

S  
↓  
c

# PUSH DOWN AUTOMATA

$L = \{ \text{Polindrome with middle Symbol 'c'} \}$

$S \rightarrow aSa \mid bSa \mid c$

a
20

S  
aSa  
a b S b a  
a b c b a

S  
aSa  
a a S a a  
a a c a a

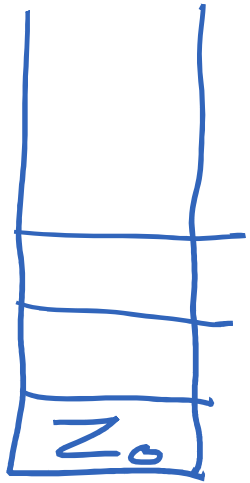
S  
b S b  
b a S a b  
b a c a b

S  
b S b  
b b S b b  
b b c b b

b
20

# PUSH DOWN AUTOMATA

Stack



abcba

(1) Push a

(2) Push b

(3)

middle Symbol

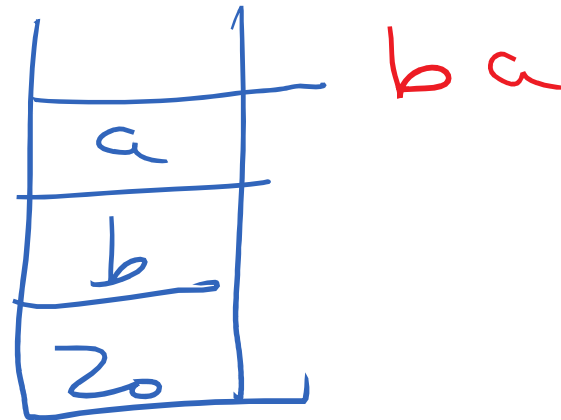
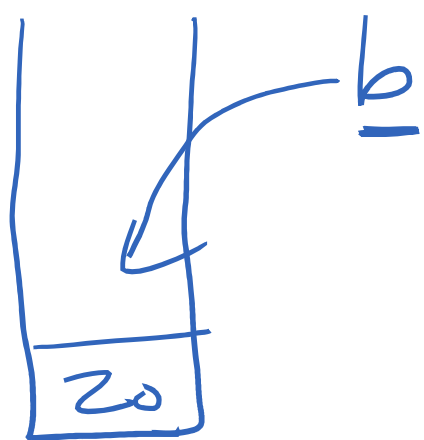
Stop Push operation

Neither Push or Pop 'c'

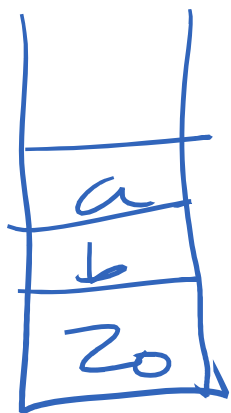
(4) Compare 'b' in i/p with TOS, Pop 'b'

(5) Compare 'a' in i/p with TOS, Pop 'a'.

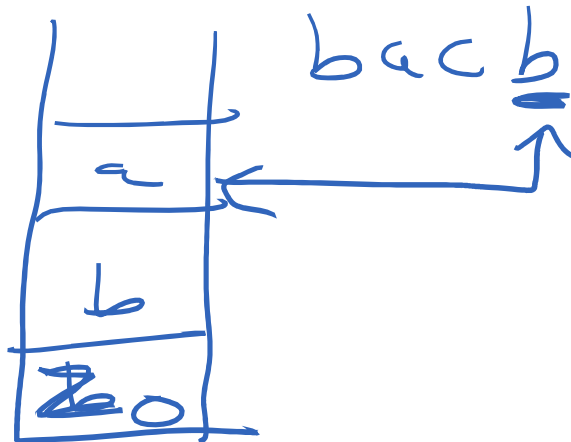
# PUSH DOWN AUTOMATA



c  
aca  
aacaca



bac



Crash

# PUSH DOWN AUTOMATA

state	i/P	To S	Move	Rule No.	
$q_0$	a	$z_0$	$(q_0, a z_0)$	1	
$q_0$	b	$z_0$	$(q_0, b z_0)$	2	
$q_0$	a	a	$(q_0, a a)$	3	✓
$q_0$	b	a	$(q_0, b a)$	4	✓
$q_0$	b	b	$(q_0, b b)$	5	✓
$q_0$	a	b	$(q_0, a b)$	6	✓
$q_0$	c	a	$(q_1, a)$	7	
$q_n$	c	b	$(q_1, b)$	8	

# PUSH DOWN AUTOMATA

State	i/p	To S	Move	Rule No.
$q_1$	a	a	$(q_1, \Lambda)$	9
$q_1$	b	b	$(q_1, \Lambda)$	10
$q_1$	$\Lambda$	$Z_0$	$(q_2, Z_0)$	11
$q_0$	c	$Z_0$	$(q_1, Z_0)$	12

$q_2$  accepting state

# PUSH DOWN AUTOMATA

$(q_0, aacaa, z_0)$   
①

$(q_0, acaa, az_0)$   
②

$(q_0, caa, aaz_0)$   
⑦

$(q_1, aa, aaz_0)$   
⑨

$(q_1, a, aaz_0)$   
⑩

$(q_1, \Lambda, z_0)$   
⑪

$(q_2, z_0).$

Accept

## PUSH DOWN AUTOMATA

$(q_0, abcbb, z_0)$

①

$(q_0, bcbb, a z_0)$

④

$(q_0, cbb, ba z_0)$

⑤

$(q_1, bb, ba z_0)$

⑩

$(q_1, b, a z_0)$

Crash

# PUSH DOWN AUTOMATA

$(q_0, c, z_0)$ .

①<sub>2</sub>

$(q_1, \wedge, z_0)$  -

①<sub>1</sub>

$(q_2, z_0)$

Accept



## PUSH DOWN AUTOMATA

$(q_0, aacaa, z_0)$

①

$(q_0, aca, az_0)$

③

$(q_0, ca, aaz_0)$

⑦

$(q_1, a, aaz_0)$

⑨

$(q_1, \Lambda, aaz_0)$

crash

## PUSH DOWN AUTOMATA

$(q_0, \epsilon, z_0)$

12

$(q_1, a, z_0)$

11

$(q_2, a, z_0)$

Crash.

Without reading  
entire input we  
cannot conclude the  
final status