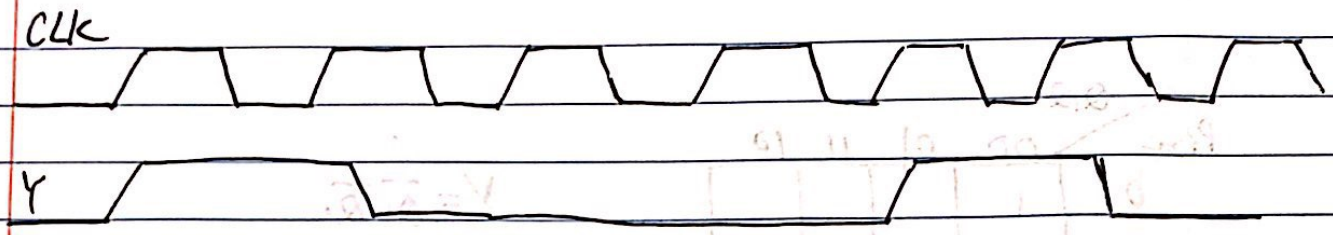
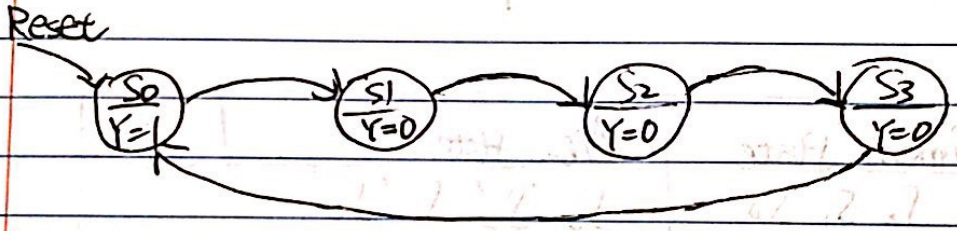
CS4341 Assignment 4

(1A)



(1B) FSM



(1C)

Rest	Current State		Next State		Output
	Q_1	Q_0	Q_1^+	Q_0^+	Y
1	X	X	0	0	1
0 (S_0)	0	0	0	1	1
0 (S_1)	0	1	1	0	0
0 (S_2)	1	0	1	1	0
0 (S_3)	1	1	0	0	0

Q_1^+

Reset \ Q_1Q_0	00	01	11	10
0		1		1
1				

$Q_1^+ = \overline{Rest}\,\overline{Q_1}Q_0 + \overline{Rest}\,Q_1\overline{Q_0}$

$= \overline{Rest}\,(Q_1 \oplus Q_0)$

Rese \ Q_1Q_0	00	01	11	10
0	(1)			(1)
1				

$$Q_0^+ = \overline{Rese} + \overline{Q_0}$$

Rese \ Q_1Q_0	00	01	11	10
0	1			
1	x	x	x	x

$$Y = \overline{Q_1}\,\overline{Q_0}$$

Circuit on other file

(1D)

Rest	Current state $S_3\ S_2\ S_1\ S_0$	Next state $S_3'\ S_2'\ S_1'\ S_0'$	Y
1	x x x x	0 0 0 0	1
0 (S_0)	0 0 0 1	0 0 1 0	1
0 (S_1)	0 0 1 0	0 1 0 0	0
0 (S_2)	0 1 0 0	1 0 0 0	0
0 (S_3)	1 0 0 0	0 0 0 1	0

S_3'

Rese \ $S_3S_2S_1S_0$	0001	0010	0100	1000
0			(1)	
1				

$$S_3' = \overline{S_3}\,S_2\,\overline{S_1}\,\overline{S_0}$$

S_2'

Rese \ $S_3S_2S_1S_0$	0001	0010	0100	1000
0		(1)		
1				

$$S_2' = \overline{S_3}\,\overline{S_2}\,S_1\,\overline{S_0}$$

$= ?$

CS4341 Assignment

(2A) State table

Present state	next state
A B C	A' B' C'
0 0 1	0 1 1
0 1 1	0 1 0
0 1 0	1 1 0
1 1 0	1 1 1
1 1 1	1 0 1
1 0 1	0 0 1

Excitation table for JK-Flip Flop.

Q	Q^+	J	K
0	0	0	X
0	1	1	X
1	0	X	1
1	1	X	0

State excitation table

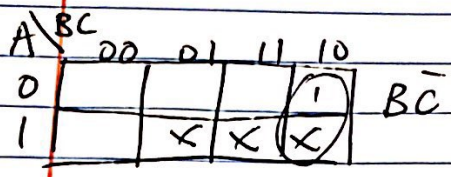
Present State	Next State	Input		
A B C	A'B'C'	J_1 k_1	J_2 k_2	J_3 k_3
0 0 1	0 1 1	0 X	1 X	X 0
0 1 1	0 1 0	0 X	X 0	X 1
0 1 0	1 1 0	1 X	X 0	0 X
1 1 0	1 1 1	X 0	X 0	1 X
1 1 1	1 0 1	X 0	X 1	X 0
1 0 1	0 0 1	X 1	0 X	X 0

11

4

(2B) k-map

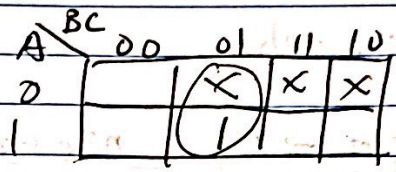
J1



$B\bar{C}$

$J_1 = B\bar{C}$

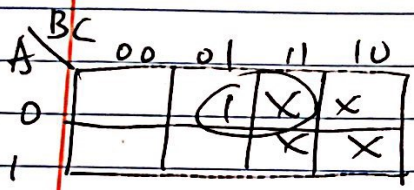
K1



$\bar{B}C$

$K_1 = \bar{B}C$

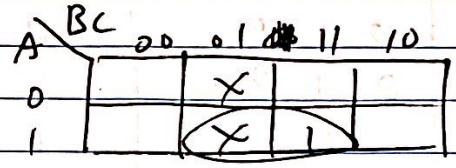
J2



$\bar{A}C$

$J_2 = \bar{A}C$

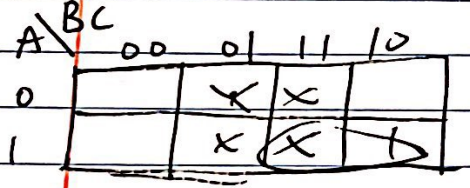
K2



AC

$K_2 = AC$

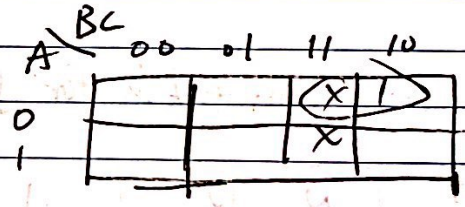
J3



AB

$J_3 = AB$

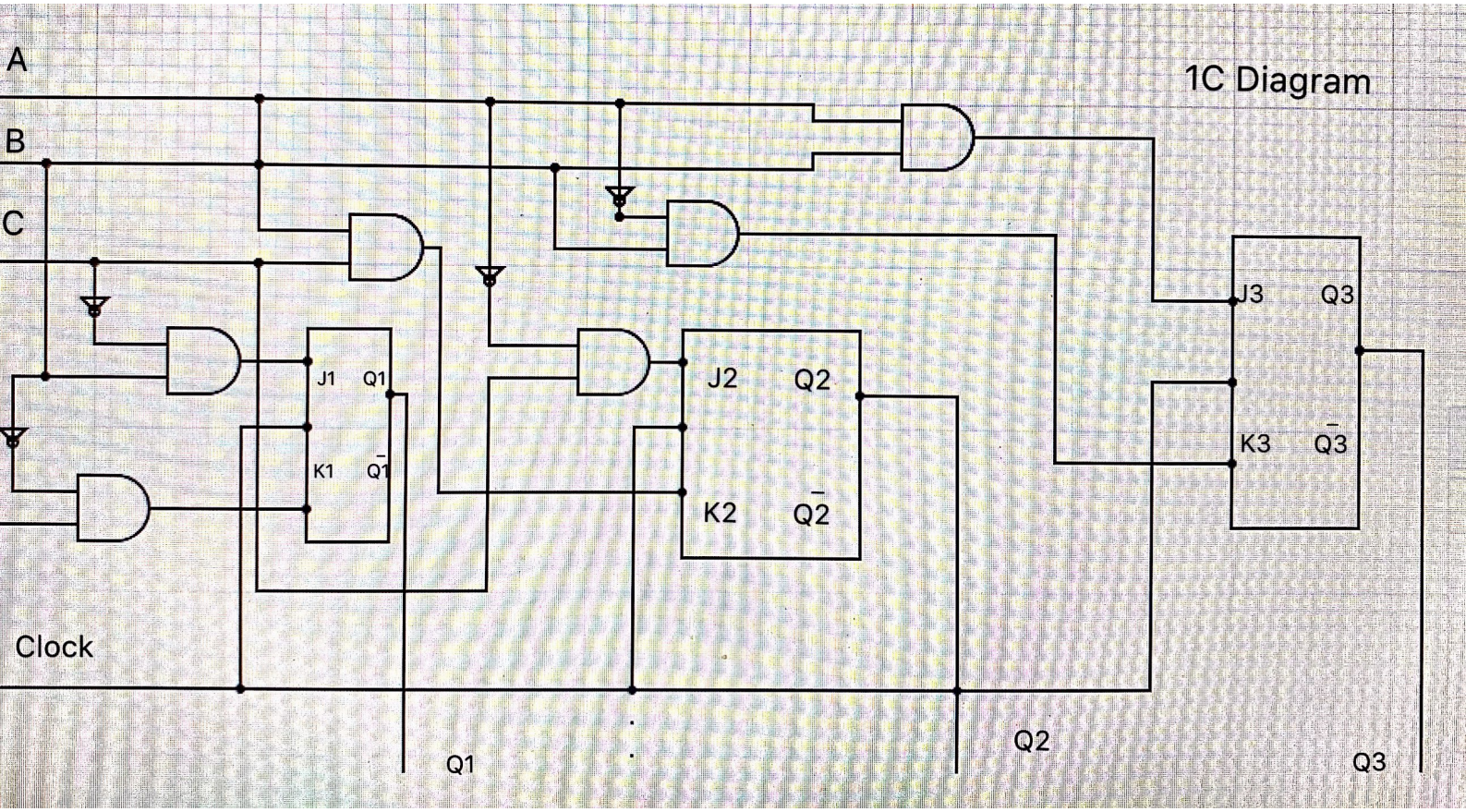
K3

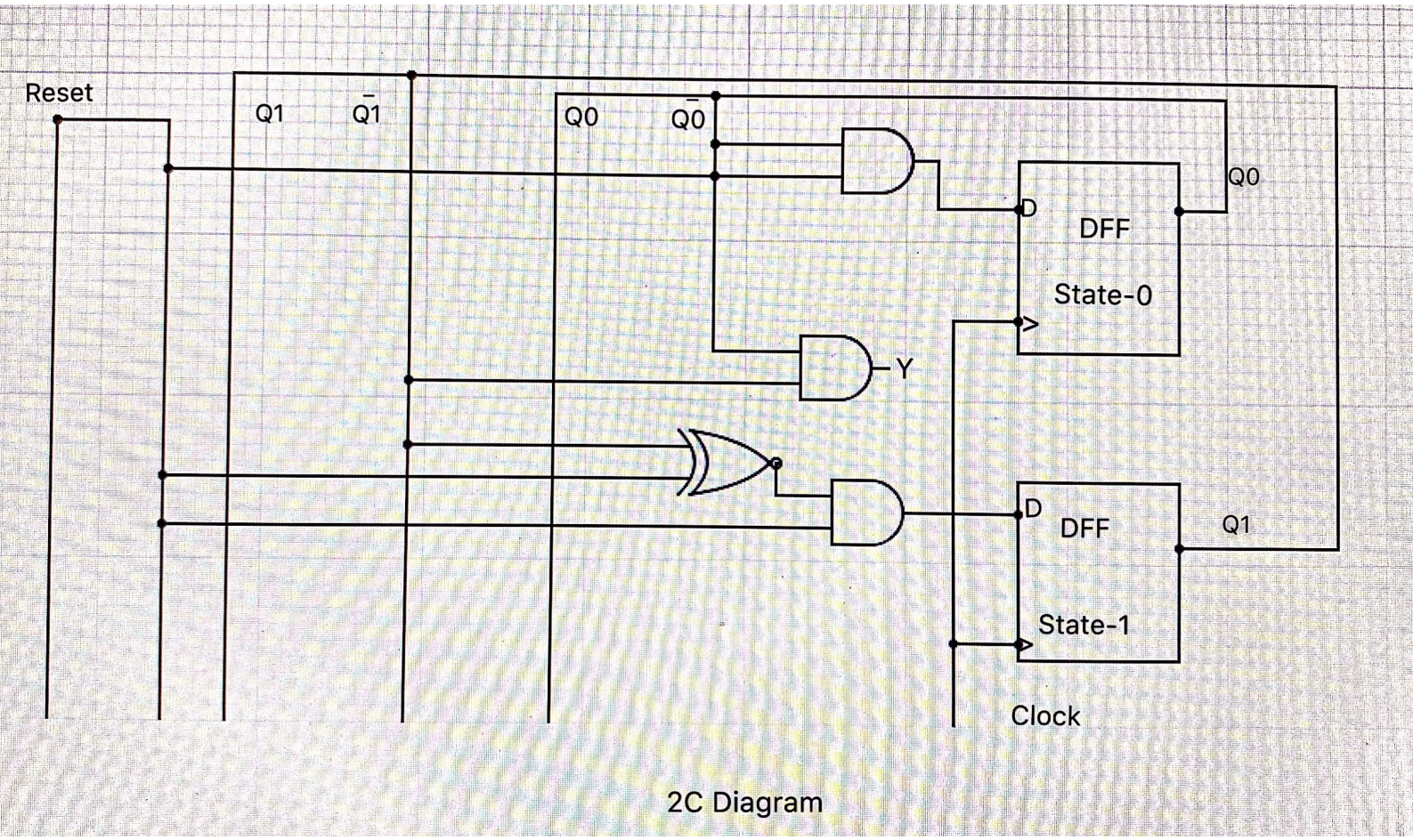


$\bar{A}B$

$K_3 = \bar{A}B$

(2C) drawing on another file.





2C Diagram