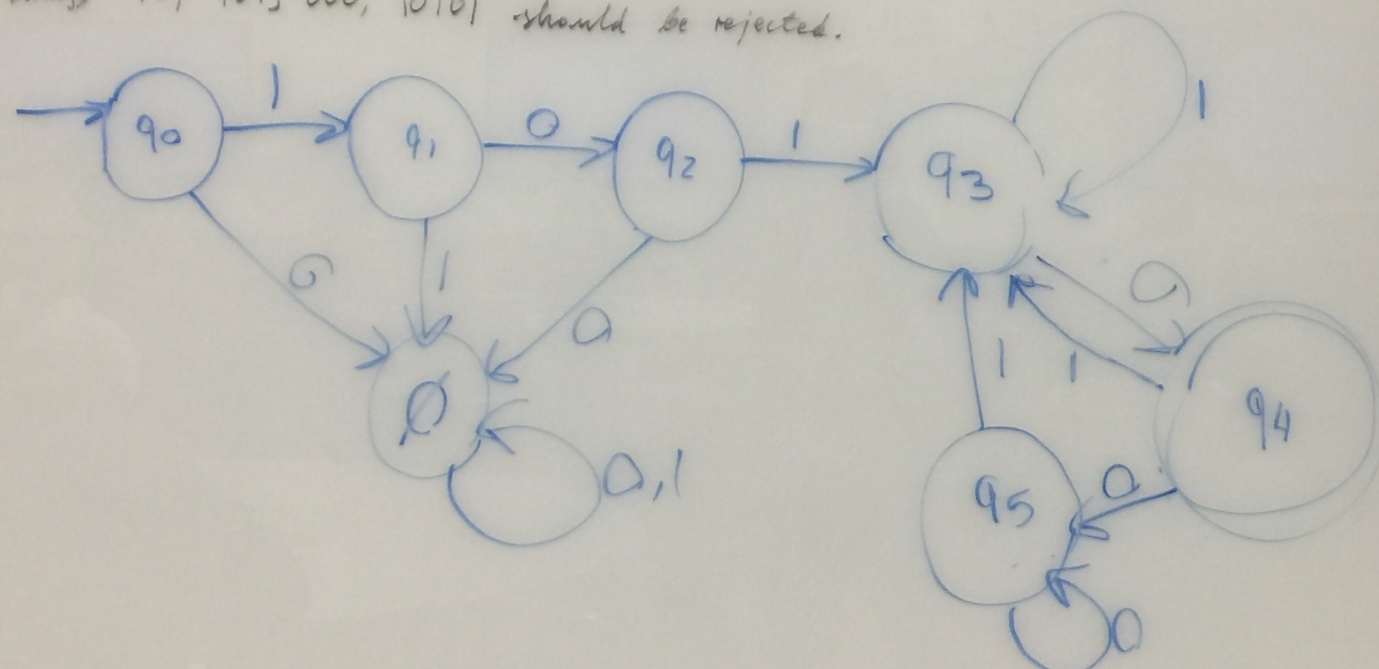
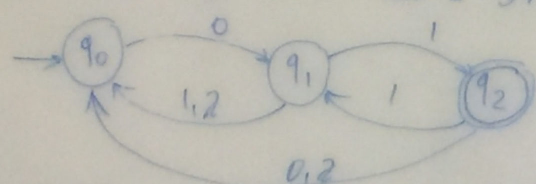
Prefix:101
Suffix:10
We create a new string is 1010 first! because 1010 is the first string and it cannot be simplified!
then try create a 10110 or 101010. We can use states as much as you want.

1. Find a DFA that accepts the set of all strings on $\Sigma = \{0, 1\}$ starting with the prefix 101 and ending with the suffix 10. For example, strings 1010, 10110, 101010 should be accepted, strings 10, 101, 000, 10101 should be rejected.



NFA—>DFA
1)two questions
2)find or calculate walking states
3)careful lambada.
4)Draw a state graph

Convert the following NFA into a DFA



a) find $\delta(q_0,0)$, $\delta(q_0,1)$, $\delta(q_1,0)$, $\delta(q_1,1)$, $\delta(q_2,0)$ and $\delta(q_2,1)$

b) convert NFA into DFA

$\delta(q_0,0)=\{q_0,q_1\}$

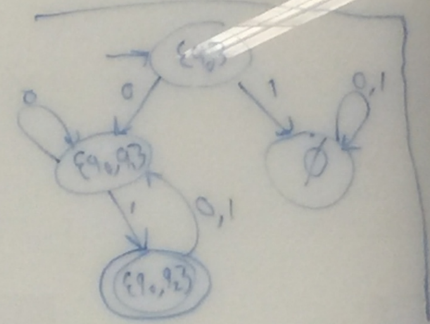
$\delta(q_0,1)=\emptyset$

$\delta(q_1,0)=\{q_0,q_1\}$

$\delta(q_1,1)=\{q_0,q_2\}$

$\delta(q_2,0)=\{q_0,q_1\}$

$\delta(q_2,1)=\{q_0,q_1\}$



3. Minimize the following DFA. Use the k-equivalence algorithm.

0-equivalence

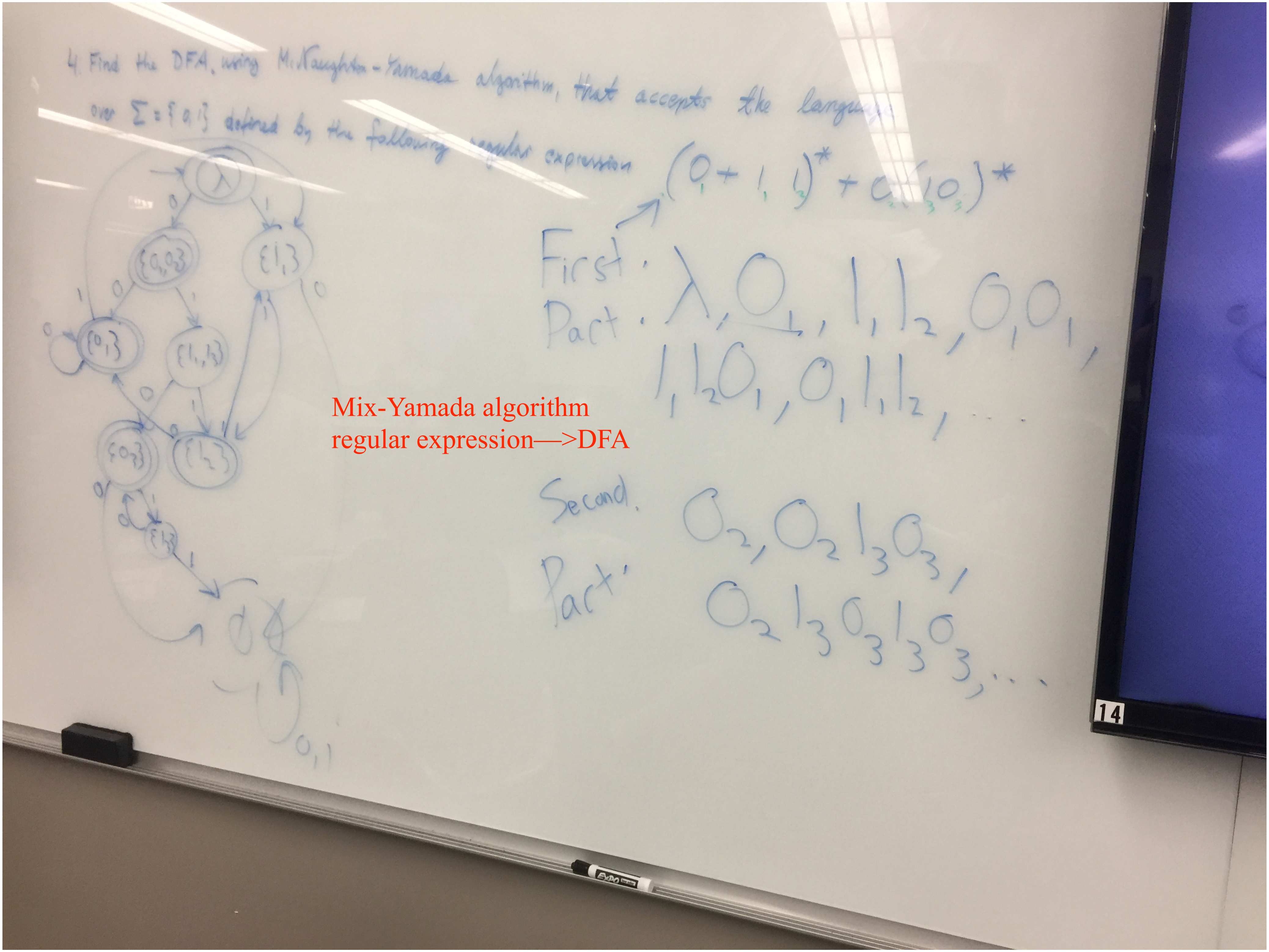
	0	1	Final state
q_0	q_2	q_3	no
q_1	q_2	q_3	no
q_2	q_3	q_1	yes
q_3	q_4	q_0	yes
q_4	q_5	q_5	no
q_5	q_5	q_5	no

1-equivalence

		0	1
a	q_0	q_{2b}	q_{3b}
	q_1	q_{2b}	q_{3b}
	q_4	q_{5a}	q_{5a}
	q_5	q_{5a}	q_{5a}
b	q_2	q_{3b}	q_{1a}
	q_3	q_{4a}	q_{0a}

2-equivalenc

		0	1
a	q_0	q_{2c}	q_{3d}
	q_1	q_{2c}	q_{3d}
b	q_4	q_{5b}	q_{5b}
	q_5	q_{5b}	q_{5b}
c	q_2	q_{3d}	q_{1a}
d	q_3	q_{4b}	q_{0a}



Mix-Yamada algorithm
regular expression—>DFA