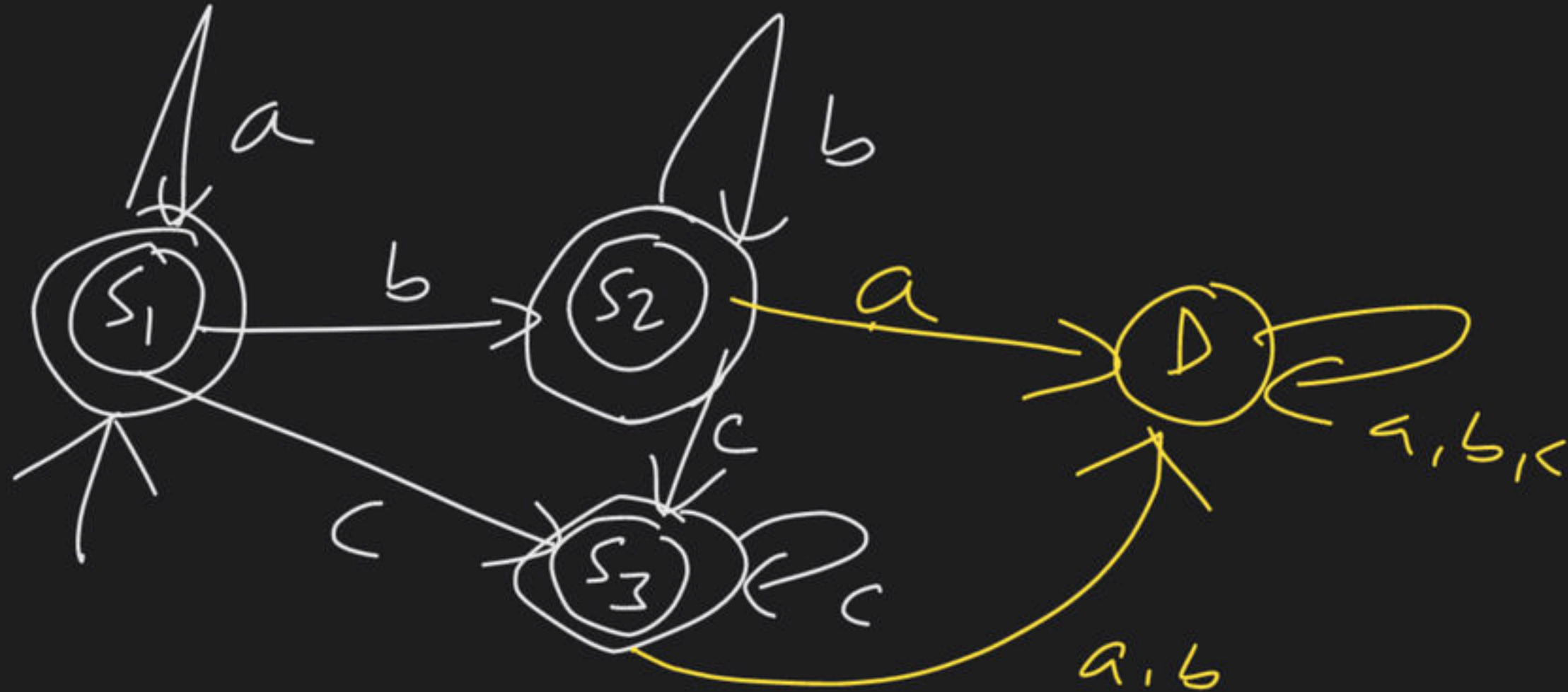
$$\Rightarrow 3-L = 4-5$$

$\Rightarrow abc, aabc, aabbc, aabcc, aabbbc, \dots$



$$L = \{a^l b^m c^n \mid l, m, n \geq 0\} \Rightarrow a^* b^* c^*$$

\Rightarrow $\epsilon, aaaa \dots$ / $aaaa \dots abbb \dots b$ / $a \dots ab \dots bc \dots$
 $bbb \dots$ / $bbb \dots bccc \dots c$
 $cccc \dots$ / $aaa \dots acccc \dots c$

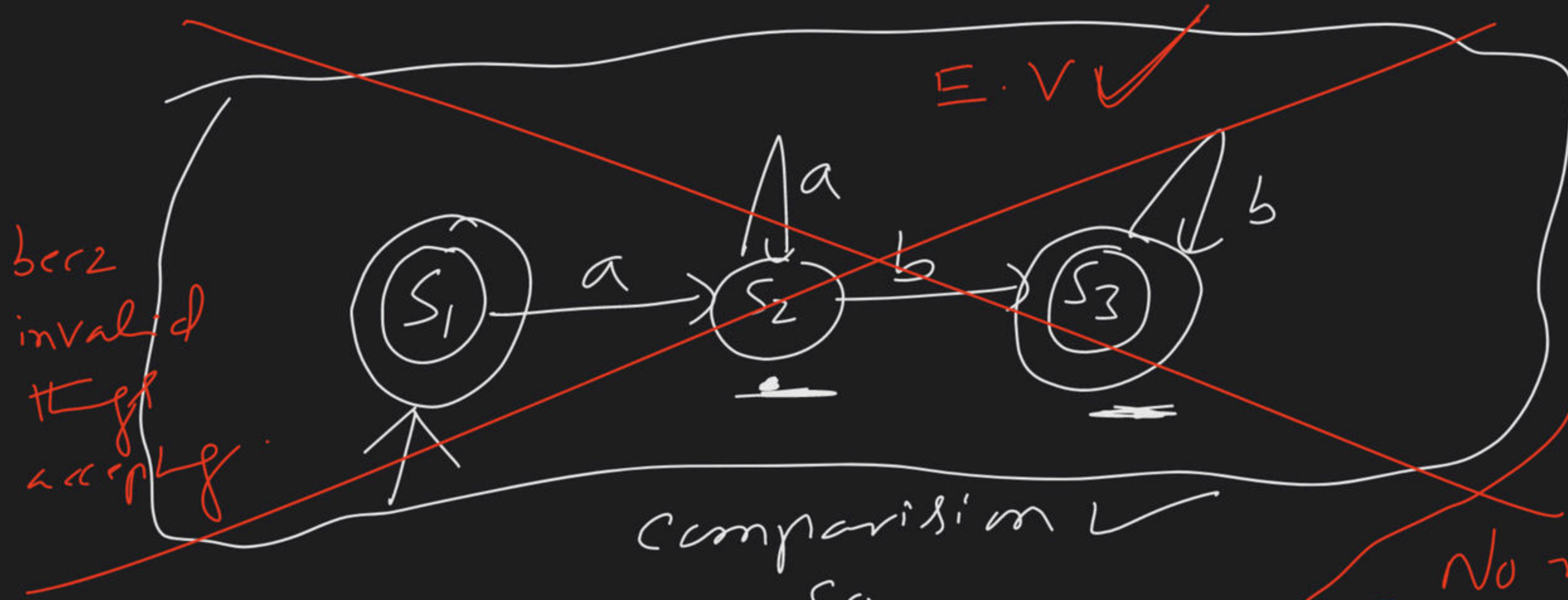


$$L = \{ a^n b^n \mid n \geq 0 \}$$

$\Rightarrow \epsilon, ab, a^2b^2, a^3b^3, a^4b^4, \dots$

NFA

A-V ✓
I-I-V also
can't accept



becz
invalid
if
accept

E.V.V ✓

Comparison ✓

So

FA \Rightarrow non-regular

A-V ✓

A-IV ✓

DFA

• No machine will
accept I-invalid
also

$$L = \left\{ a^m b^n \mid m, n \geq 0 \right\}$$

~~FA~~ \Rightarrow N.R.LV

$$m = n$$

$$L = \left\{ a^m b^n \mid m, n \geq 0 \text{ and } m \neq n \right\}$$

~~FA~~ \Rightarrow N.R.LV

$$L = \left\{ a^m b^n \mid m, n \geq 0 \text{ and } m = n + 5 \right\}$$

~~FA~~ \Rightarrow N.R.LV

$$L = \left\{ a^m b^n \mid m, n \geq 0 \text{ and } 5 = n - m \right\}$$

||

$$L = \{ a^m b^n \mid m, n \geq 0 \}$$

28

$$\{ m+n=10 \} \Rightarrow \text{FA} \checkmark$$

0, 10
1, 9

2, 8

3, 7

4, 6

5, 5

6, 4

7, 3

8, 2

9, 1

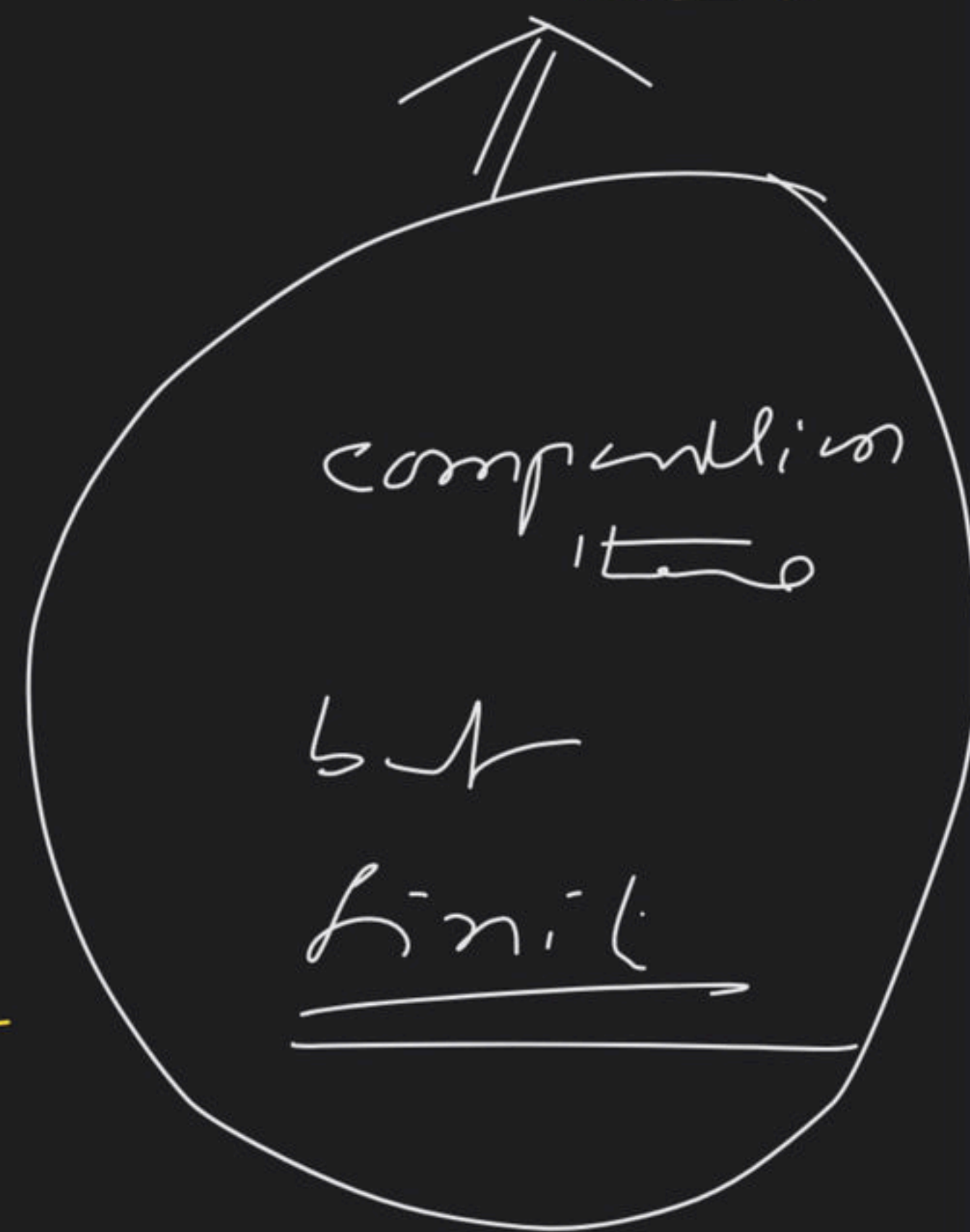
10, 0

RL \checkmark

only 11-strings
available

Finite language

RL \checkmark



Language (L)

L is finite

\Downarrow ①

FA

\Downarrow

RL

L is infinite

single alphabet

\Downarrow

AP-Series ③

\Downarrow

FA

\Downarrow

RL

$a^n/n \geq 1$

②

Non-AP

\Downarrow

~~FA~~

\Downarrow

N.R.L

$a^{n^2}/n \geq 1$
 $a^{2^n}/n \geq 1$

more than 1-alphabet

④ Comparison
1 here

\Downarrow

~~FA~~

N.R.L

$a^n b^n$
 $n \geq 0$

⑤ no-comp

\Downarrow

FA

\Downarrow

R.L

$(a^m b^n)_{m,n \geq 0}$