CS & IT ENGINEERING



Theory of Computation

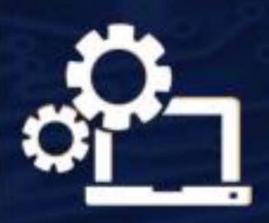
Finite Automata:

Regular Grammar & Pumping Lemma

Lecture No. 14



Mallesham Devasane Sir



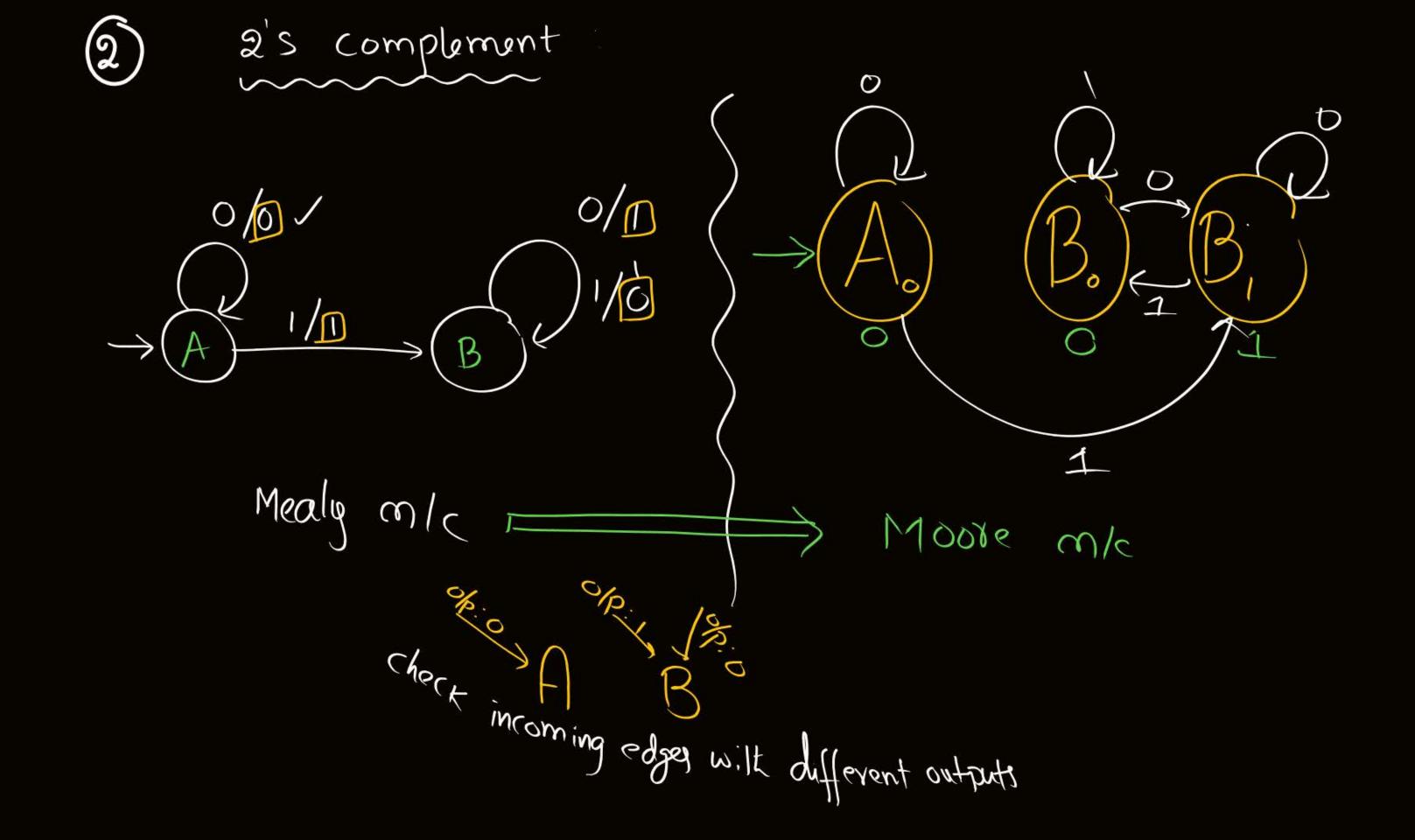
1) FA WILK %

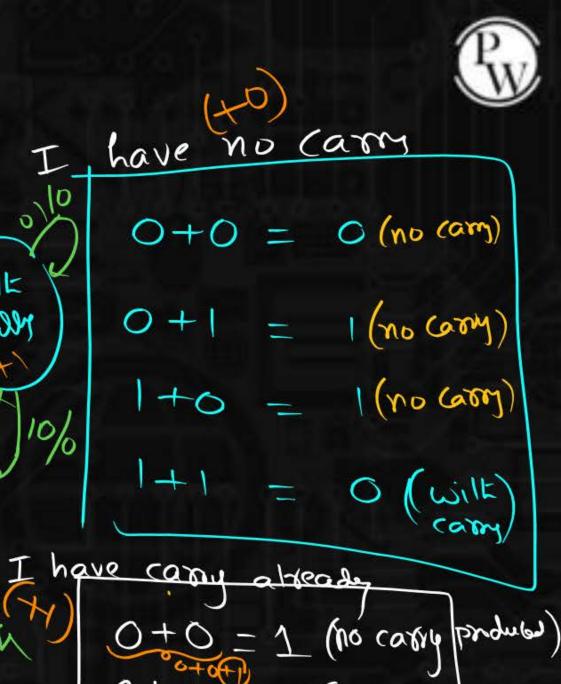
2 RG

3 P.L.



TOPICS TO BE COVERED





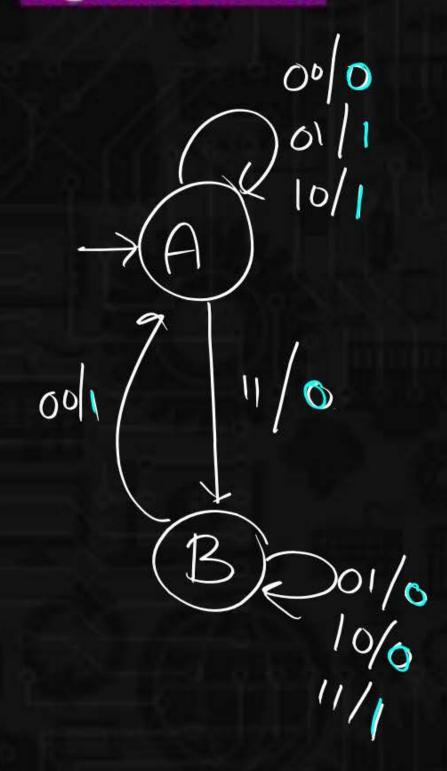


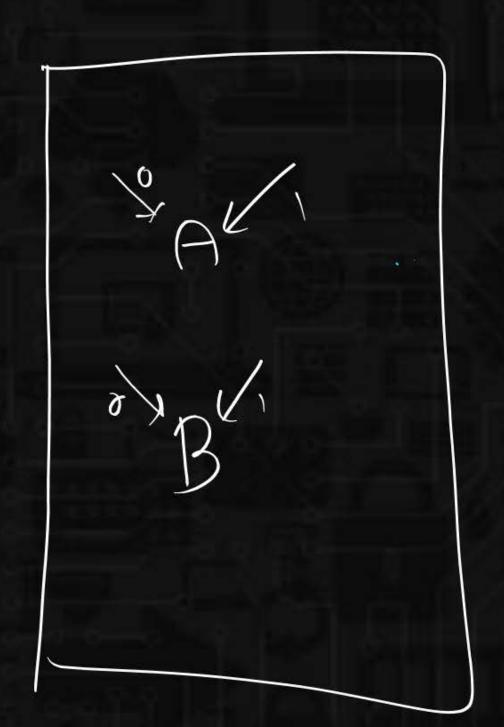
1=100010101 - 001001011 - 000001010 - 000001000 - 000001000 - 000001000 - 000001000 - 000001000 - 0000001001

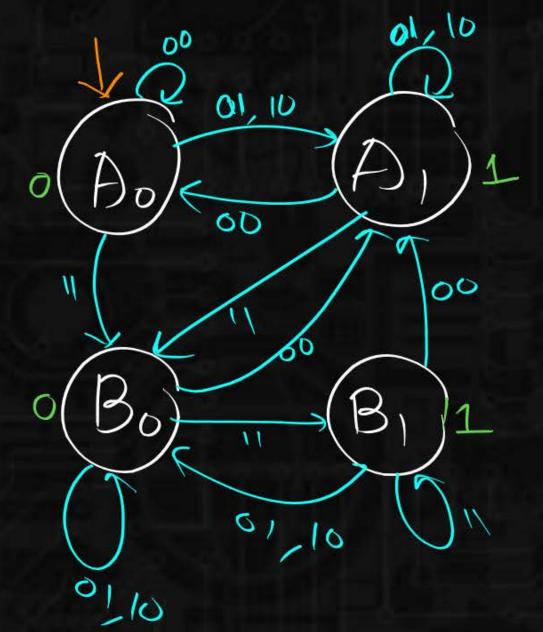
T-A

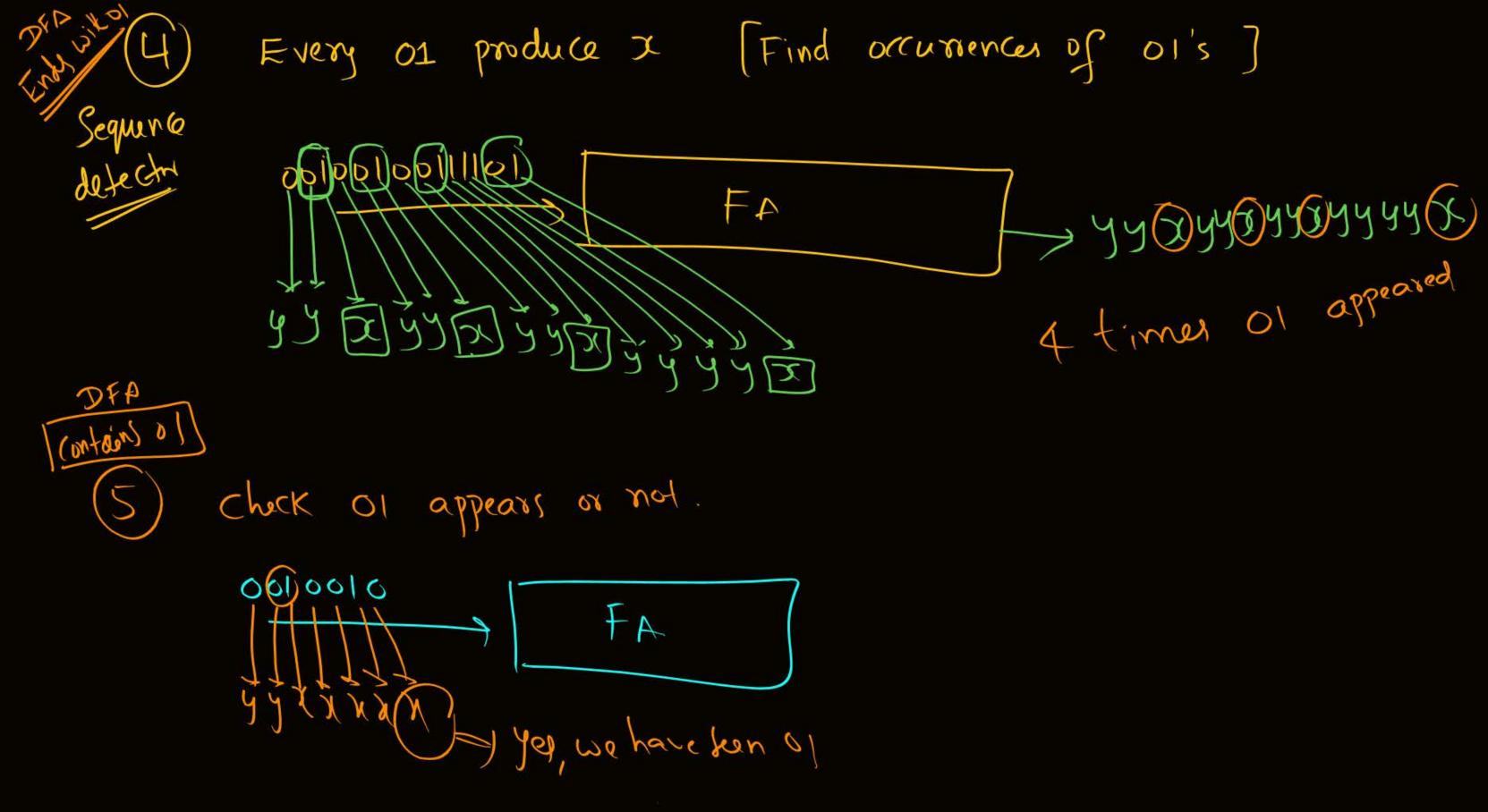
10/100000

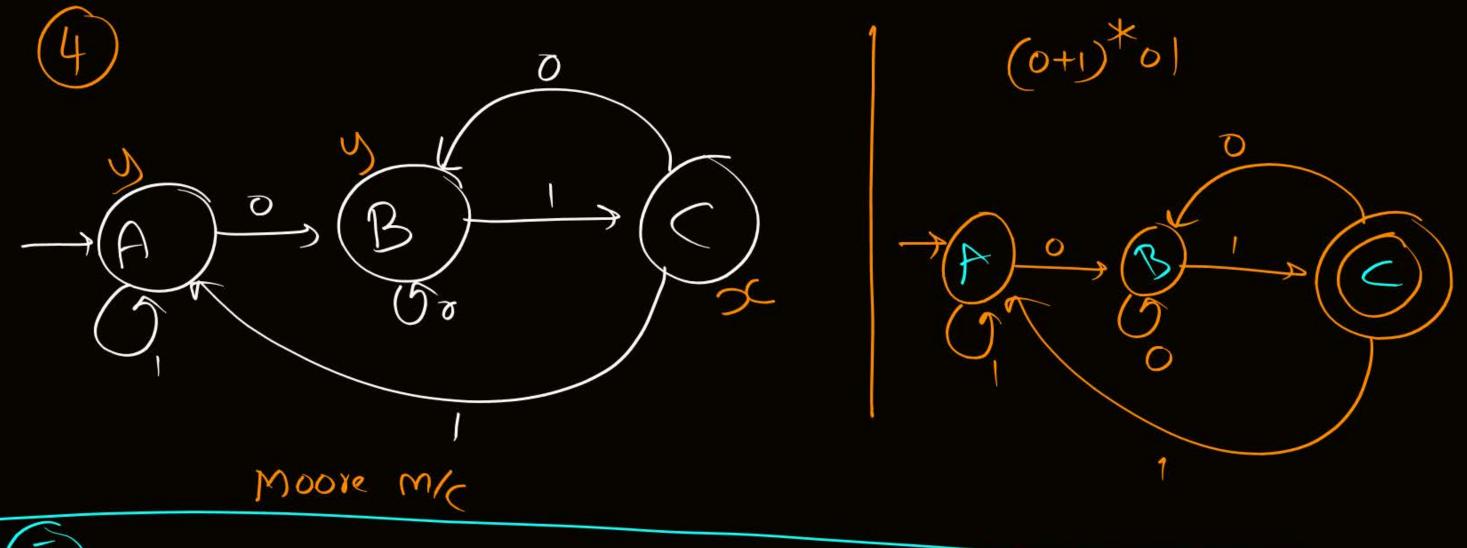
0+0=1 (no carry pro 0+1=0 (carry) 1+0=0 (carry) 1+1=1 (carry)

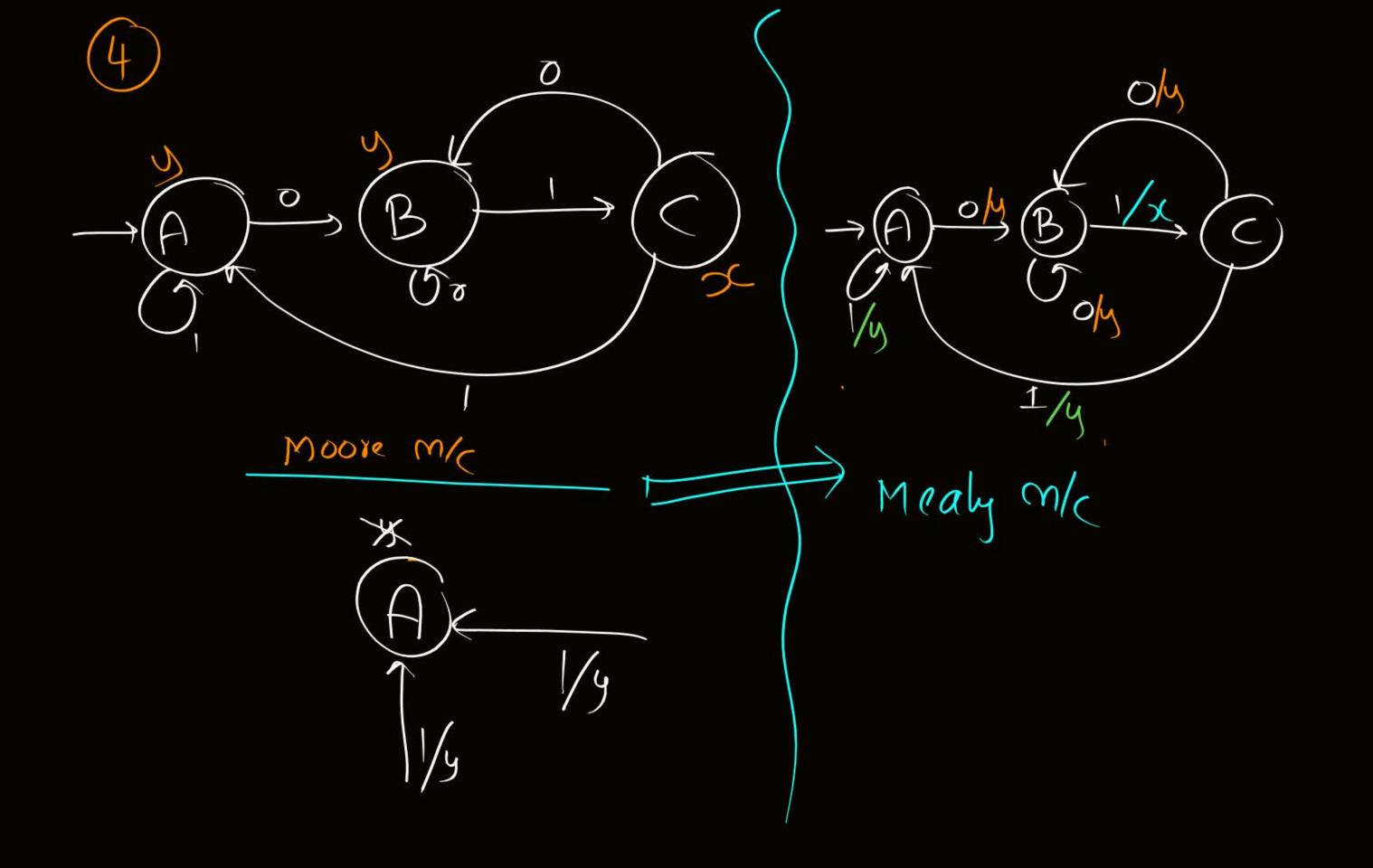






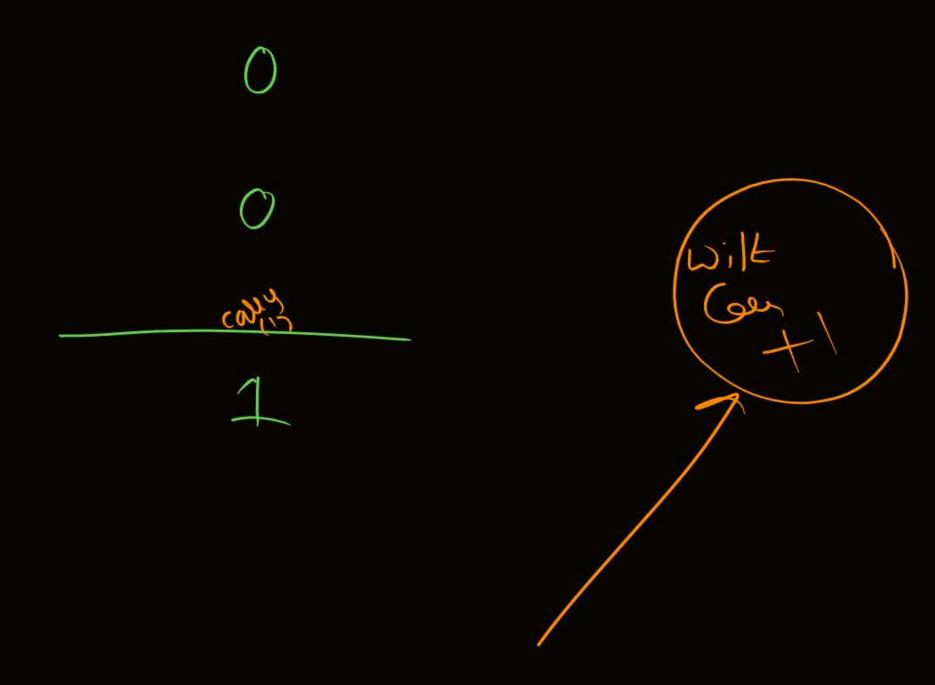






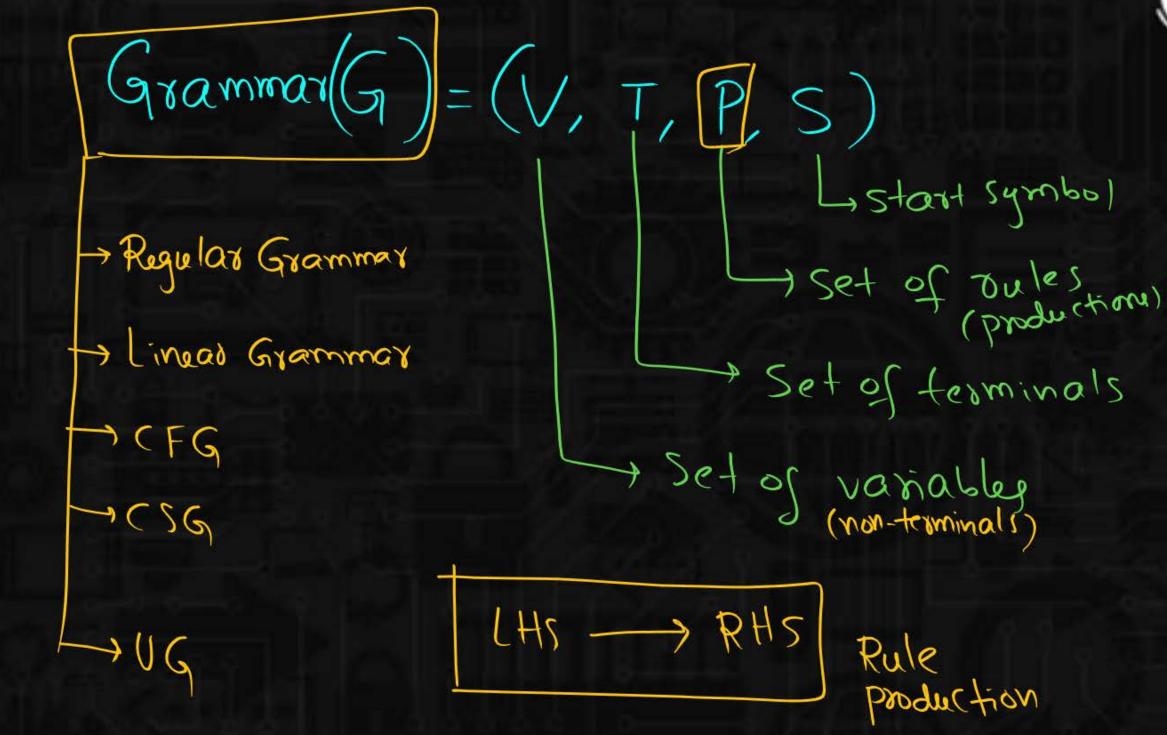
Mealy M/c Divides Moder M/c South stake into muttiple states by looking at o/s at incoming edges by looking at o/s at incoming edges copy of g stake to its incoming transitions

Mealy m/c ~ Mouse m/c



Subtraction of 2 binary numbers Increment of binary inpul-00 Revert it. 0/1 0000 Same 000011000 Decrement of binary input Reverse 00110000 actus 1/p





Regular Grammar: It is LLG DX RLG

(Lest Linear) (Right Linear)



if variable appears, exactly one variable [est most (E.424) trample:

Example:



Rel Sam YO (UYTIM Right bec

S-AA
ABOUGATE
NO LEGIT YELL
NO

S-Salb LLG Lestrec $S \longrightarrow Aa Bb Ca$ $V = \{S, A, B, C\}$ A -> f B-> B9 T = da, b, d, f, 2, e} $C \rightarrow e$

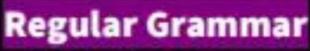
Regular Grammar Identify LLG, RLG It is llq

It is ILG
It is not PLG

Visture in bolt
this there in

VTV S-B





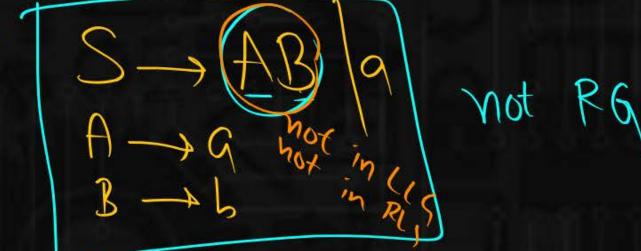


















HIT is not LLG LIT is not PLG LIT is not PG





$$S \rightarrow a$$

$$S \rightarrow \varepsilon$$

$$L = \{e\}$$

$$S \rightarrow \alpha$$
 (3)

$$S \rightarrow 0/8$$

$$S \rightarrow \alpha | \epsilon | L = \{ \epsilon, \alpha \}$$



 $S \rightarrow S$

L = { } = \$



$$S \rightarrow S_{\alpha}$$

$$(6) S \rightarrow \alpha S$$



S-> Aa Bh

L= { }= ¢



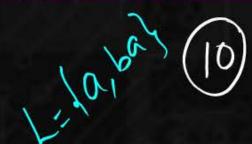
S-> Sa Aa

= { }= 9



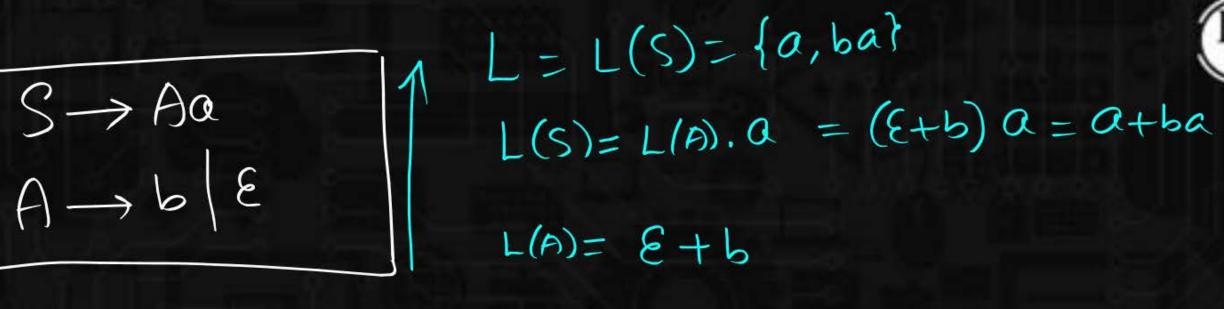
S - a / Seles

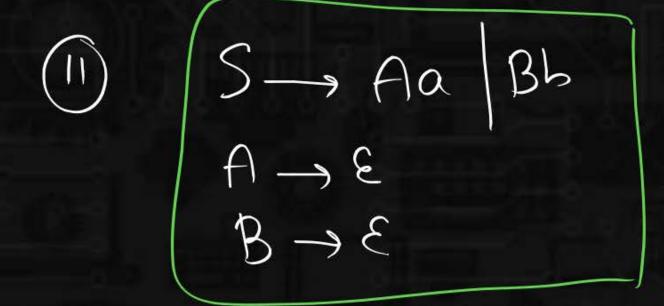
L= das



$$S \rightarrow Aa$$

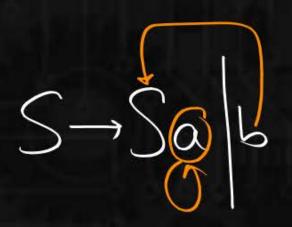
$$A \rightarrow b \mid \epsilon$$



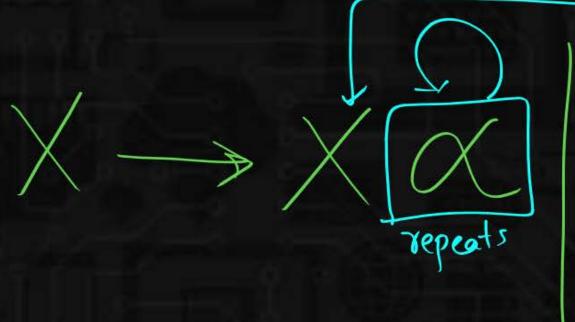


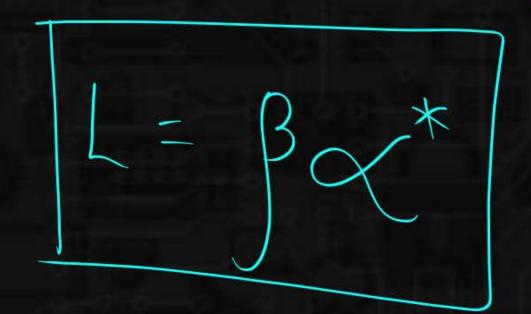
$$L = \{a, b\}$$

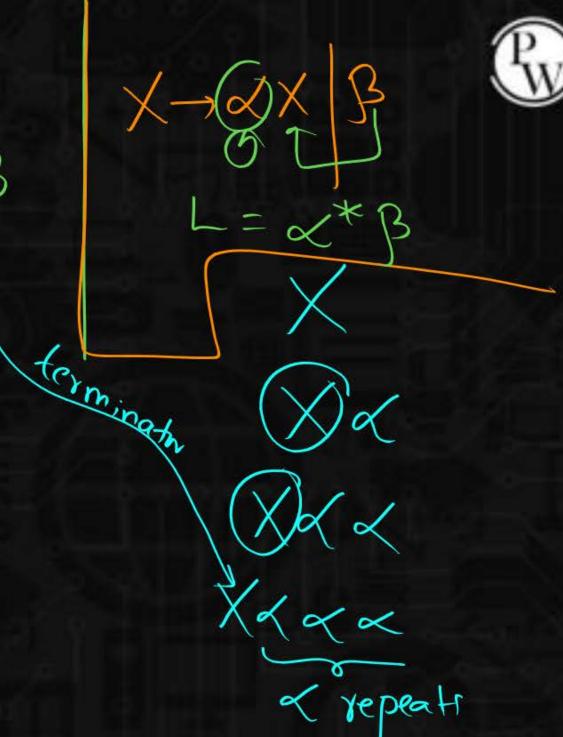
$$= \{a, b\}$$



$$=$$
 ba







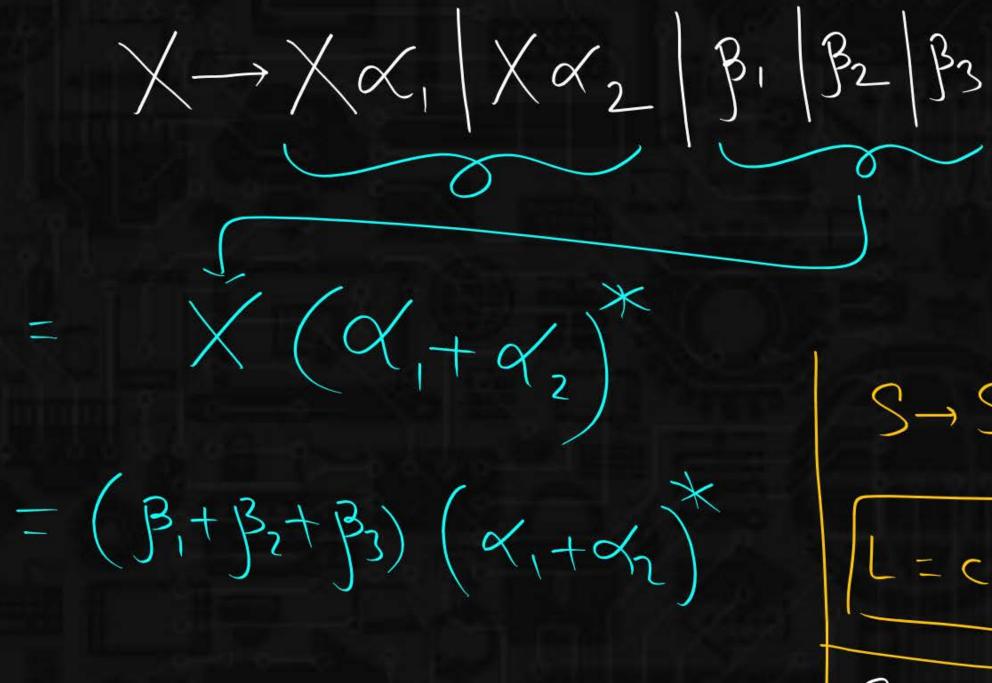
$$(7) S \longrightarrow SQ / A \longrightarrow L - ab$$





$$(8)$$
 $S \rightarrow a S | E$

$$(22)$$
 $S \rightarrow ab S | E$





$$\frac{1}{(a^{2})} \frac{1}{(a^{2})} \frac{1}{(a^{2})}$$

$$L = (a+b)^*S$$
= $(a+b)^*E = (a+b)^*$

$$L = (a+b)^*(a+b) = (a+b)'$$

Regular Grammar S-> Sab | Sca | e S -> Saa E L-(aa) (31) $L = 000 \times 32$ $= 600 \times 32$ S- Saa a L=60(33) $S \rightarrow Sa/A$ $A \rightarrow Ab/E$

Pw

(34) S-, aS/A A-, bA/E

W Starts wilk a and b no string in the world only stats with a

Summary

FA wilk ofp

Regular Grammer
Ly few problems who

P.L. wext server





