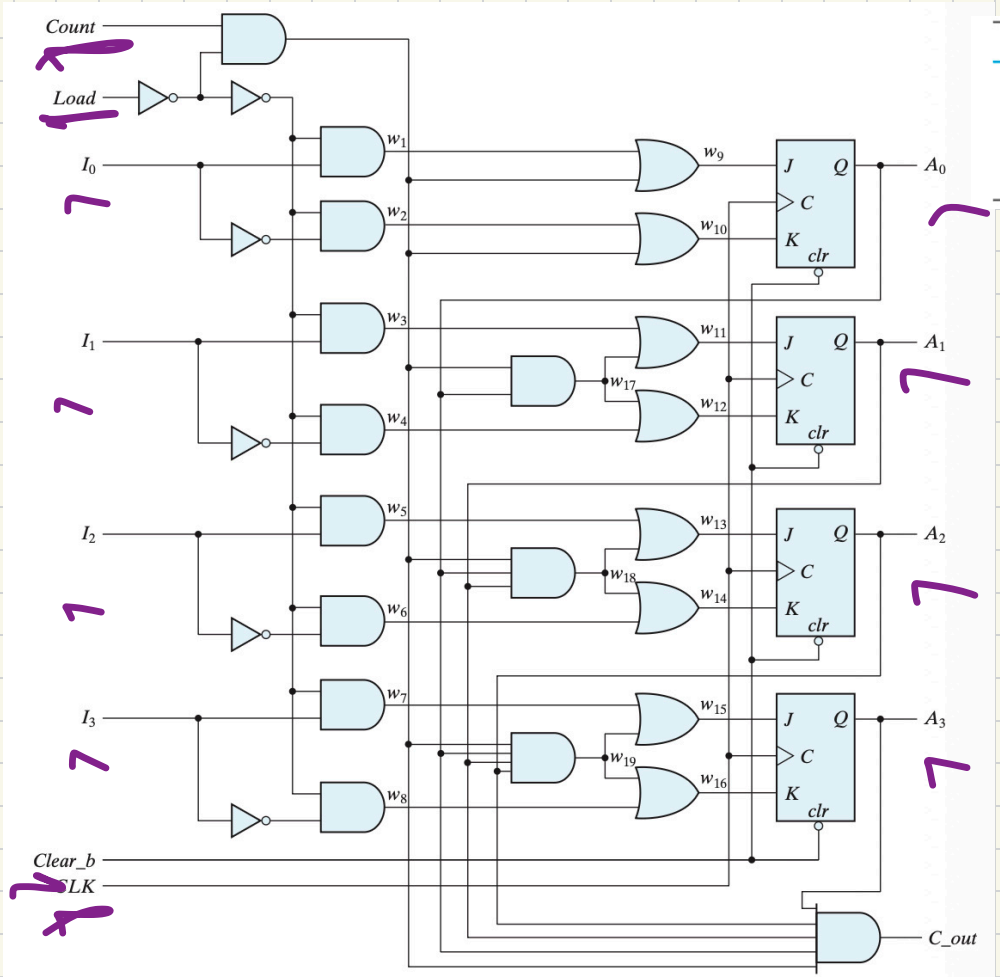
ACOL 215 (25th Nov.)

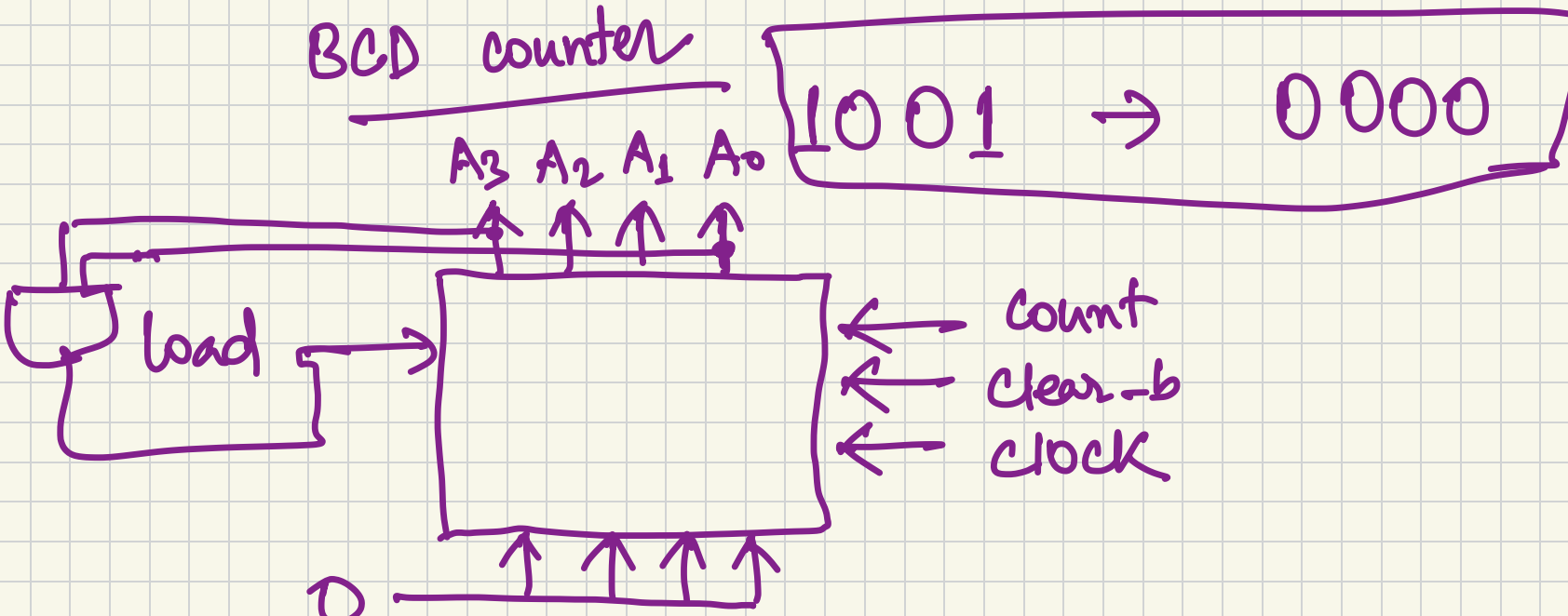
Binary counter with parallel load

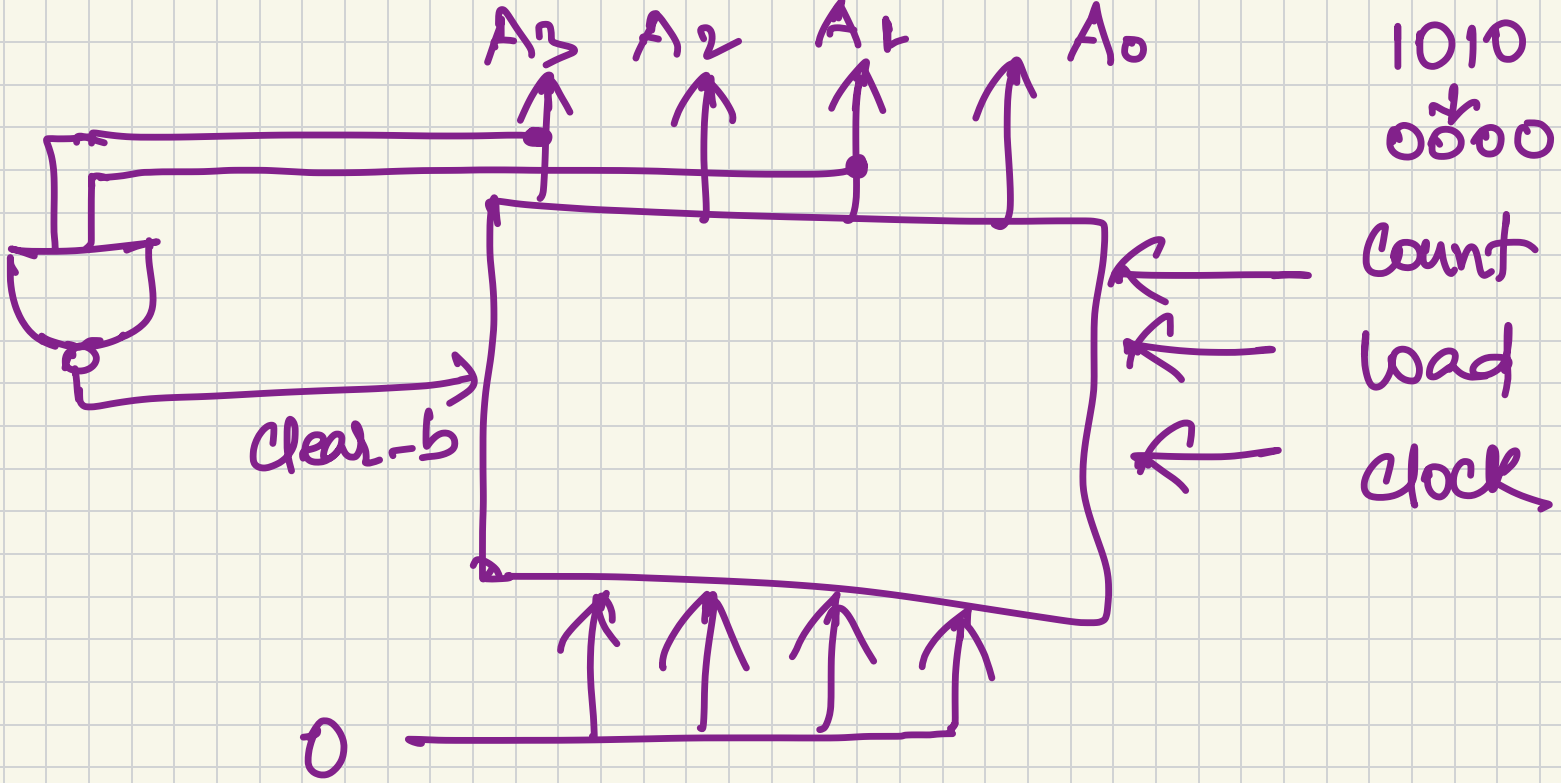
Counters employed in digital systems may require a parallel load capability → to load a number into the counter and count from there.



Clear_b	CLK	Load	Count	Function
0	X	X	X	Clear to 0
1	↑	1	X	Load inputs
1	↑	0	1	Count next binary state
1	↑	0	0	No change

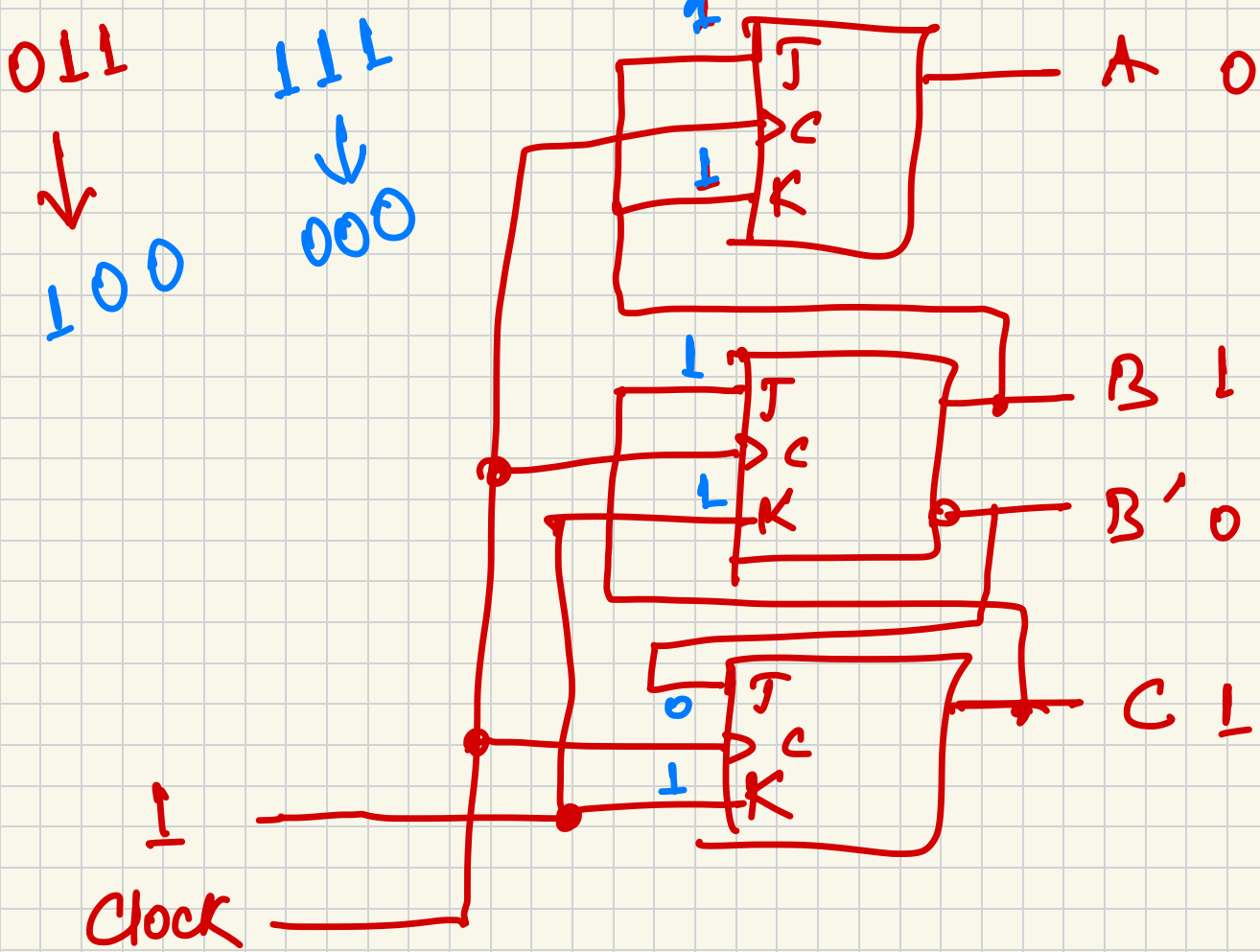
A counter with parallel load can be used to generate any desired count sequence.




A3
A2
A1
A0
1010
0000
count
load
clock
clear-b
0

Counters with unused states

Present State			Next State			Flip-flop inputs					
A	B	C	A	B	C	J_A	K_A	J_B	K_B	J_C	K_C
0	0	0	0	0	1	0	X	0	X	1	X
0	0	1	0	1	0	0	X	1	X	X	1
0	1	0	1	0	0	1	X	X	1	0	X
1	0	0	1	0	1	X	0	0	X	1	X
1	0	1	1	1	0	X	0	1	X	X	1
1	1	0	0	0	0	X	1	X	1	0	X
0	1	1									
1	1	1									
						$\overline{B}$	$\overline{B}$	$\overline{C}$	1	$\overline{D}'$	1


011
100
111
000
1
J
C
K
1
A 0
1
J
C
K
1
B 1
B' 0
0
J
C
K
1
C 1
1
Clock