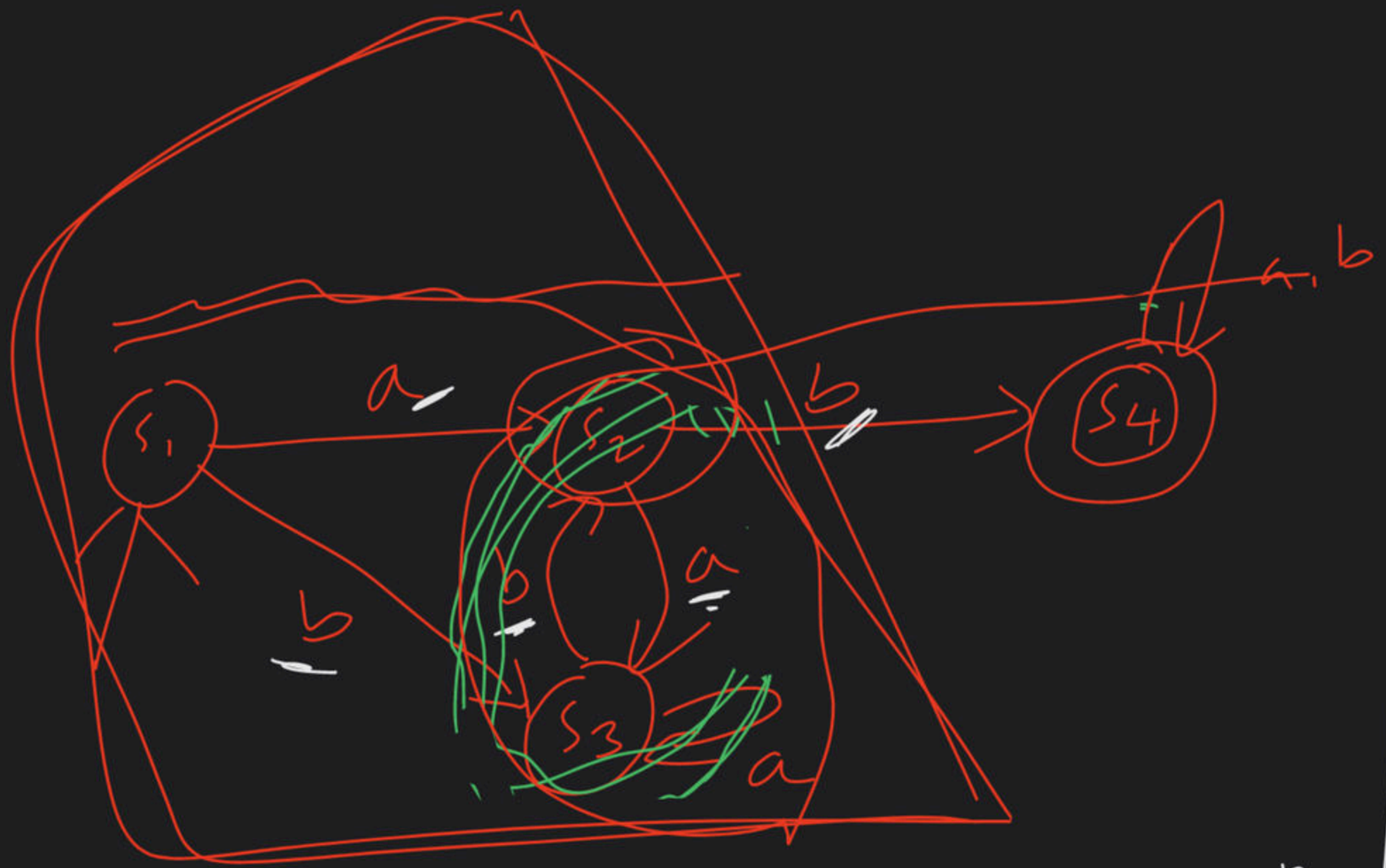
CFG and PDA - I

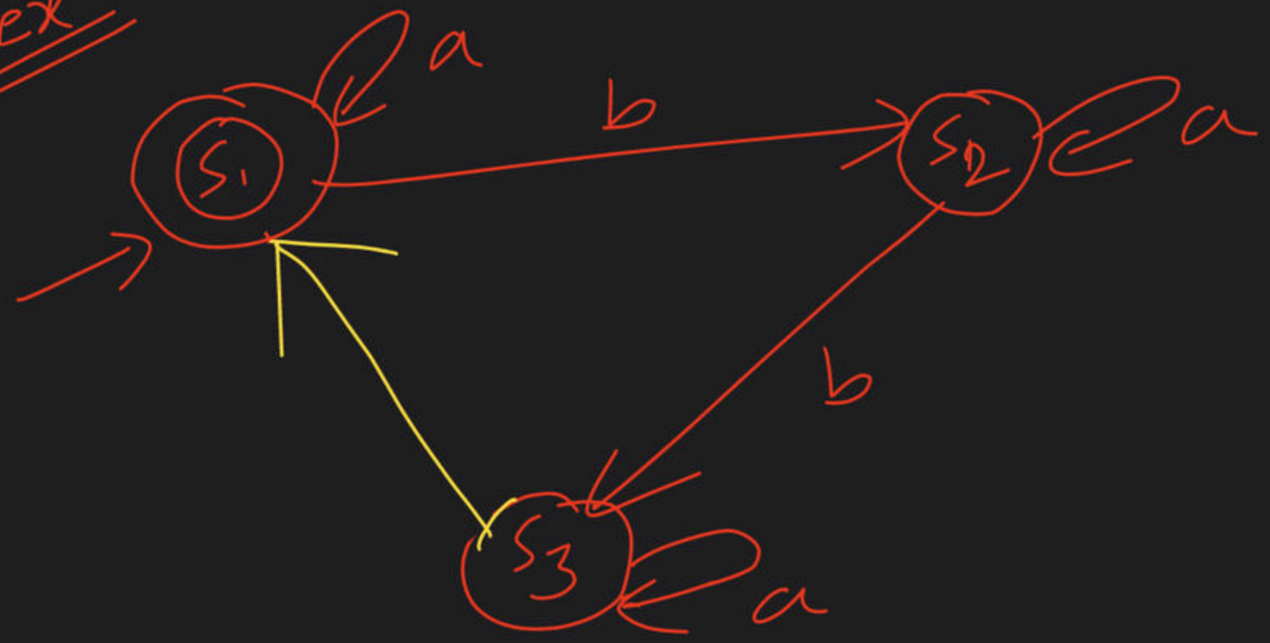
Complete Course on Theory of Computation

Subbarao Lingamgunta • Lesson 23 • Mar 4, 2022



$$(a + ba^*b)(aa^*b)^{**}\, b\,(a+b)^* \;\Big|\; \Big[(b + aa)(a + ba)\, bb(a)^* + ab\,(a+b)^*\Big]$$

ex

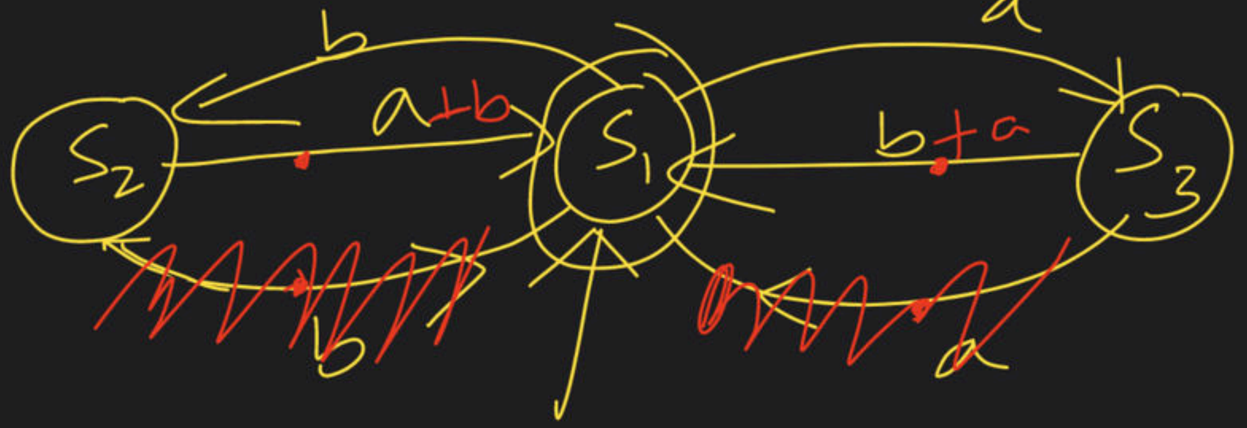


$\Rightarrow$

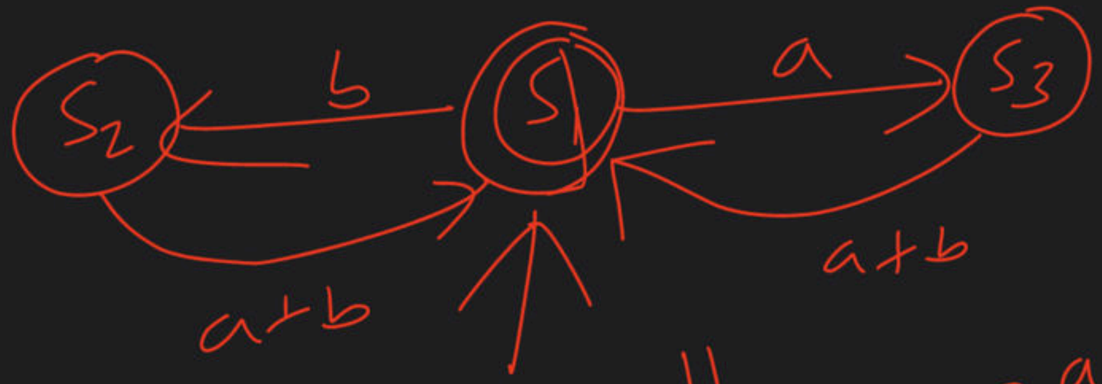
$\Longrightarrow (a + ba^*ba^*b)^*$

$(a^* b^*)^*$

$(a^* b)^*$



$2 \cdot \underline{S} + \underline{S} \cdot 2 \Rightarrow S(2,2)$



$\underline{a.b} + \underline{b.a.b}$

$\Downarrow$

$a(a+b)$

$b(a+b)$

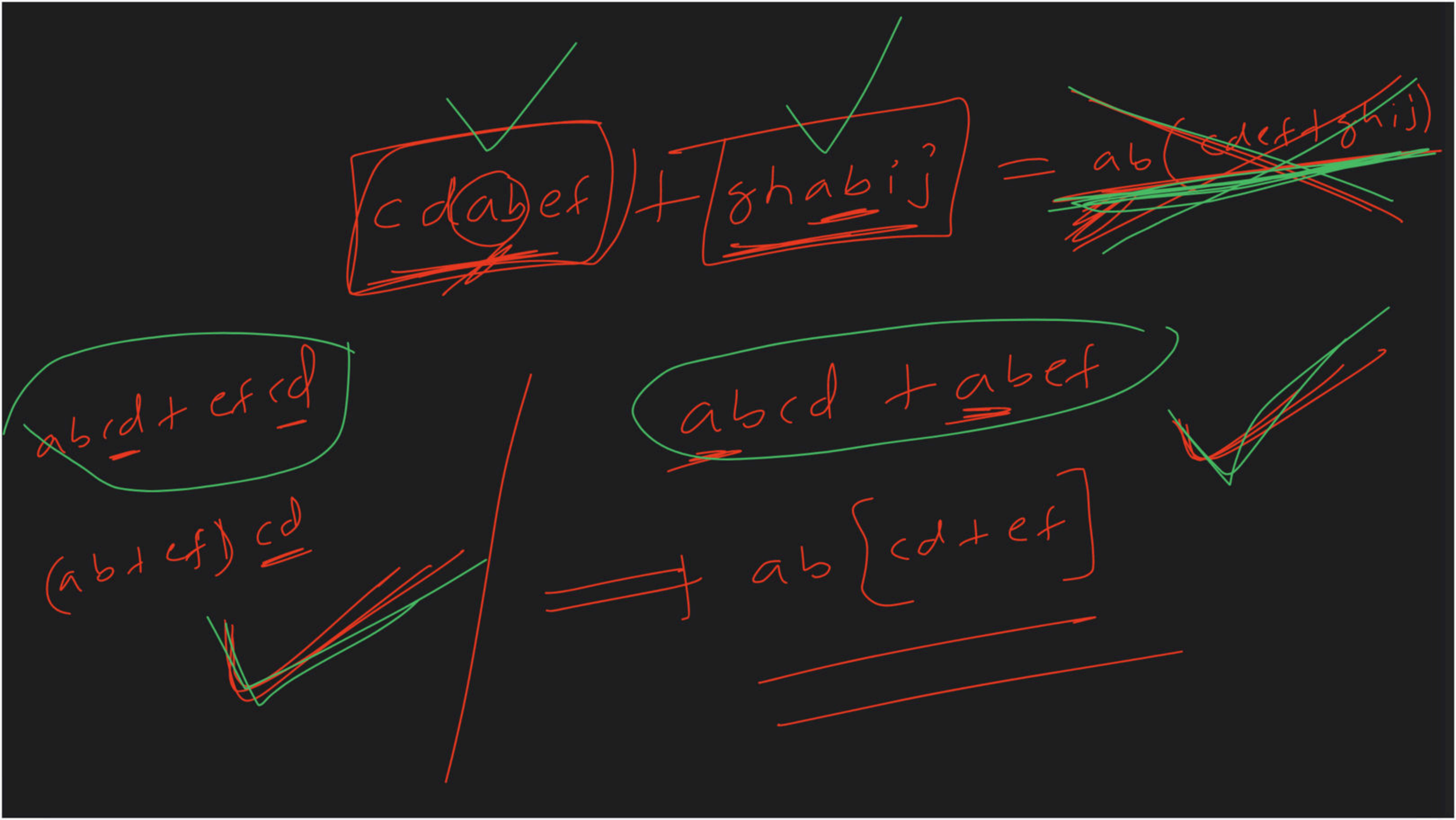
$\Rightarrow \left(a(a+b) + b(a+b)\right)^*$

$\Rightarrow \left[(a+b)(a+b)\right]^*$

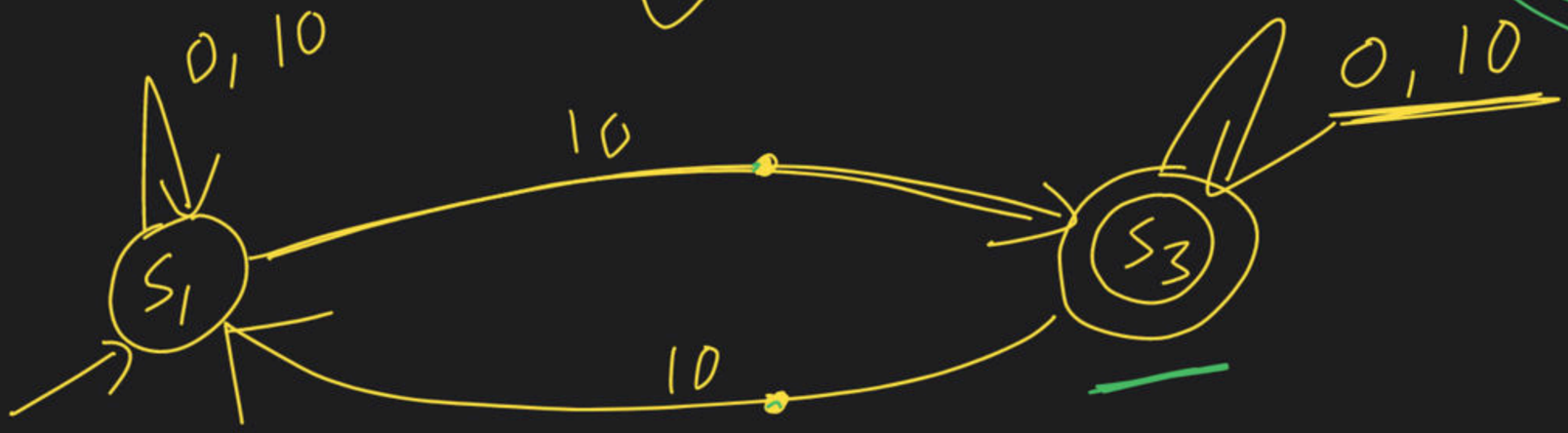
$\Rightarrow \left[(a+b)^2\right]^*$

Set of all even length strings

$\rightarrow$ 6, 4, 2, 0 $\Rightarrow$


cd(ab)ef + ghabij = ab(cdef + ghij)
abcd + efcd
(ab + ef) cd
abcd + abef
= ab [cd + ef]

$\Rightarrow$ 10, 00000 10, 1000



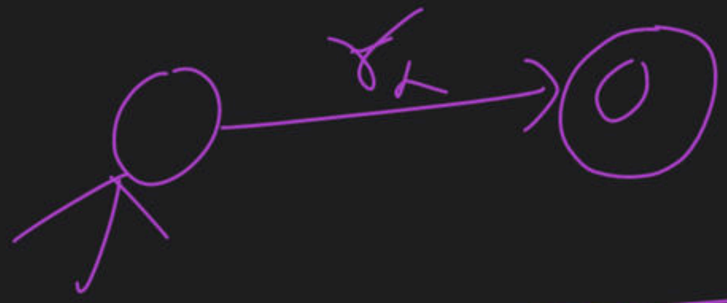
$\Downarrow$

$$[0 + 10 + 10(0+10)^{*}10]^{*} 10 (0+10)^{*} \Rightarrow$$

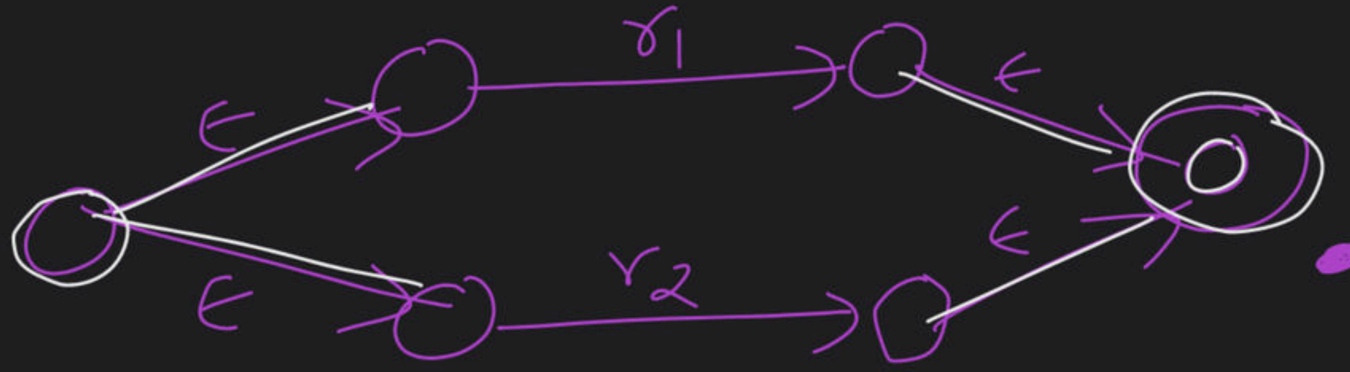
Regular Expression to FA

r_1

r_2

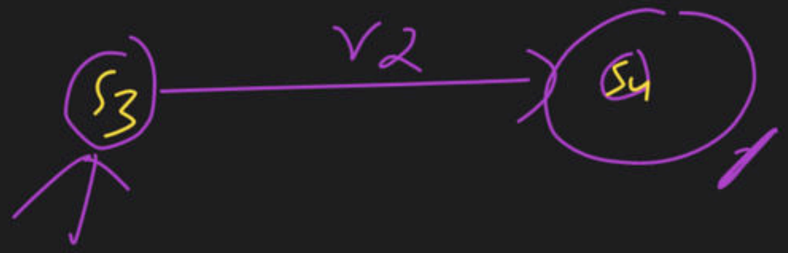


$r_1 + r_2$

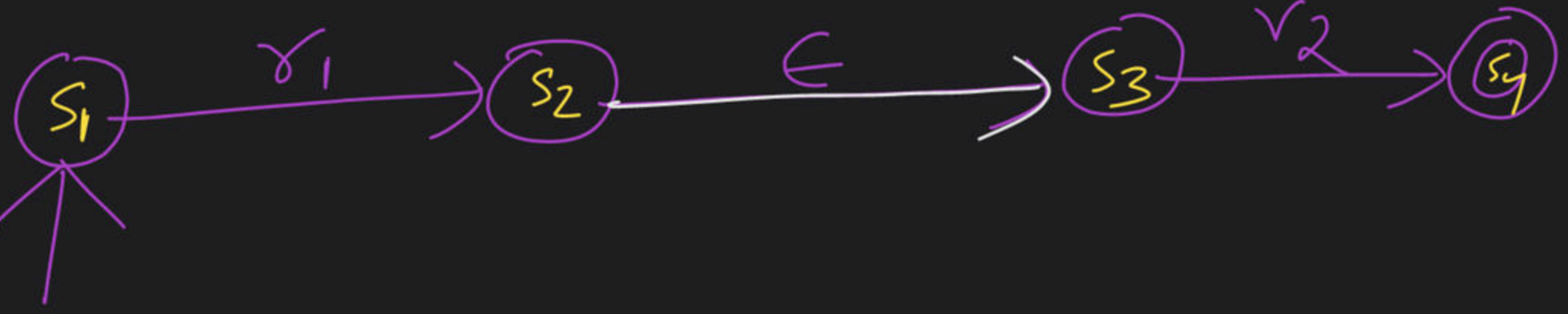


r_1

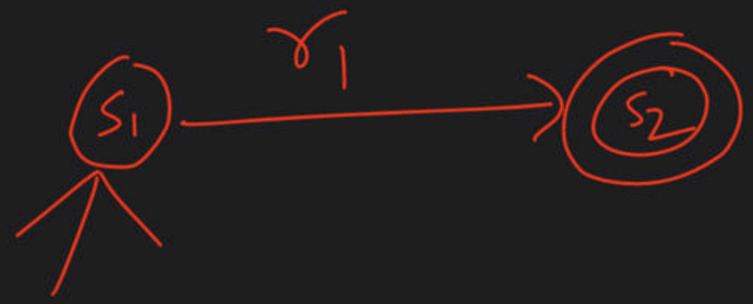
r_2



$r_1 \cdot r_2$



r_1



$r_1 = a$

$r_1 =$ a+b

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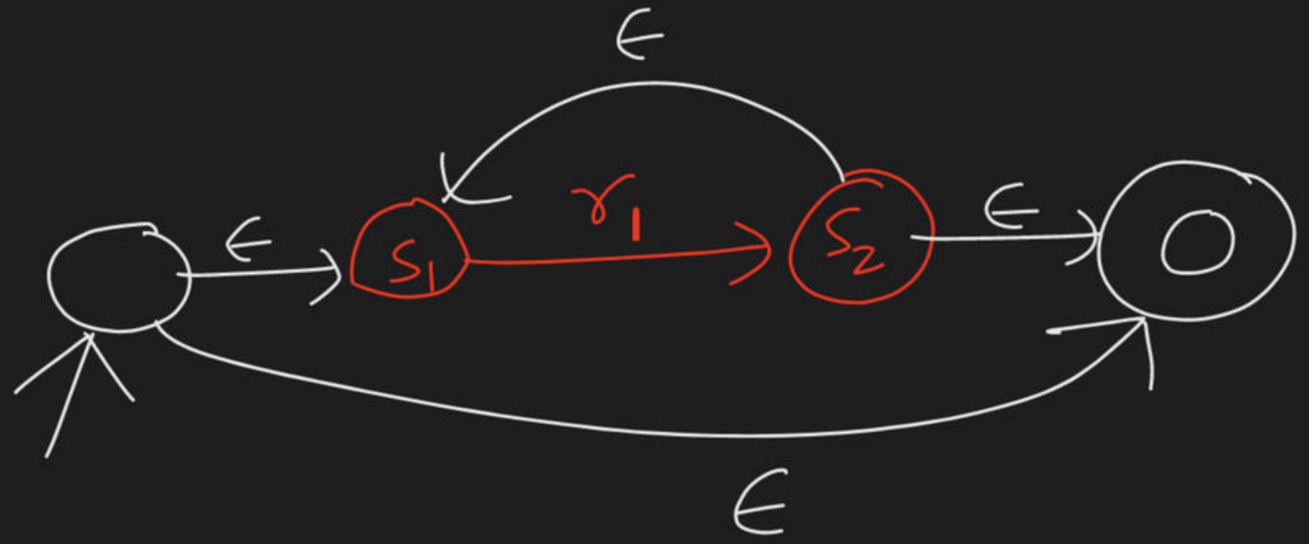
a

r_1

$\Downarrow$

$\Longrightarrow$



$\epsilon, r_1, r_1 r_1, r_1 r_1 r_1$

$r_1 r_1 r_1 \cdots\cdots$

$S_i r r r r r r$

$S_i r^+$