LR(0) Parser

Course Name: Compiler Design
Course Code: CSE331
Level:3, Term:3
Department of Computer Science and Engineering
Daffodil International University

Given That, $S \rightarrow A\ A$

$A \rightarrow a\ A \mid b$

We will denote an expression as $S' \rightarrow .S$

$S \rightarrow .A\ A$

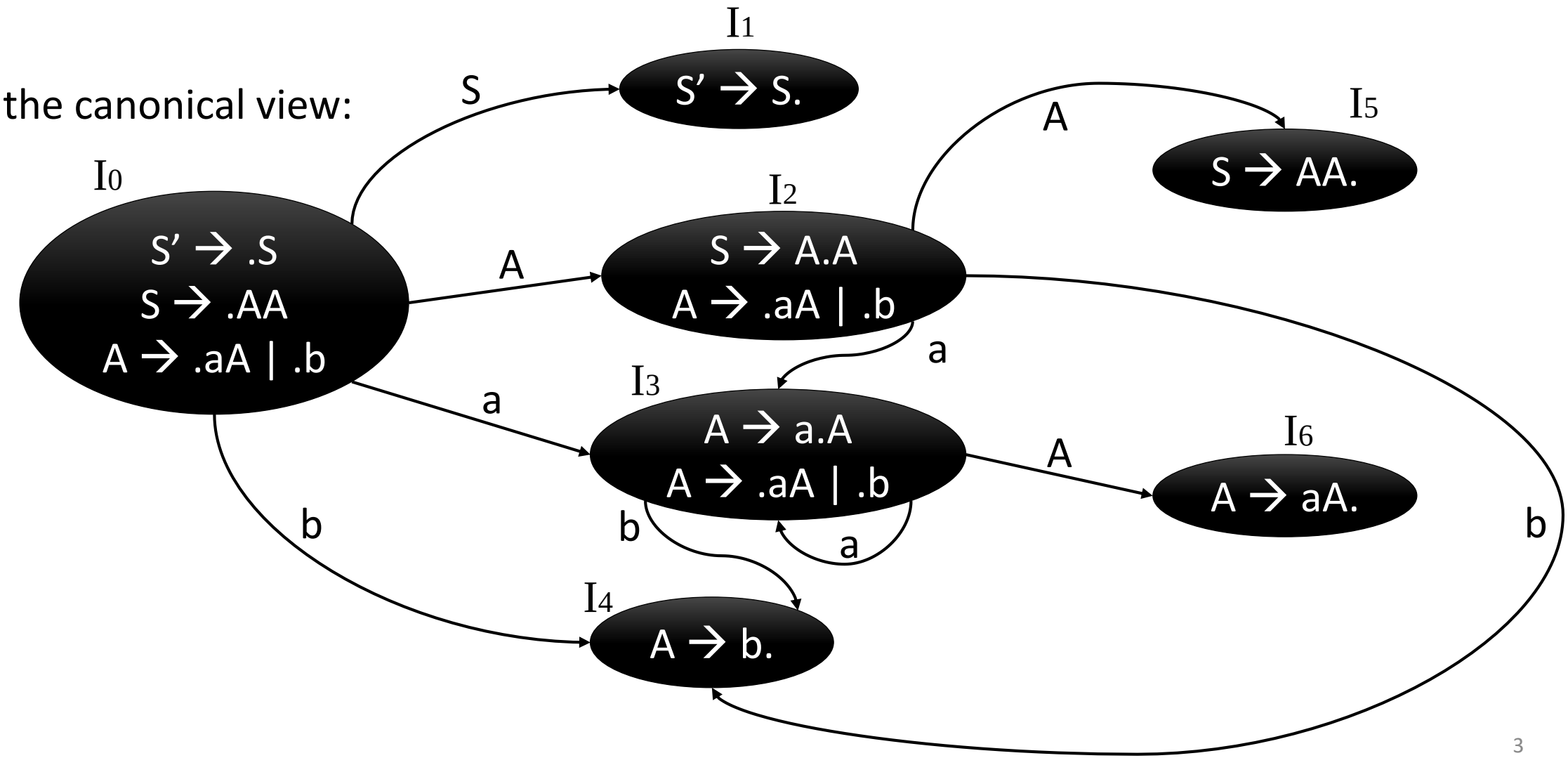
$A \rightarrow .a\ A \mid .b$

We will denote an expression as S' → .S

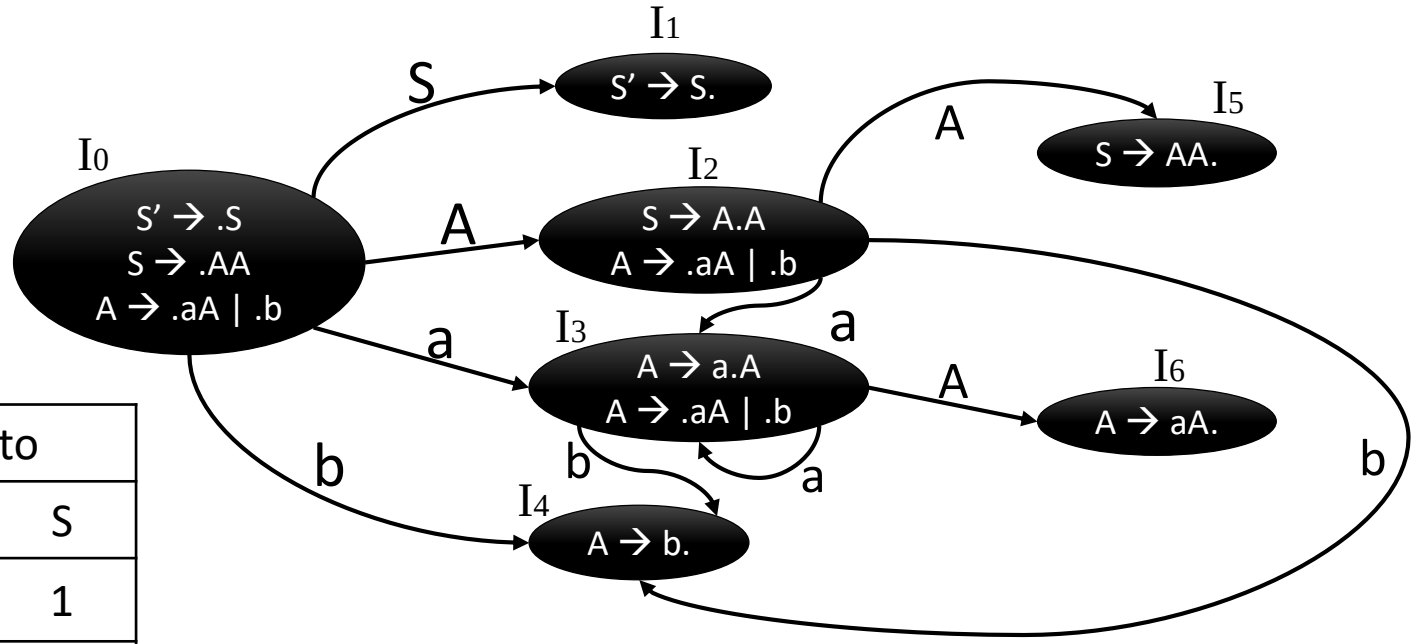
S → .A A

A → .a A | .b

So, the canonical view:



Here we can say, S → . A A ----------1
A → . a A ----------2
A → .b ----------3



States	Action			Goto	
	a	b	$	A	S
I_0	S3	S4		2	1
I_1			Accepted		
I_2	S3	S4		5	
I_3	S3	S4		6	
I_4	r3	r3	r3		
I_5	r1	r1	r1		
I_6	r2	r2	r2		

Shift (S) = Si (1,2,3)
Reduce (r) = ri (1,2,3)

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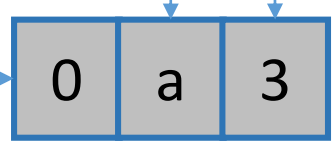

Input: a a b b $

Here we can say, S → . A A ----------1
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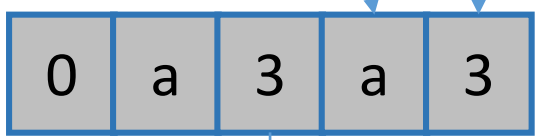

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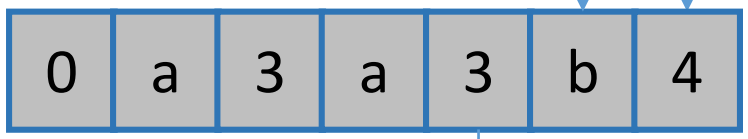

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Reduce 3, as there is one element b in right, (2x1=) 2 elements would pop up

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I_4	r3	r3	r3		
I_5	r1	r1	r1		
I_6	r2	r2	r2		

Input: a a b b $

0	a	3	a	3	b	4

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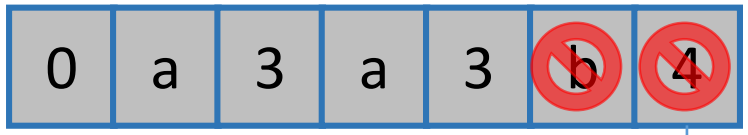

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Now, push A into stack

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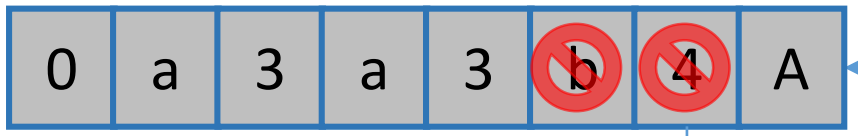

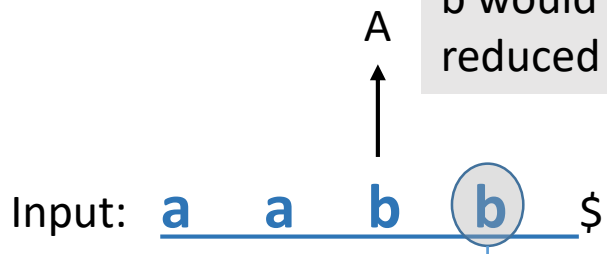

b would be reduced by A

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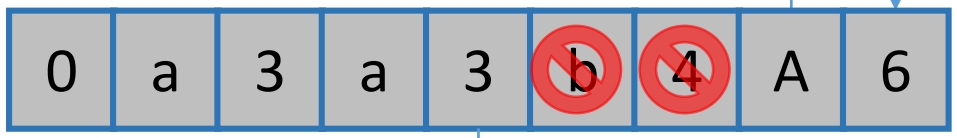

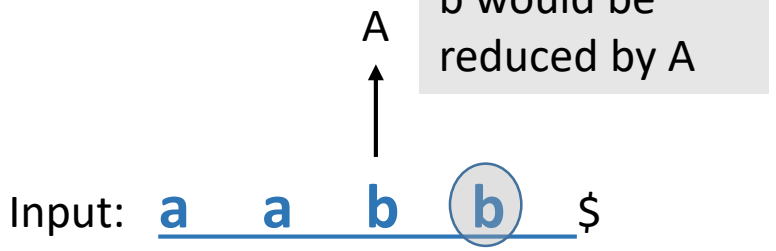

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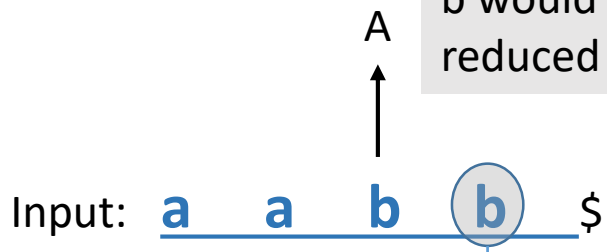

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Reduce 2, as there is two elements (a,A) in right, (2x2=) 4 elements would pop up

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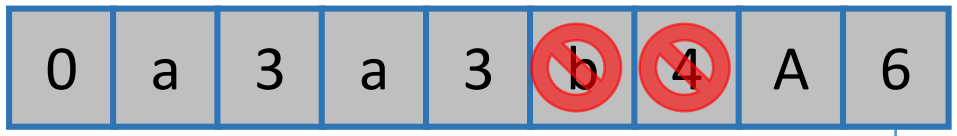

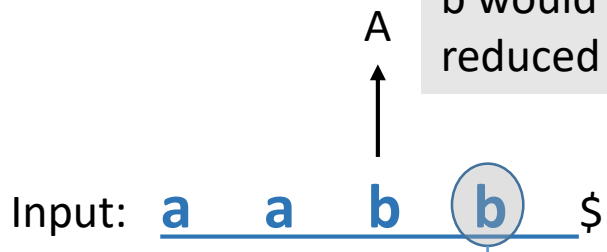

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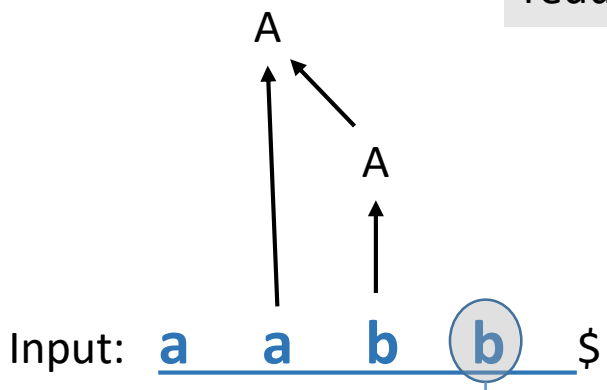
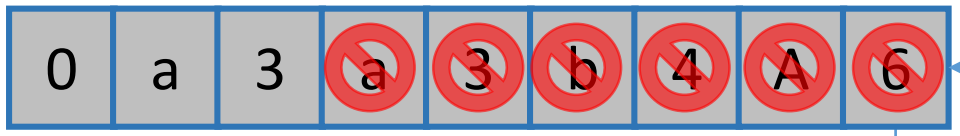
a and A would be reduced by A





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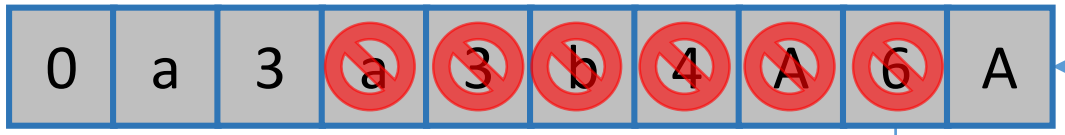

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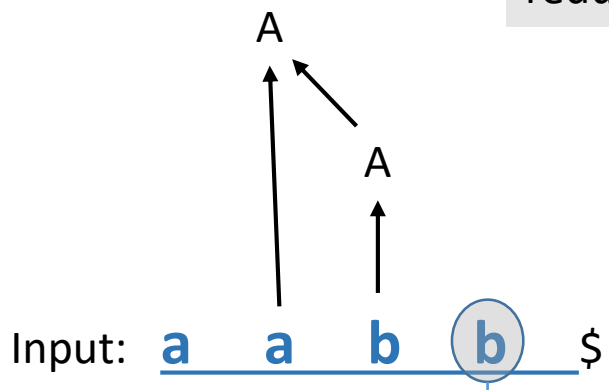

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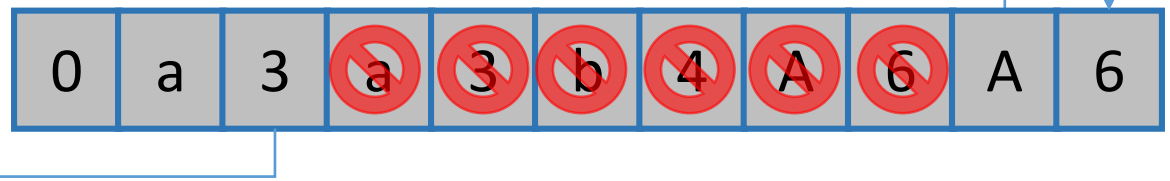

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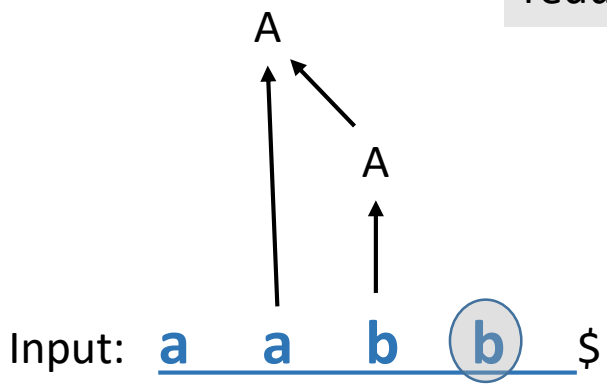

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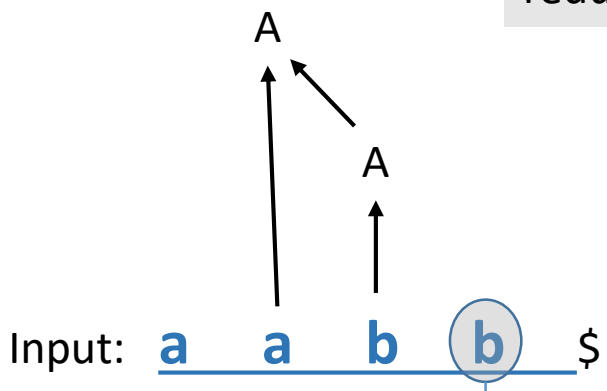

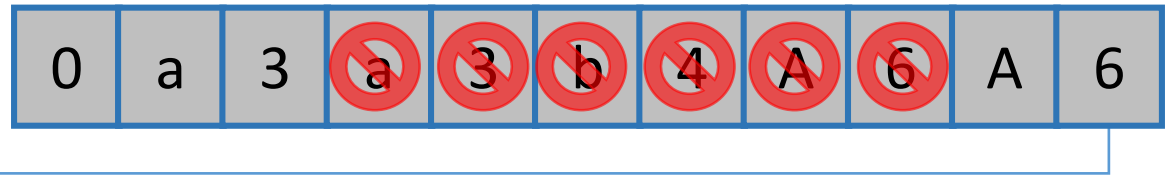

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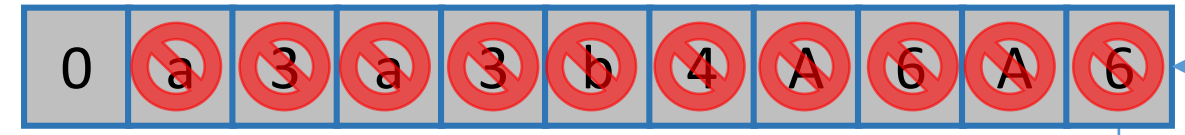

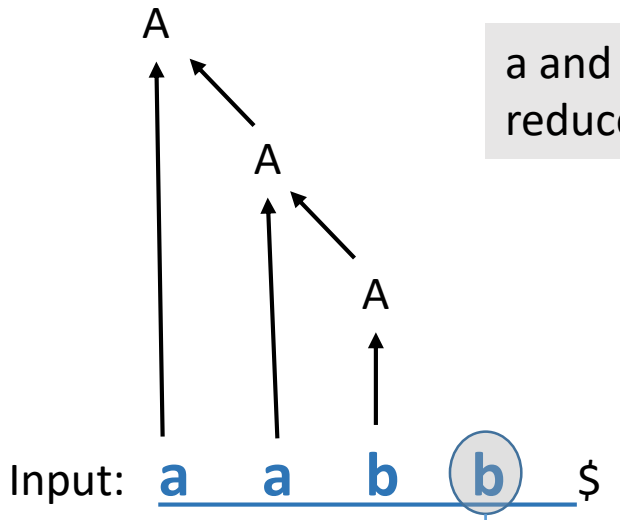

a and A would be reduced by A again

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Now, push A into stack

	Action			Goto	
	a	b	$	A	S
I_0	S3	S4		2	1
I_1			Accepted		
I_2	S3	S4		5	
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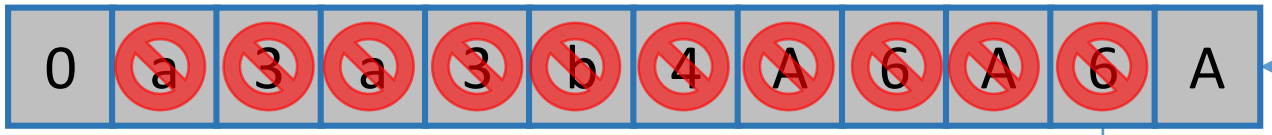

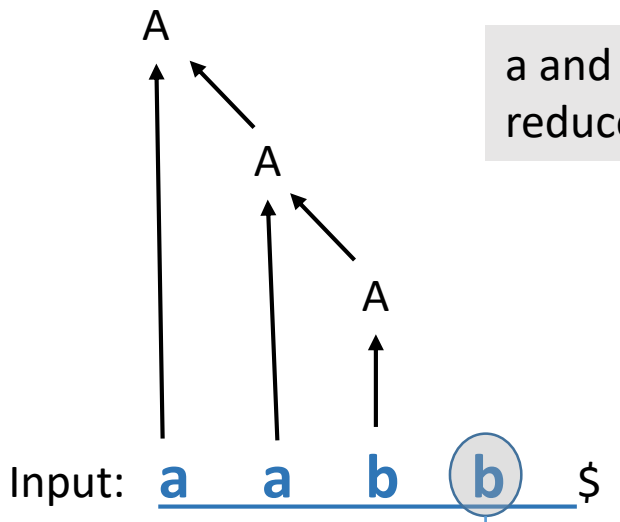

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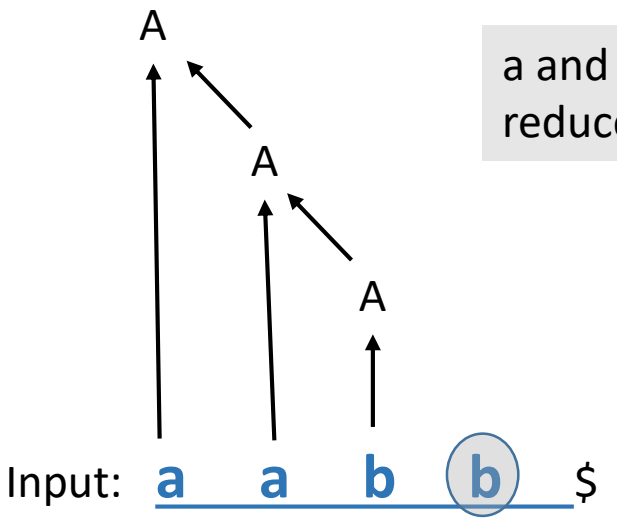

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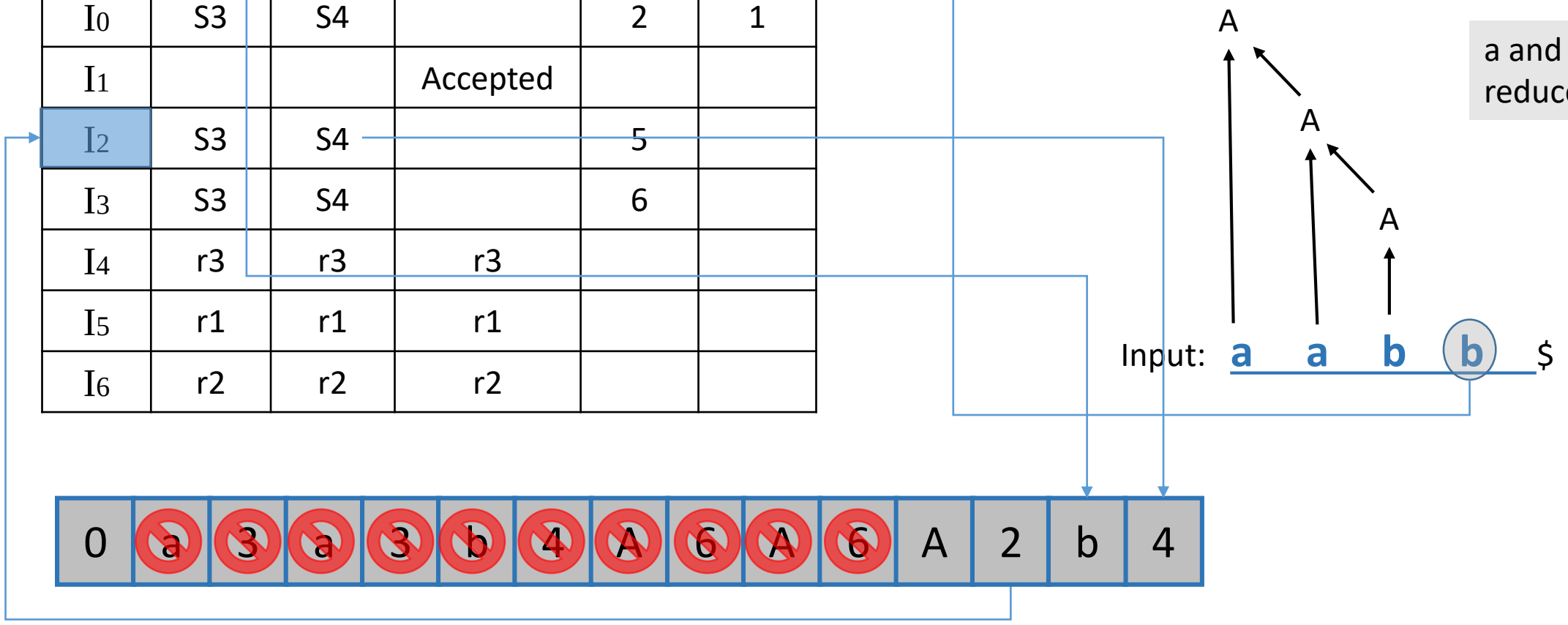

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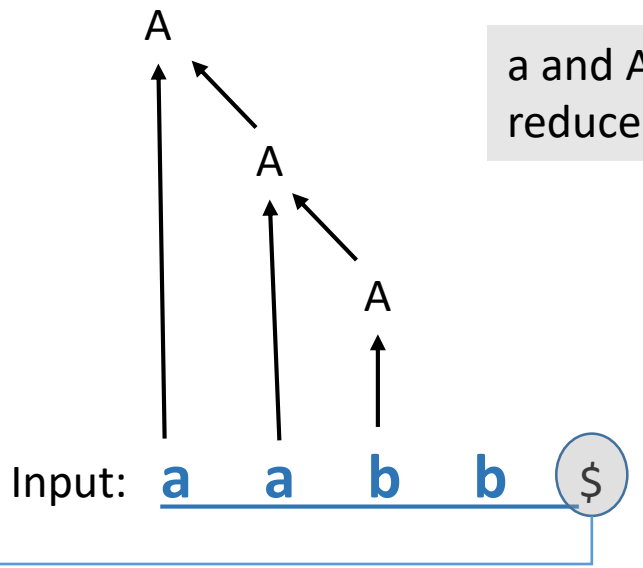

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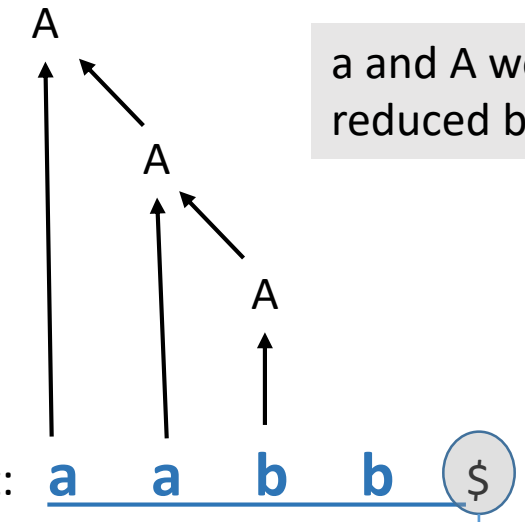
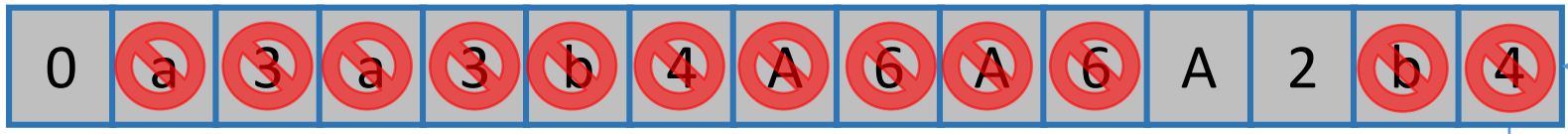
I_5	r1	r1	r1		
I_6	r2	r2	r2		



a and A would be reduced by A again



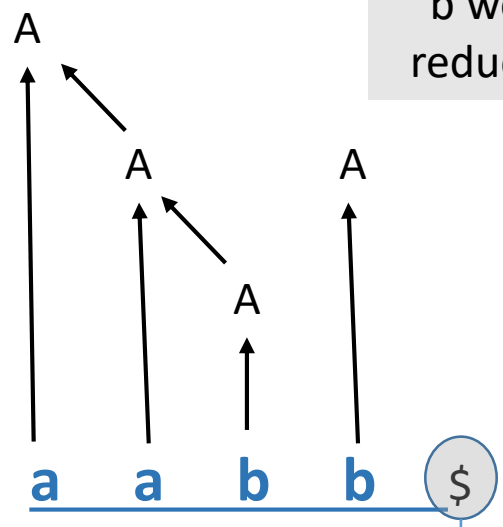
Here we can say, S → . A A ----------1
A → . a A -------2
A → .b ------3

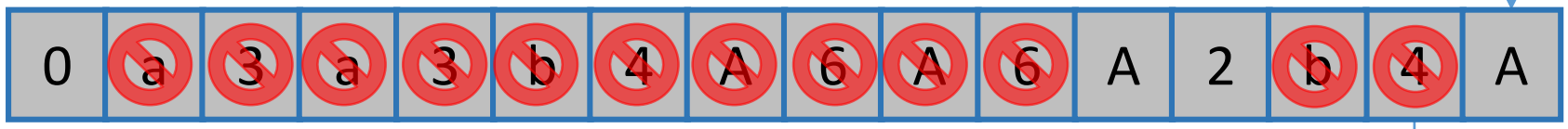
Shift (S) = Si (1,2,3)
Reduce (r) = ri (1,2,3)

Now, push A into stack

	Action			Goto	
	a	b	$	A	S
I_0	S3	S4		2	1
I_1			Accepted		
I_2	S3	S4		5	
I_3	S3	S4		6	
I_4	r3	r3	r3		
I_5	r1	r1	r1		
I_6	r2	r2	r2		

b would be reduced by A



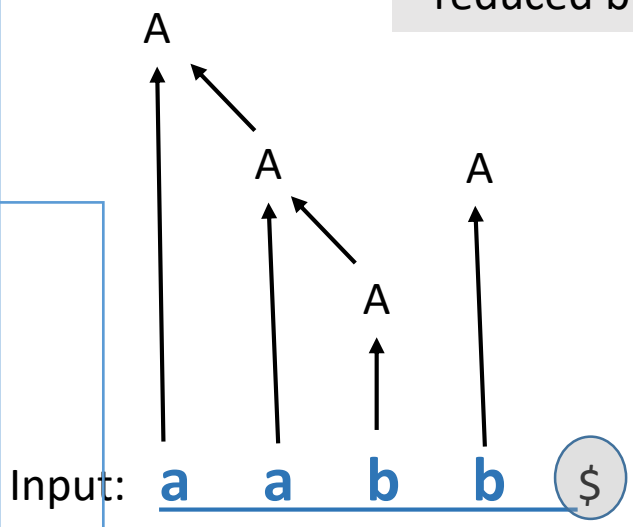


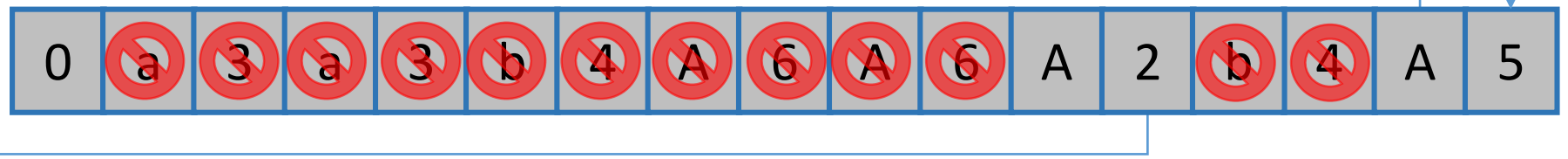
Here we can say, S → . A A ----------1
A → . a A -------2
A → .b ------3

Shift (S) = Si (1,2,3)
Reduce (r) = ri (1,2,3)

	Action			Goto	
	a	b	$	A	S
I_0	S3	S4		2	1
I_1			Accepted		
I_2	S3	S4		5	
I_3	S3	S4		6	
I_4	r3	r3	r3		
I_5	r1	r1	r1		
I_6	r2	r2	r2		

b would be reduced by A





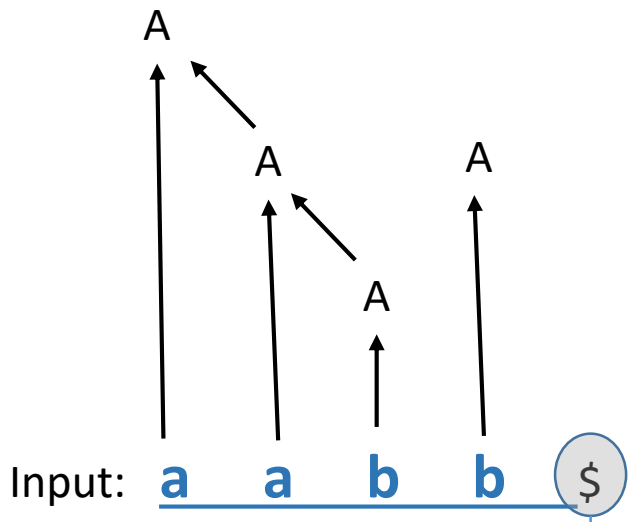
Shift (S) = Si (1,2,3)
Reduce (r) = ri (1,2,3)

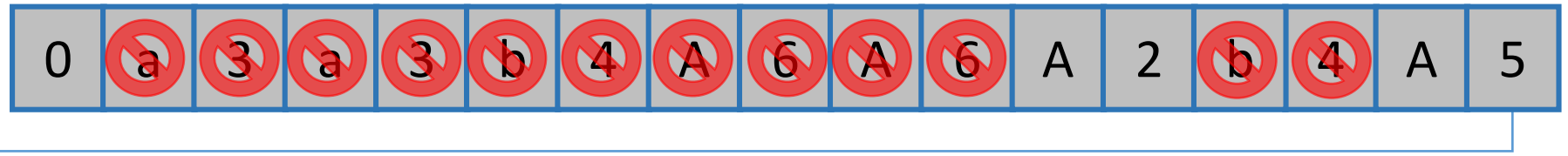
Here we can say, S → . A A ----------1
A → . a A -------2
A → .b ------3

Reduce 1, as there are two elements (A,A) in right, (2x2=) 4 elements would pop up

	Action			Goto	
	a	b	$	A	S
I_0	S3	S4		2	1
I_1			Accepted		
I_2	S3	S4		5	
I_3	S3	S4		6	
I_4	r3	r3	r3		
I_5	r1	r1	r1		
I_6	r2	r2	r2		

b would be reduced by A





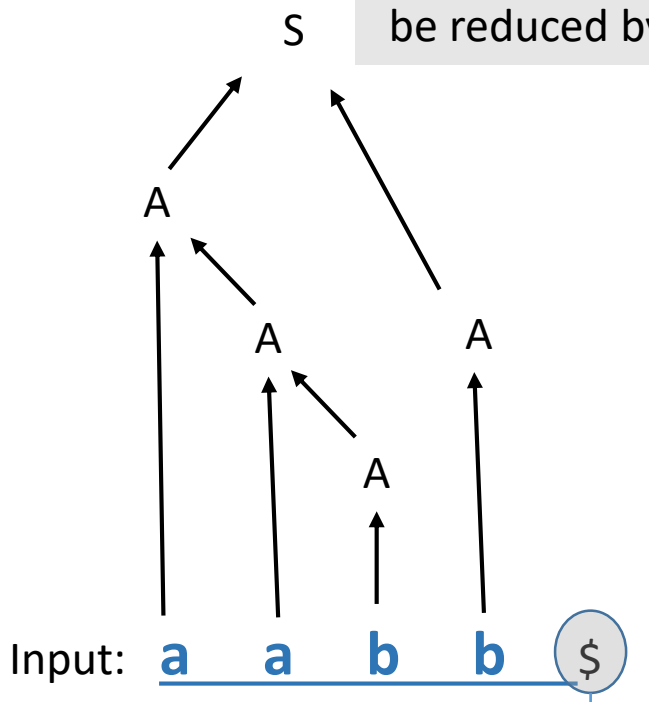
Here we can say, S → . A A ----------1
A → . a A -------2
A → .b ------3

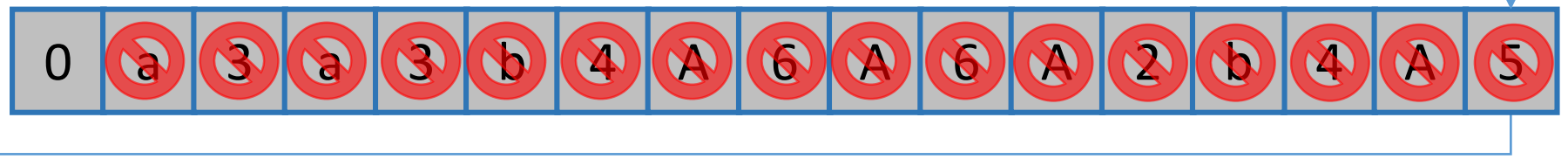
Shift (S) = Si (1,2,3)
Reduce (r) = ri (1,2,3)

Reduce 1, as there are two elements (A,A) in right, (2x2=) 4 elements would pop up

A and A would be reduced by S

	Action			Goto	
	a	b	$	A	S
I_0	S3	S4		2	1
I_1			Accepted		
I_2	S3	S4		5	
I_3	S3	S4		6	
I_4	r3	r3	r3		
I_5	r1	r1	r1		
I_6	r2	r2	r2		





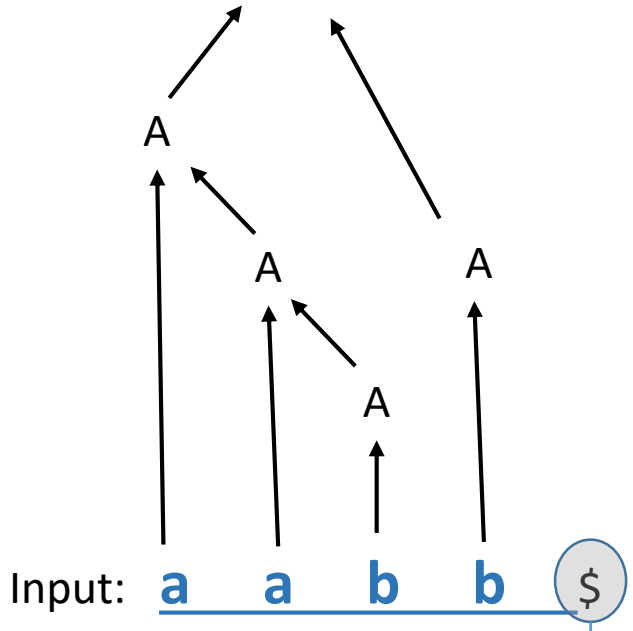
Here we can say, S → . A A ----------1
A → . a A -------2
A → .b ------3

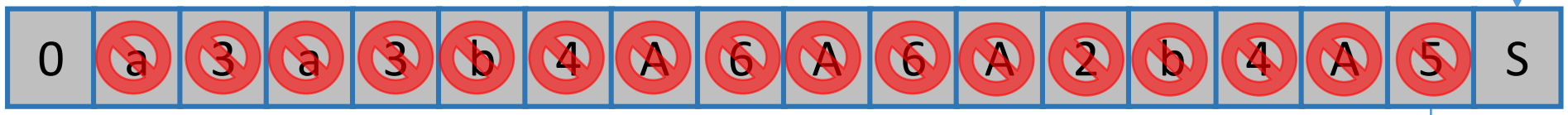
Shift (S) = Si (1,2,3)
Reduce (r) = ri (1,2,3)

Now, push S into stack

A and A would be reduced by S

	Action			Goto	
	a	b	$	A	S
I_0	S3	S4		2	1
I_1			Accepted		
I_2	S3	S4		5	
I_3	S3	S4		6	
I_4	r3	r3	r3		
I_5	r1	r1	r1		
I_6	r2	r2	r2		



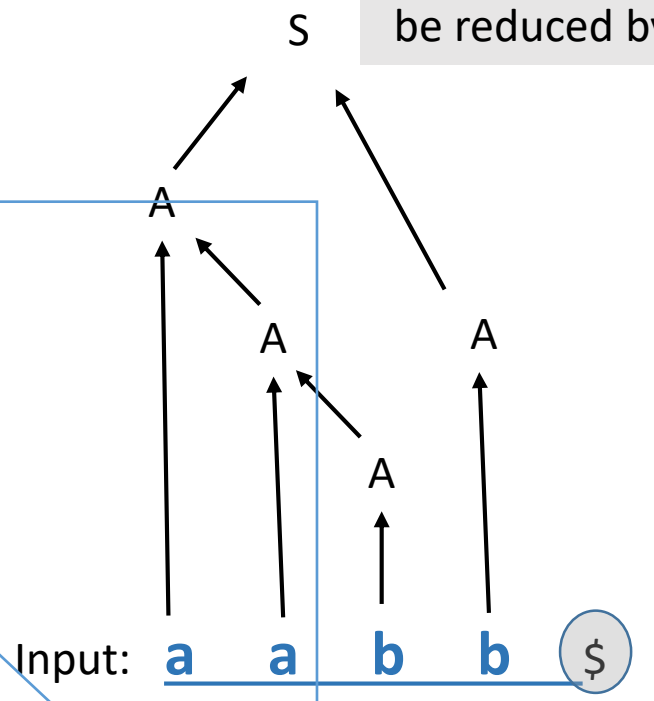


Here we can say, S → . A A ----------1
A → . a A -------2
A → .b ------3

Shift (S) = Si (1,2,3)
Reduce (r) = ri (1,2,3)

	Action			Goto	
	a	b	$	A	S
I_0	S3	S4		2	1
I_1			Accepted		
I_2	S3	S4		5	
I_3	S3	S4		6	
I_4	r3	r3	r3		
I_5	r1	r1	r1		
I_6	r2	r2	r2		

A and A would be reduced by S

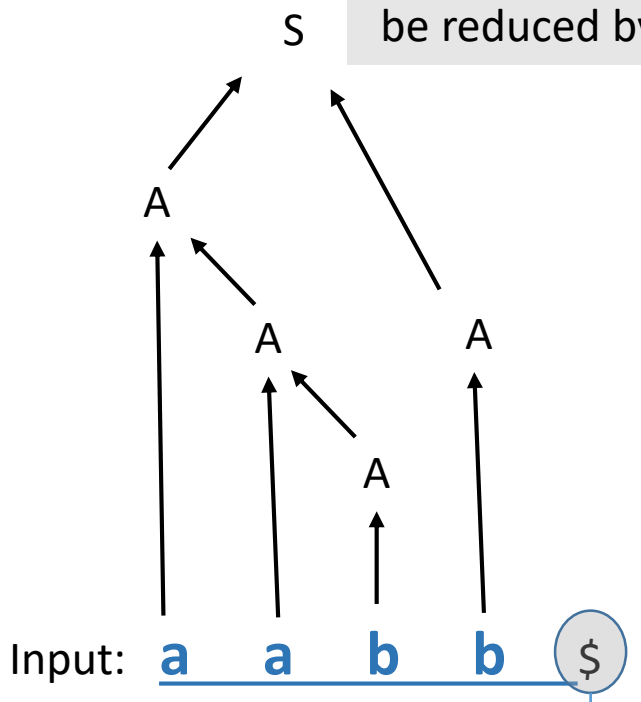


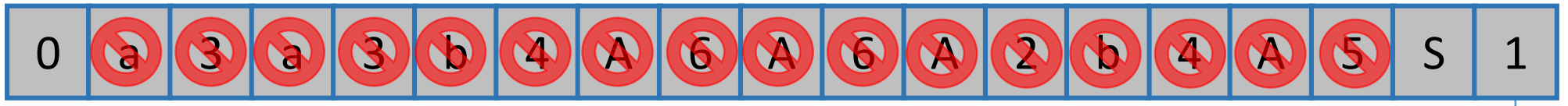
Shift (S) = Si (1,2,3)
Reduce (r) = ri (1,2,3)

Here we can say, S → . A A ----------1
A → . a A -------2
A → .b ------3

	Action			Goto	
	a	b	$	A	S
I_0	S3	S4		2	1
I_1			Accepted		
I_2	S3	S4		5	
I_3	S3	S4		6	
I_4	r3	r3	r3		
I_5	r1	r1	r1		
I_6	r2	r2	r2		

A and A would be reduced by S





THANK YOU