



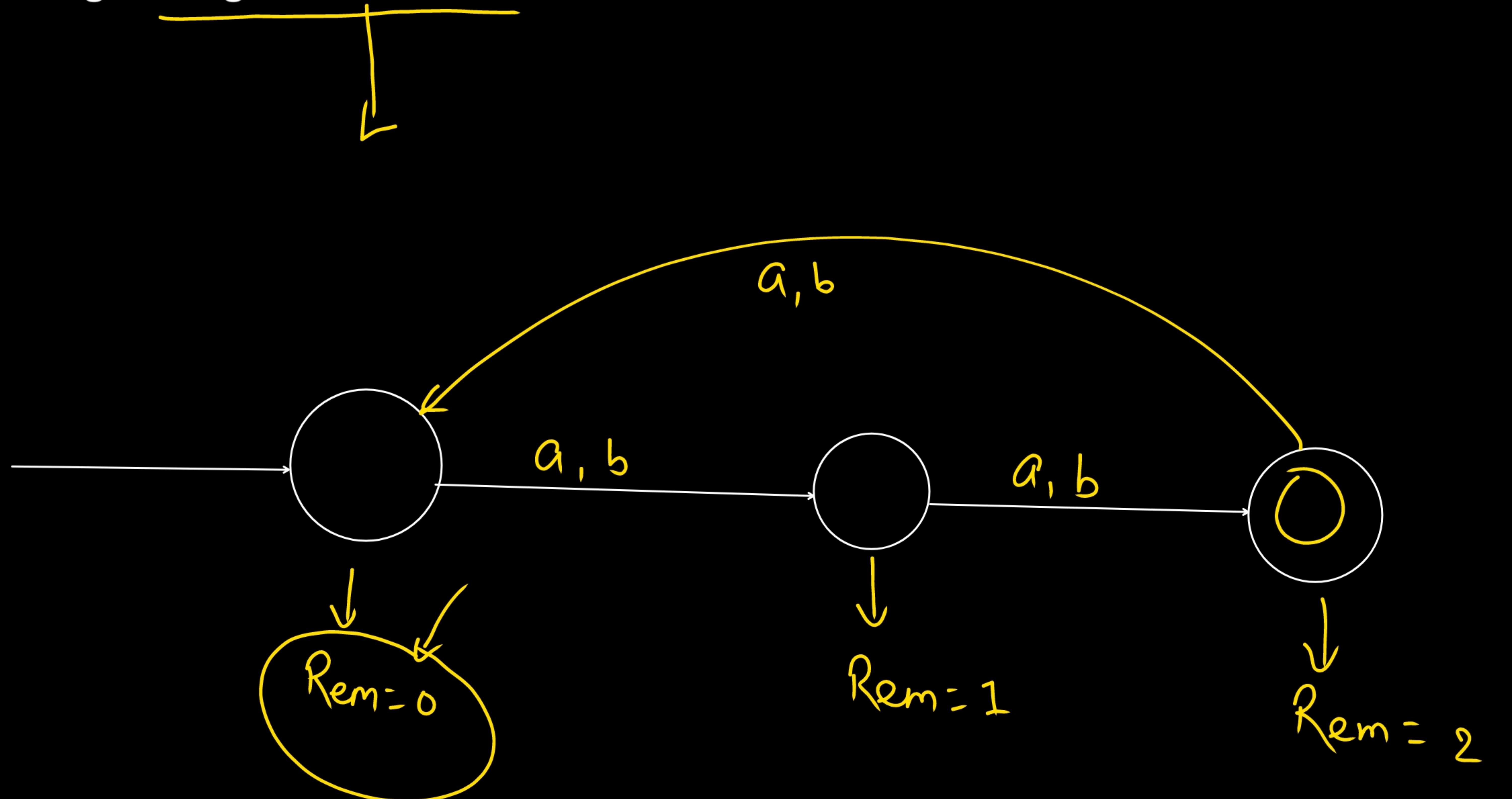
# Theory of Computation

**Basics/DFA**

**Lecture 4**

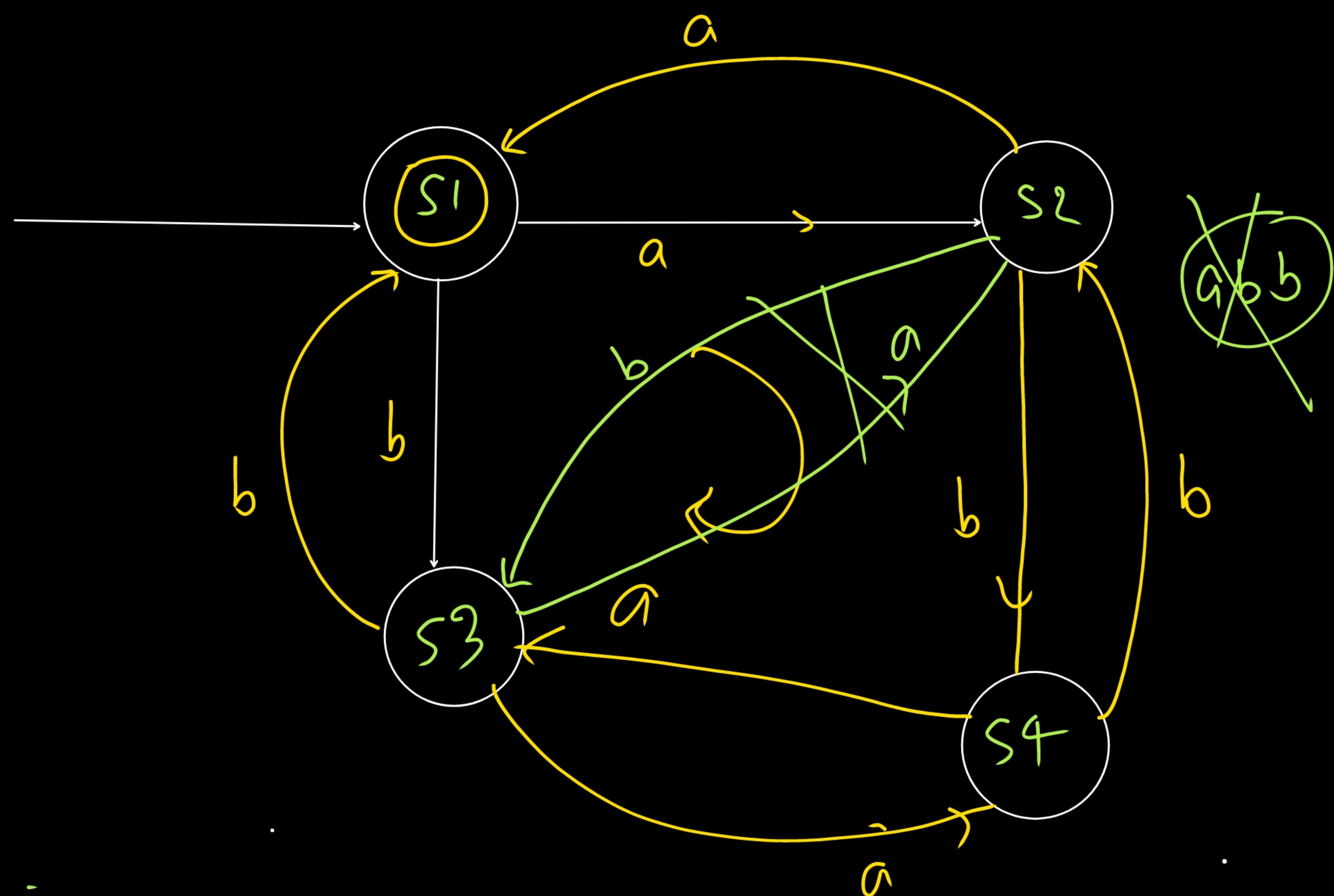
**Gaurav Raj**

16. Construct minimal Finite Automata that accepts all strings of a's and b's, where the length of the String is congruent 2 mod 3.



17. Construct minimal Finite Automata that accepts all strings of a's and b's, where the length of the String is congruent 3 mod 5.

18. Construct minimal Finite Automata that accepts all strings of a's and b's, where the length of the no of a's and no of b's are divisible by 2.

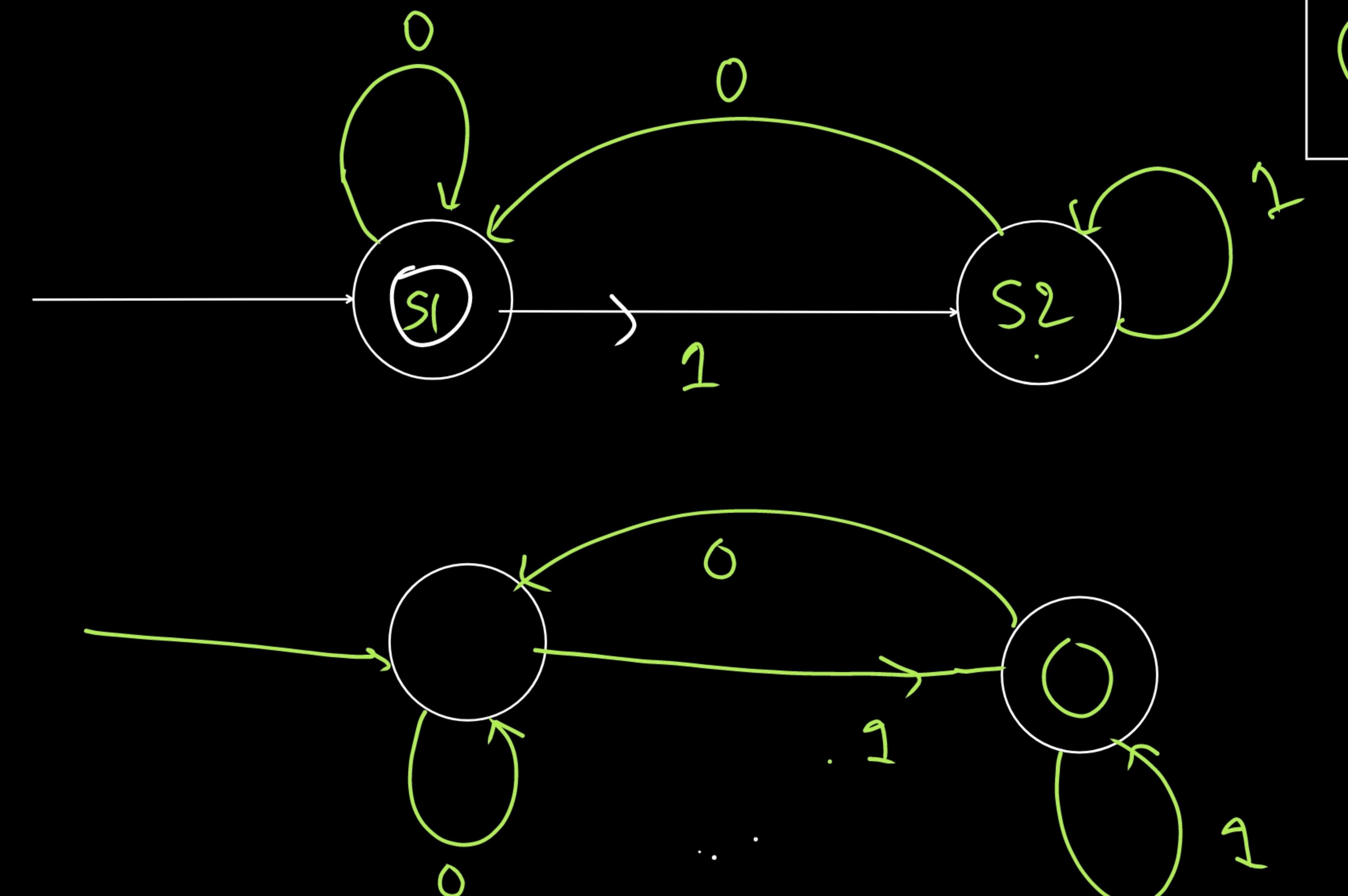


$$L = \left\{ \overline{aa}, \overline{bb}, \overline{aab}, \overline{bab}, \dots \right\}$$

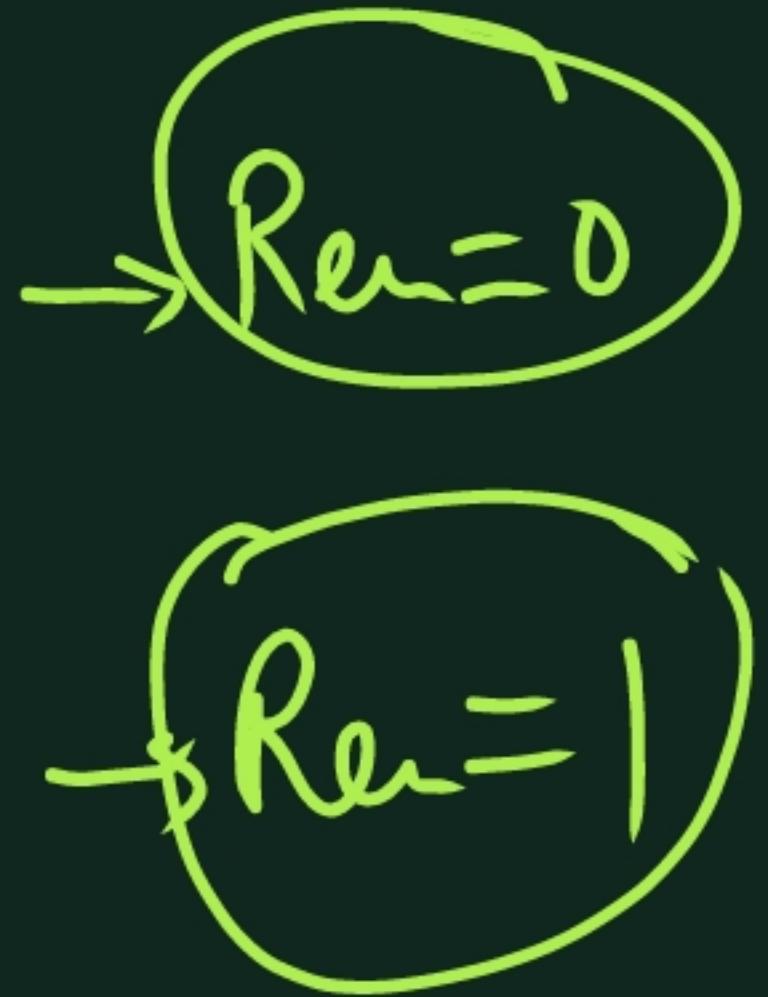
abab

19. Construct minimal Finite Automata that accepts all strings of 0's and 1's, which accepts all binary numbers which are divisible by 2.

$0 \rightarrow$	0 0 0	0
$1 \rightarrow$	0 0 0	1
$2 \rightarrow$	0 0 1	0
$3 \rightarrow$	0 0 1	1
$4 \rightarrow$	0 1 0	0
.	.	.
.	.	.
$14 \rightarrow$	1 1 1	0
$15 \rightarrow$	1 1 1	1



0	1
S1	S2
S2	S1

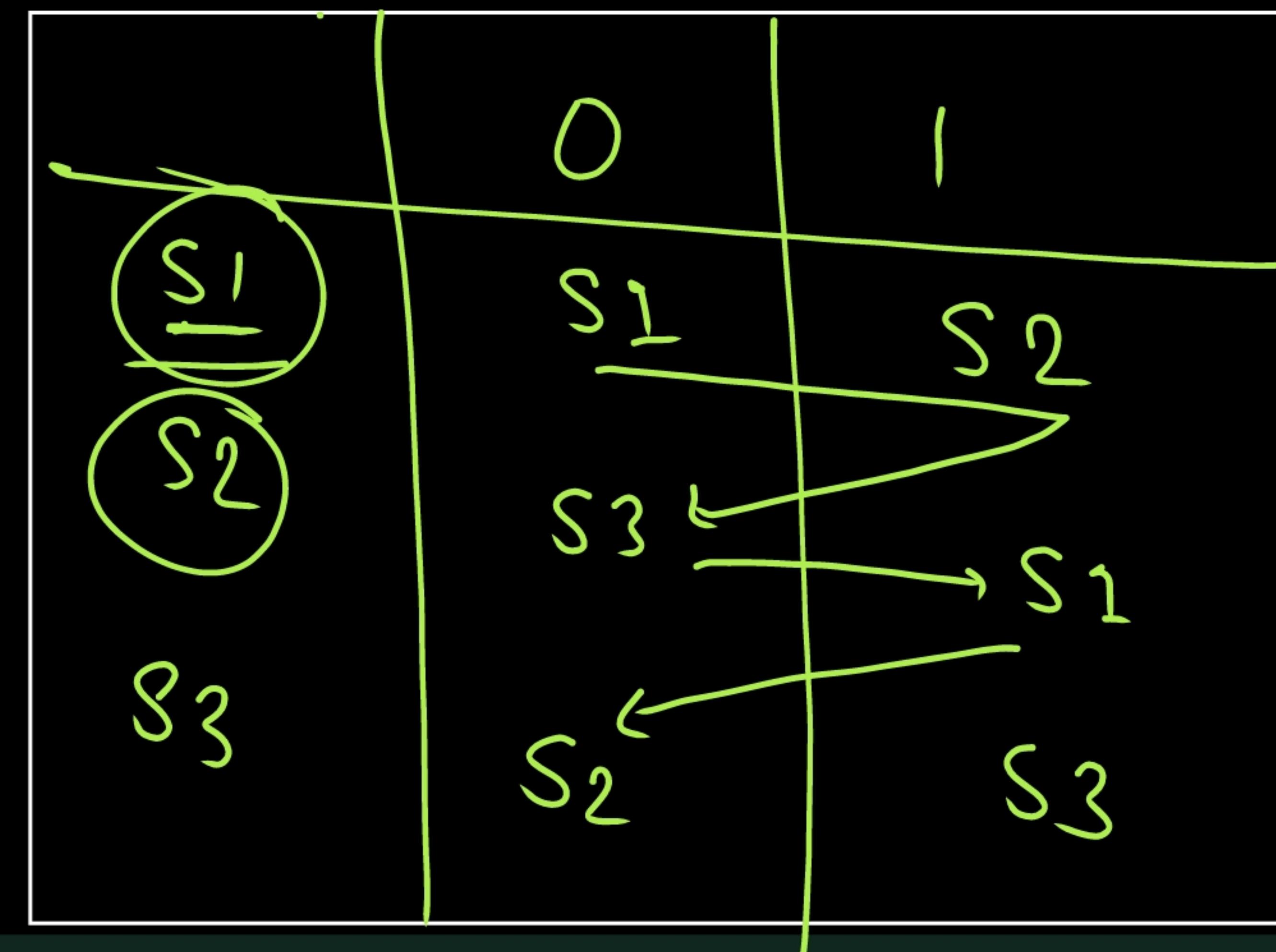
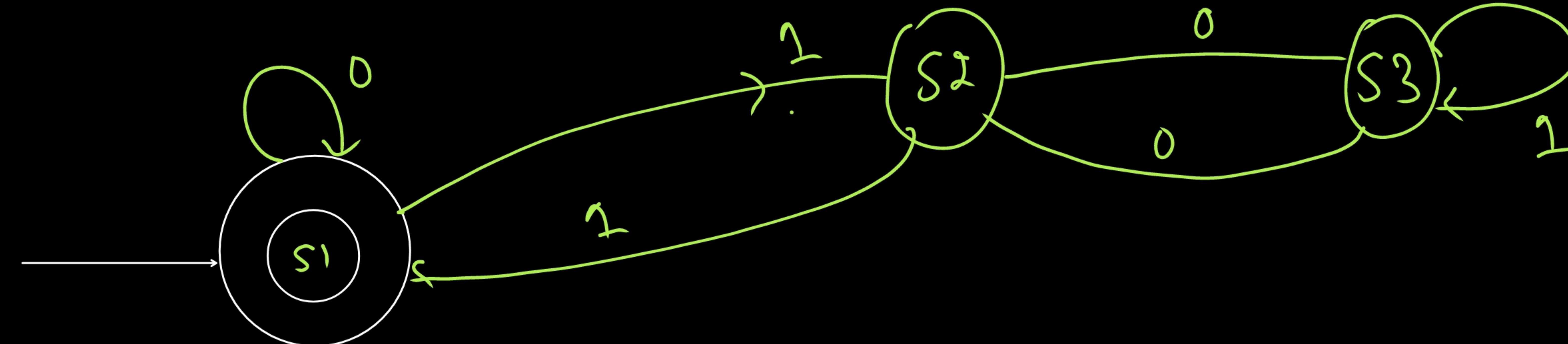


→ Even

→ Odd

20. Construct minimal Finite Automata that accepts all strings of 0's and 1's, where each string divisible by 3.

$\begin{array}{l} \underline{0\ 0\ 0} \\ \underline{0\ 0\ 1} \\ \underline{0\ 1\ 0} \\ \underline{0\ 1\ 1} \end{array}$	$\begin{array}{l} 0 \\ 1 \\ 2 \\ 3 \end{array}$
$L : \{ \_ \_ \_ \}$	$\downarrow$ F.A



$$R = 0$$

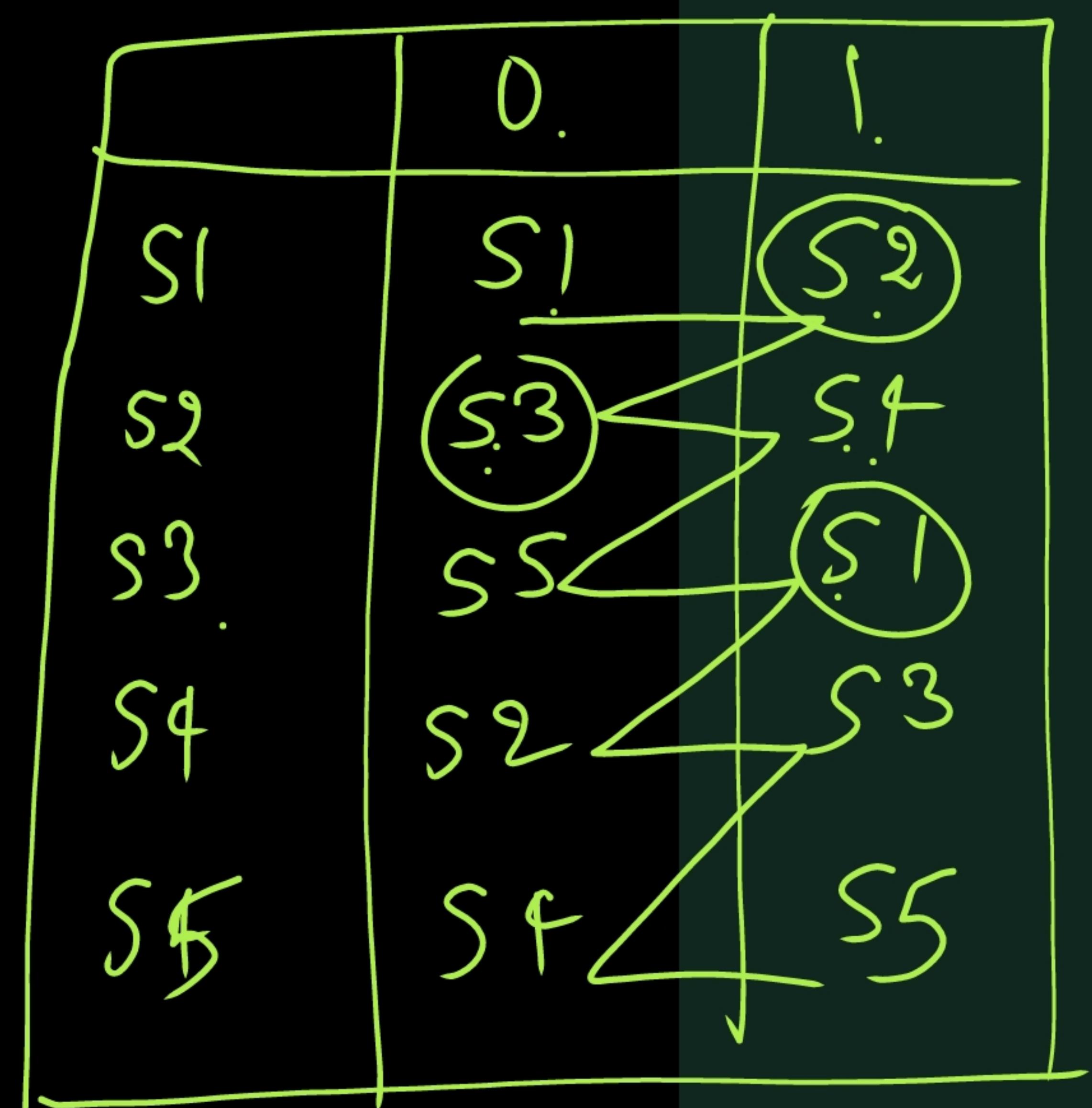
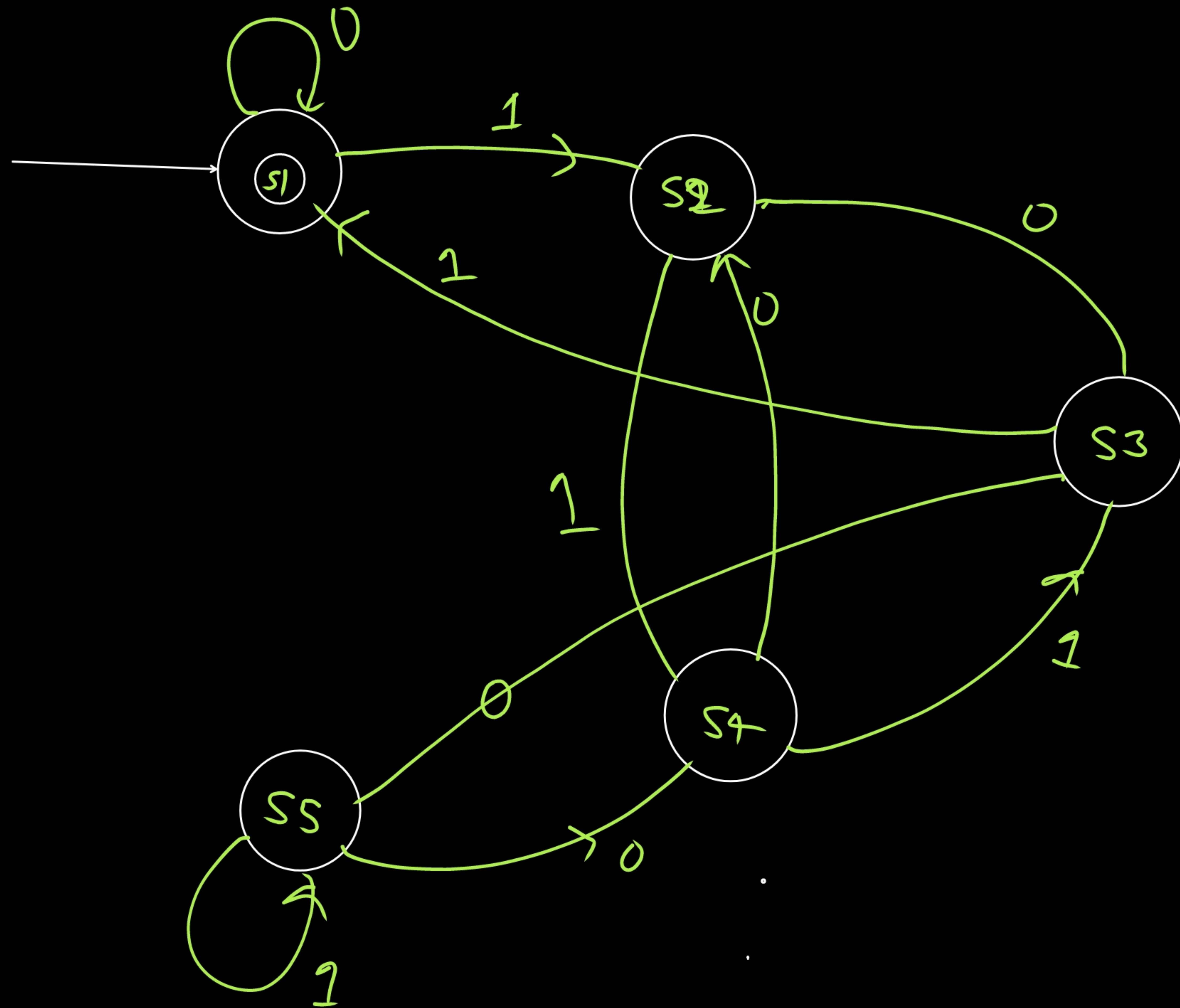
$$R = 1$$

$$R = 2$$



21. Construct minimal Finite Automata that accepts all strings of 0's and 1's, where each string divisible by 5.

$0000 \rightarrow 0$
$0001 \rightarrow 1$
$0010 \rightarrow 2$
$0011 \rightarrow 3$
$0100 \rightarrow 4$
$0101 \rightarrow 0$
$\downarrow$
F.A



21. Construct minimal Finite Automata that accepts all strings of 0's and 1's, where each string divisible by 7 and starts with 1.

22. Construct minimal Finite Automata that accepts all strings of a's and b's, where first and last symbols are different.

23. Construct minimal Finite Automata that accepts all strings of a's and b's, where first and last symbols are same.

24. Construct minimal Finite Automata for the language  $L = \{ a^m b^n \mid m, n \geq 1 \}$ .



Thank You

