MINIMIZATION ALGORITHM

1. WRITE TABLE OF ALL PAIRS $\{p, q\}$ INITIALLY UNMARKED

2. MARK $\{p, q\}$ IF $p \in F$ AND $q \notin F$ OR VICE VERSA

3. REPEAT ^FOLLOWING STEPS UNTIL NO CHANGES

IF THERE EXISTS $\{p, q\}$ SUCH THAT FOR SOME a $\{\delta(p,a), \delta(q,a)\}$ IS MARKED THEN MARK $\{p, q\}$.

WHEN DONE $p \equiv q$ iff $\{p, q\}$ IS NOT MARKED

THM

WE ARE MARKING STATE PAIRS THAT CAN NOT BE EQUIVALENT.

$\binom{n}{2}$ POSSIBLE MARKS $O(n^2)$

'EXAMPLE

A

	a	b
→ 0	1	2
1F	3	4
2F	4	3
3	5	5
4	5	5
5F	5	5

	a	b
[0]	[1]	[1]
[1]F	[3]	[3]
[3]	[5]	[5]
[5]F	[5]	[5]

0

1 — 1

2 — — 2

— 4 — 6 — 3

— 5 — 7 — ~~8~~ — 4

3 — X_1 — X_2 — 8 — 9 — 5

$\{0,3\} \xrightarrow{a} \{1,5\}$ NOT MARKED

$\{0,3\} \xrightarrow{b} \{2,5\}$ NOT MARKED

$\{0,4\} \xrightarrow{a} \{1,5\}$ NOT MARKED

$\{0,4\} \xrightarrow{b} \{2,5\}$ NOT MARKED

$\{1,2\} \xrightarrow{a} \{3,4\}$ " "

$\{1,2\} \xrightarrow{b} \{4,3\}$ " "

$\{1,5\} \xrightarrow{a} \{3,5\}$ MARKED SO MARK $\{1,5\}$ x_1

$\{2,5\} \xrightarrow{a} \{4,5\}$ MARKED SO MARK $\{2,5\}$ ×2

$\{3,4\} \xrightarrow{a,b} \{5,5\}$ ~~MARKED~~
NOT IN TABLE

0				
✓	1			
✓	✓	2		
1	✓	✓	3	
2	✓	✓	✓	4
✓	✓	✓	✓	✓ 5

$\{0,3\} \xrightarrow{a} \{1,5\}$ NOW MARKED SO MARK $\{0,3\}$

$\{0,4\} \xrightarrow{a} \{1,5\}$ " $\{0,4\}$

$\xrightarrow{b} \{3,5\}$ "

$\{1,2\} \xrightarrow[b]{a} \{3,4\}$ UNMARKED

$\{3,4\} \xrightarrow[b]{a} \{5,5\}$ UNMARKED

SO

$1 \sim 2$

AND $3 \sim 4$

EXAMPLE B

	a
0	1
1F	2
2	3
3	4
4F	5
5	0

	a
[0]	[1]
[1]	[2]
[2]	[3]=[0]

0
✓ 1
x ✓ 2
— ✓ x 3
✓ — ✓ ✓ 4
x ✓ — x ✓ 5

0, 2 → 1, 3 M
0, 3 → 1, 4
0, 5 → 1, 0 M
1, 4 → 2, 5
2, 3 → 3, 4 M
2, 5 → 3, 0
3, 5 → 4, 0 M

ANOTHER PASS NO CHANGE SO

0 ≈ 3 1 ≈ 4
2 ≈ 5