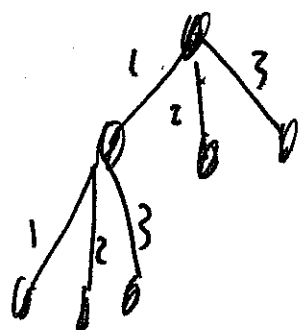


nondeterministic TM construction

①

- 1) tape 1 : original input
- 2) tape 2 : simulate the machine with the input
- 3) tape 3 : keep track of the breadth-first search



ε
1
2
3
11
12
13
21

single tape transition function

(2)

$$\delta: Q \times \Gamma \rightarrow Q \times \Gamma \times \{L, R\}$$

e.g. $\delta(q_3, 0, 1, 0) \rightarrow (q_4, 0, 1, 1, R, R, R)$

3 state machine

tape 1

0	1	1	...
---	---	---	-----

tape 2

1	1	1	1	...
---	---	---	---	-----

tape 3

1	1	...
---	---	-----

multi-tape
equivalence

1 state machine

tape

#	0	1	#	1	1	1	#	1	#
tape 1			tape 2				tape 3		

(3)

tape # x 0 | # x | | | # x | # option 1

tape # a | # b | | # b # option 2

a = 0 b = 1

$\{L, R, S\} \xrightarrow[\text{with}]{\text{simulate}} \{L, R\}$

$\delta(q_i, x) \rightarrow (q_j, y, L) \quad \times$

$\rightarrow (q_j, y, R) \quad \times$

$\rightarrow (q_j, y, S)$

$\rightarrow (q_{j_1}, x, R) \quad \times$
 $(q_{j_2}, y, L) \quad \times$

④

$$\delta(q_i, x) \rightarrow \underline{(q_{j1}, y, R)}$$

new state

$$\delta(q_{j1}, *) \rightarrow (q_i, *, L)$$

* = anything