Lab 5a

- State transition table is basically a truth table showing the functionality of a circuit based on a given present state.
  - Present state are like a truth table's inputs and Next state are similar to a truth table's outputs
- A state transition diagram is a web-like diagram that shows how states proceed from one to the next

- A state machine needs two elements to function. A memory element to hold current state and some way to determine the next state. With flip-flops we have two such elements.
  - flip-flops: current state & set of static logic gates
  - Registers are constructed using one or more flip-flops that share common signal (such as clock)
  - Reg is used for updated alway outputs

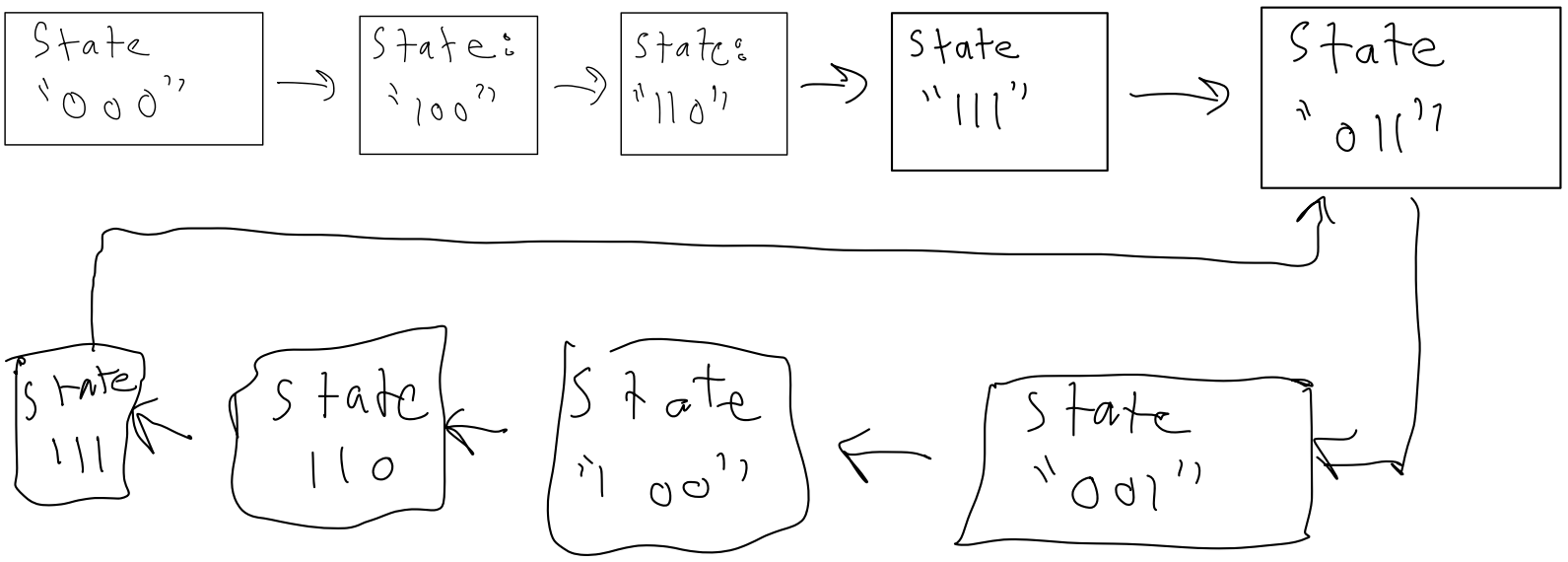
PRE LAB

Table 1: Pre-Lab Transition Table

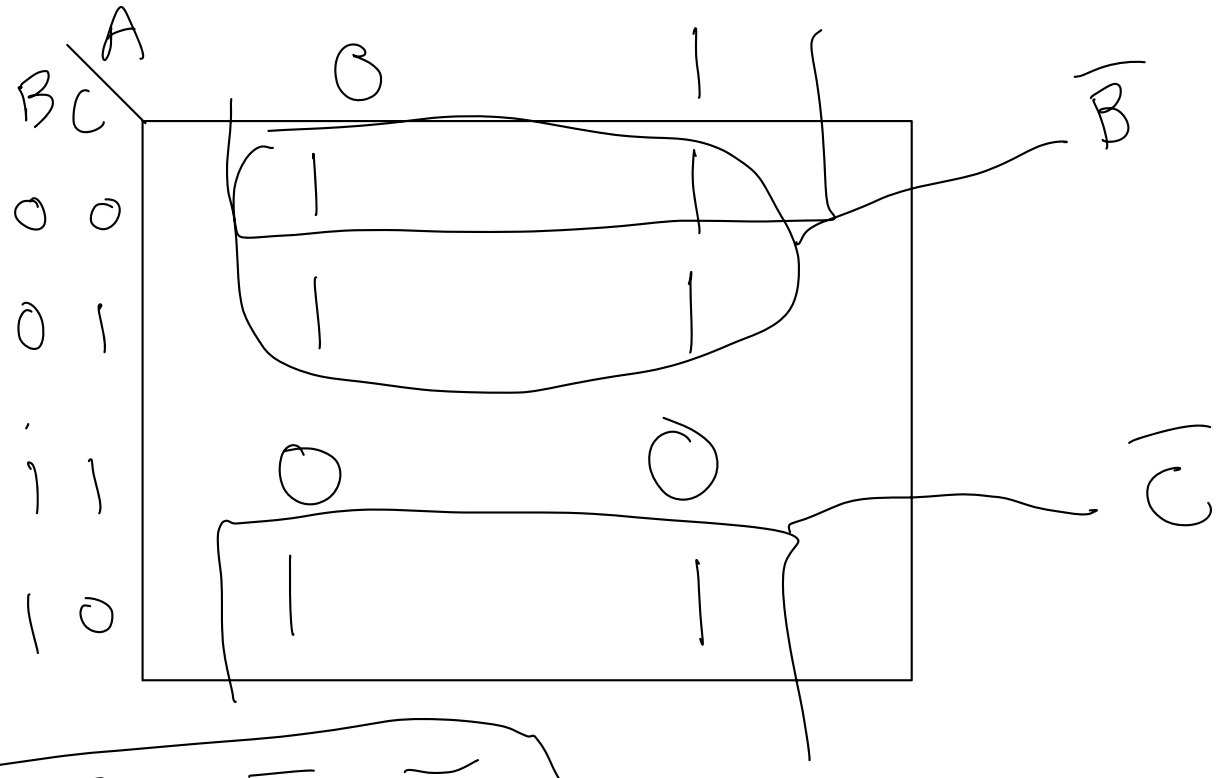
PRESENT STATE (Inputs)			NEXT STATE (Outputs)		
A	B	C	NextA	NextB	NextC
0	0	0	1	0	0
0	0	1	1	0	0
0	1	0	1	0	1
0	1	1	0	0	1
1	0	0	1	1	0
1	0	1	1	1	0
1	1	0	1	1	1
1	1	1	0	1	1

$Q = J Q' + K' Q$

Transition Diagram

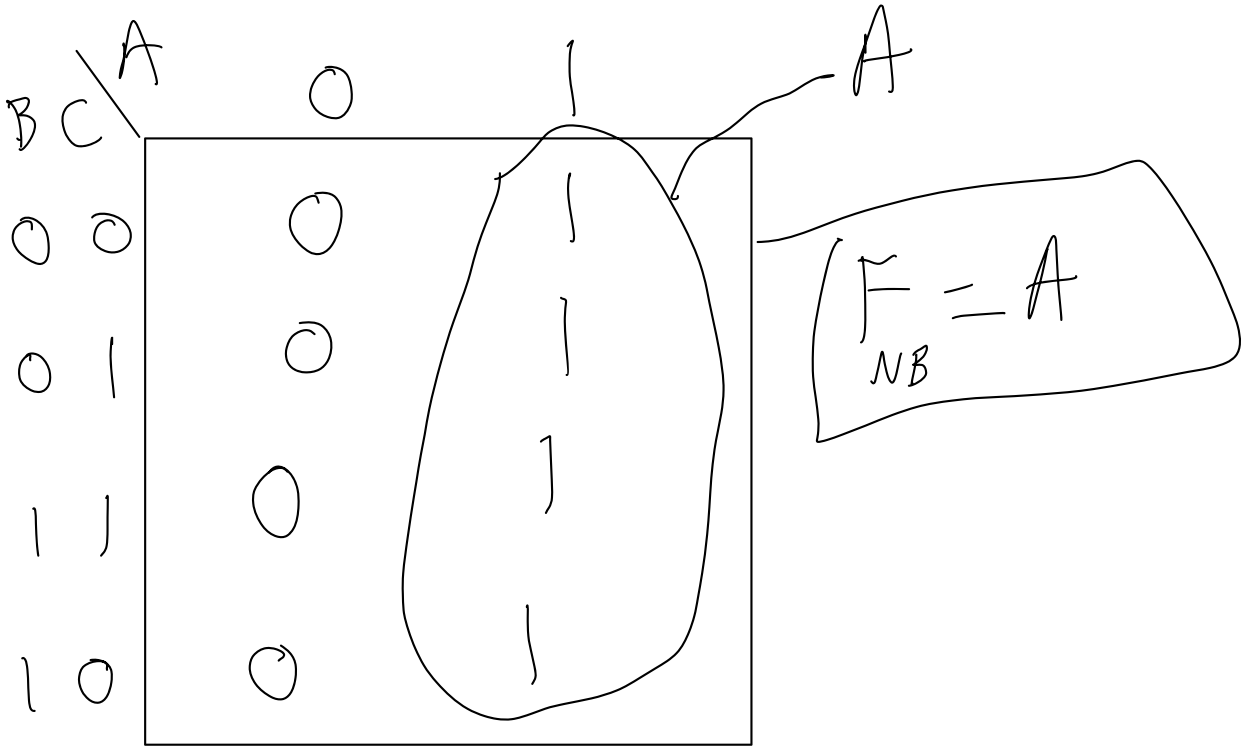


Next A k-map $\Sigma m(0,1,2,4,5,6)$



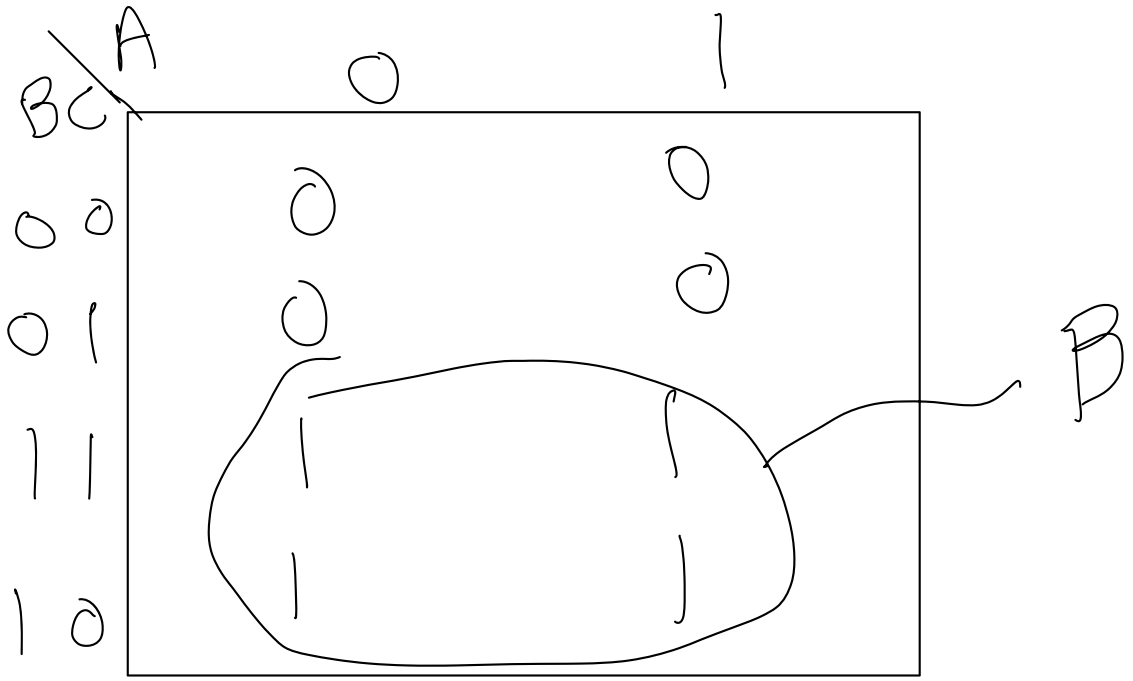
$$F_{NA} = \bar{B} + \bar{C}$$

Next B k-map $\Sigma m(4,5,6,7)$



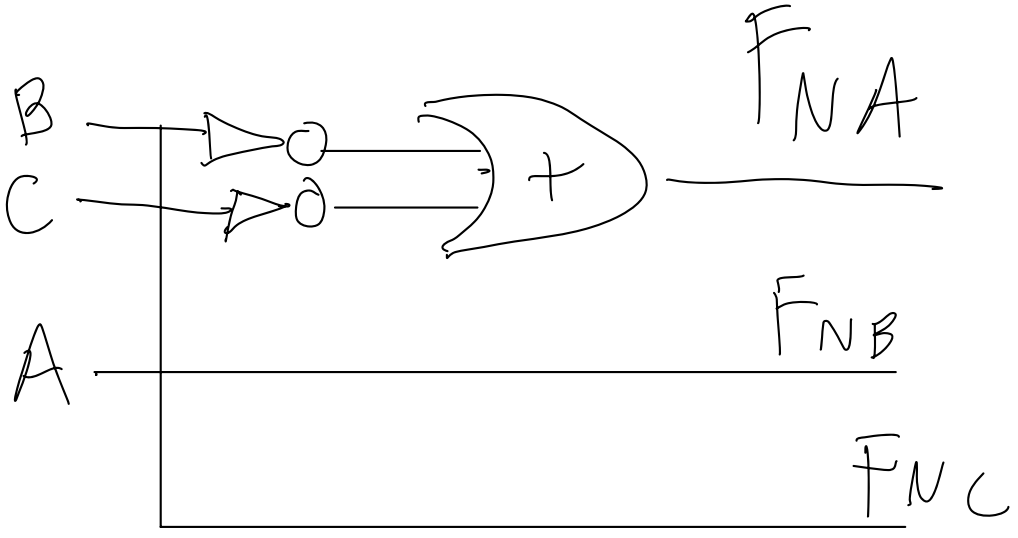
$$F_{NB} = A$$

Next C k-map $\Sigma m(2,3,6,7)$

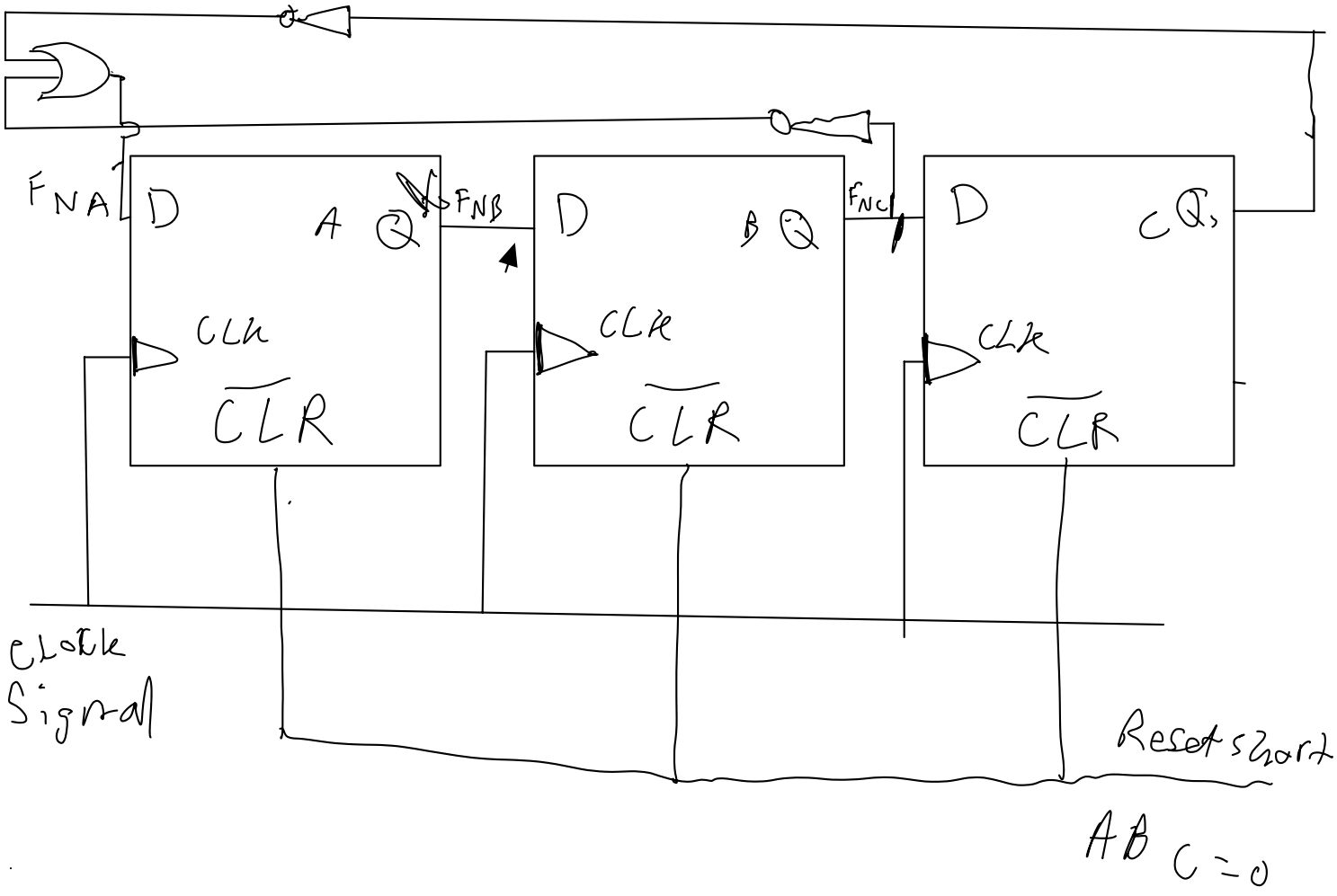


$F_{NC} = B$

Combination Logic Design



Schematic

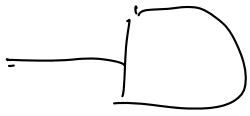


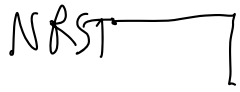
DFF → in D
in CLK
in RST
out Q

assign

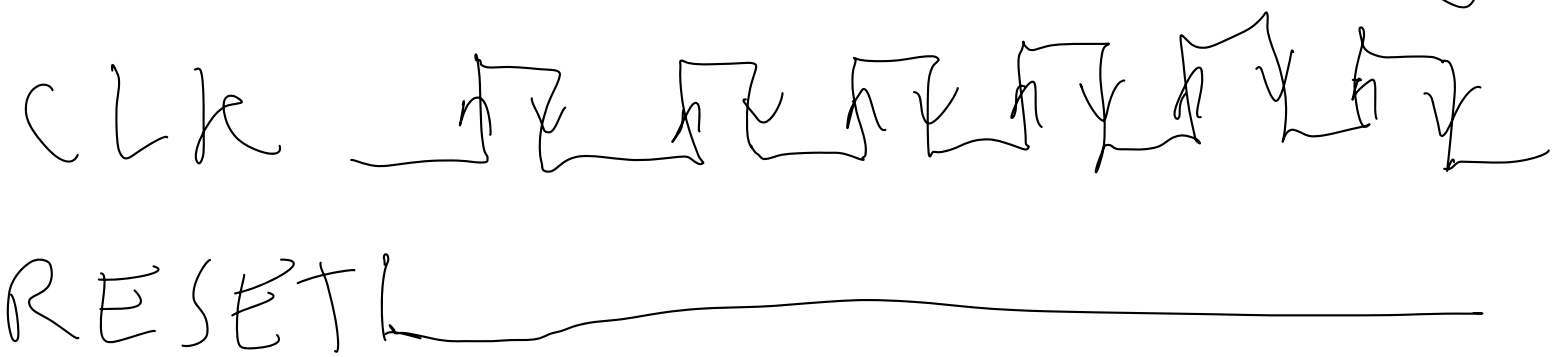
D . CL → D → Q, Q'

~~D + (CLK) + Q~~





Explain what happening



whenever CLK rises
that is when it sends
a signal to A, then B,
then C