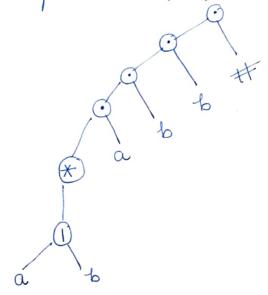
Ques- Conversion from Regular Expression to DFA without NFA.

Regular Expression -> (a/b)*abb

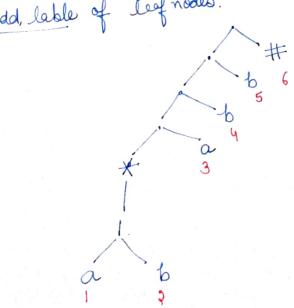
Convert regular expression (a/b) *abb to DFA without NFA.

firstly, we add ## at the end of the regular expression. Agemented RE 7 (a/b) * abb #

Step-1 Construct Syntaso tree of Regular expression (a16) * tabbt.



Add, lable of leef nodes.



Find nullable node from sentan tree. nullable node 6 Step-3 · Calculate first pos. 21,233 853b 81,233 ह्यु b \$1,2,33 81233, 843 833 a 21,23 इड्रिक्टिड) 81233 . 843 81,23 81,233 - 831 हु अरे अ §23-6 813 X 8133 513 · calculate last pas. 213-6 223 हार्र वहार

Step-4 Calculate follow pas from construct Syntan Iree. > for find follow pas we allow y take (+x) only. followpas position , start from top. 3,1,2 3,1,2 E123] G [5] [6] C2 [6] 6 so, find all (+x) followpas of the syntano tree. E1733 (553) [1] # [4] हारुश्ने स्थ , ह्यं केह्यं हार्यो हार हिंदित E1,25 (\$) \$13 - E15 3835 21,25 / 21,23 हार वहार हरने हरन Now, construct DFAlyuring Syntan tree and followpas table. whalways start from top. Initial state = firstpas of root = \$1,2,34 --- (A) A = & 1, 2,3] State A. 1- Transition S(A, 9) & S(A, b) S(A,a) = fallowpas(1) U fallowpas(3) \$1,233 U \$43 (3) = £1,23,43 - (B)

$$S(A,b) = \text{followpoo}(3)$$

$$= \S[2,3] - --A$$
State B: - Dansition $S(B,a) + S(B,b)$

$$S(B,a) = \text{followpoo}(1) \cup \text{followpoo}(3)$$

$$= (12,3) \cup (4)$$

$$= \S[2,3,4] - --B$$

$$S(B,b) = \text{followpoo}(2) \cup \text{followpoo}(4)$$

$$= \S[2,3,4] \cup \S[3]$$

$$= \S[2,3,5] - --C$$
State C: $C = \S[2,3,5]$ Dansilion $S(C,a) \in S(C,b)$

$$\Rightarrow S(C,a) = \text{followpoo}(1) \cup \text{followpoo}(3)$$

$$= (12,3) \cup (4)$$

$$= (12,34) - B$$

$$S(C,b) = \text{followpoo}(2) \cup \text{followpoo}(5)$$

$$= (12,3) \cup (6)$$

$$= (12,3,6) - --D$$
State $B = D = \S[2,3,6]$ Dansilion $S(D,a) \in S(D,b)$

$$\Rightarrow S(S,a) = \text{followpoo}(1) \cup \text{followpoo}(3)$$

$$= (12,3,4) - B$$

$$S(S,b) = \text{followpoo}(1) \cup \text{followpoo}(3)$$

$$= (12,3,4) - B$$

$$S(S,b) = \text{followpoo}(1,2,3) - B$$

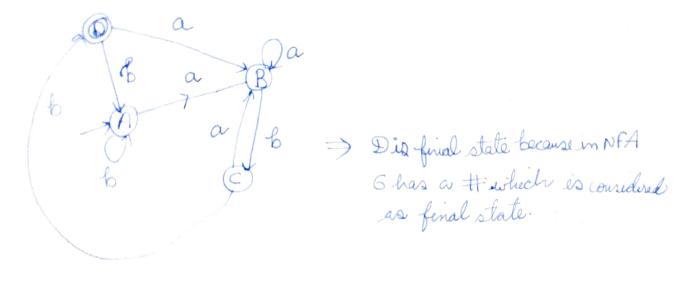
$$S(S,b) = \text{followpoo}(2,2)$$

$$= \text{followpoo}(2,3) - B$$

Transition - Lable

	April 10 mary		Lycan Biarrie Landing	
State	Input			
	a'	Ь		
A=(12,3)	B	A		
B=(1,2,3,4)	В	C		
C=(1,2,3,5)	В	D		
(9 = (1,2,3, <u>6</u>)	В	A		

· Diansition Digram (DFA)



Expression to DFA without NFA.

Regular Expression a* 6* a(a/b)*6*a. Answer Convert regular expression at 6*a(a/6)*6*a to DFA without Firstly, we add # at the end of the regular expression. Step I construct syntax tree of regular expression at b*a(a/b) b*a#
and also give level of each leaf nocle. Sty-2 find nullable nodes from constructed septase tree.

Step-3 Calculate firstows and last pas from constructed syntax tree. 5/233 . 883 indiat () rullable rode 584 283 E1,233 .534543 873 a 273 E33 0 54,53 / E4,53 827 (E27 E43 a E43 6 E53 6 E53 £13 ca £13 £27 6 £23 ister-4 calculate followpas from constructed Syntase tree -> followpas table will be construct (create) by cesing)

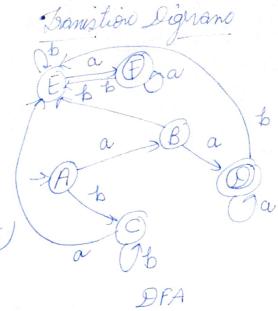
(. L X) only.

[123? を1233 · E734) E男井 を83 Dindirect (x) nullable £345,63, E73 a E73 noole. £ 1,231 (8345) & 63 (#) 863 £1233 £333 £453(X) £4,53 23 6263

position followpas	05(B,B)=followpoo(5)Vfollowpoo(6)
1 51,39	following (456,790)
2 52,39	= 254,5,6,73 U56,73
3 84,5,6,74	= £4,5,6,73E
4 84,5,6,73	
5 84,5,6,79	> State C= 22,33
56,73	Tronusition S(Ga) and S(GB)
7 884	os(c,0)= 84,5,6,7}=0
8	
Now, construct DPA by sesing	08((,a) - followpao(3)
Now, construct DPA by using construct sentent true and followpos table	= £4,5,6,73 E
clare from lop.	0S(C,-b) = followpoo(2)
Initial state \$1,2,33	= 233
State A = 5 1, 2, 33	
Transition S(A, a) and S(A, B) • S(A, a) = followers(1)(1)(1)(1)(1)(1)(2)	> State D=51,345,67,86
• $S(A, a) = followpas(1) () followpas(3)$	
= P 1, 31 0 9 9, 5, 6, 74	Transition S(D, a) and S(D, B)
= 2 1,3,4,5,6,73B	o S(D, a) = followpes(1) U followpes(3) U followpes(4) U followpes(4)
os(A.b) = Lollowpas(2)	followpas (4) () of the factorias (3)0
0 S(A, b) = followpas(2) = 52,33 C	1 1 1 1 1 1 1 1 1
	= 81,330 84,56,730845,6,730582 = 81,3456781
Istate B= 57,3,4,5,6,73	6797799785 D
Dousition S(B, a) and S(B, b)	OS(D, b) = fallowpas (5) U fallowyax(6)
o S(B, a) = followpax(I) Ufollowpax(3)	Jollowjer(6)
V followpes (4) V followpes (7)	= £4,5,6,7,0,7,
5/3/1/565/7/16/	= E4,5,6,73 E
586 1917 27796,460	> State F= \$ 4.5671
= 21,3,4,5,6,787 @	Drawition (E,a) L(E,6)
	0(2,4/2,6,6)

0

Dransition Jable



Final state are Dandf. because 8 is present in Dandf only. Queo Conswersion from Regular Expression to DFA without NFA.

Regular Expression a(a/b) * b We may convert a regular expression into a DPA (without creating) a NFA). firstly, we augment the given regular expression by concatenating it with a special symbol #. r-r(#). a(a/6)*6# Step-1 Convert regular expression a (a/b) \$6# and also give lablel for each leaf node. Step-2 find nullable node from constructed syntantice.

Step-3 Calculate firstpas and polastpas from constructed syntax thee. · {4} £5} 5 £5} E12,33 E43-B E43 22,33 1 82,33 राष्ट्र वराष्ट्र 223 a 223 £3376 £33 Syntax tree Step-4 Calculate followpos from constructed syntase tree. -> followpos table will be constructed (create) by using (. and x) only. E13 . E43 e) Esij# Esij ٤١٤ ، ٤١٤، على في المالة ا ¿231 × £2,33 £23 a £23 Syntan treo

E Par	一种企业工程的	AND THE RESERVE OF THE PARTY OF		是15000000000000000000000000000000000000	ALC: NO.		
	position	followpas] >> state C= 5	2, 3, 4, =	53		
	4	2,3,4	Dransition S(C, a) and S(C,				
	2	2,3,4	0 S(Cal-1112 mag)				
	3	2,3,4	0 S(Sa) = followpas(2)				
-	4	5	= £2,343 -B				
	5		OS(C,B)=followpas(3)Ufollowpax				
-	foli	law pas table	- 1) / 3 / 1	U554	/ /		
	Now, con	struct Of A by using ted syntax tree and	= 22,3,4,		0		
	followy	pas Hable.	Transition *	Table			
	Start A	rom top					
	20 inite	al state & 1}	State 9	Input	t		
_	> Astale	A = \$ 13	A=8=3	B	b \$		
	Transit	tion S(A, a) and S(A,	B= £2,3,4}	B	C		
	0 S/A,	a) = followpas (2)					
		= 22,3,43 - · · B	C & 2, 3, 4, 5}	В	С		
	o SCA,	b)= no moure by b.	Transition	026gr	am		
	- Stal	to B = & 2, 3,43 tow S(B, a) and S(B, 5	")) a		
			a	->(B)~			
	0 5 (8, 0	2) = followpas(2) = £2,3,43 B	A A	The			
				<u> </u>			
	0 S(B, b)	1 = followpap(3) Ufollowpos	8(4)	76			
		= followpap(3) Ufollowpos = 2,3,42 U 557					
		(221=1	3				

(4)

= {2,3,4,5}-0

5