

Finite Automata

Input: String over an alphabet

↳ finite set of chars

Vending machine: N: insert nickel
D: insert dime
Q: insert quarter.
G: purchase gumball.

Set of states: finite set of states.
Automaton is in one of these states
at each moment.

Vending machine: 0, 1, 2, 3, 4, 5

State i : 5i cents credit

Output: String over a finite alphabet.

r: return last coin entered.
m: message "not enough \$"
g: dispense gumball
n: do nothing.

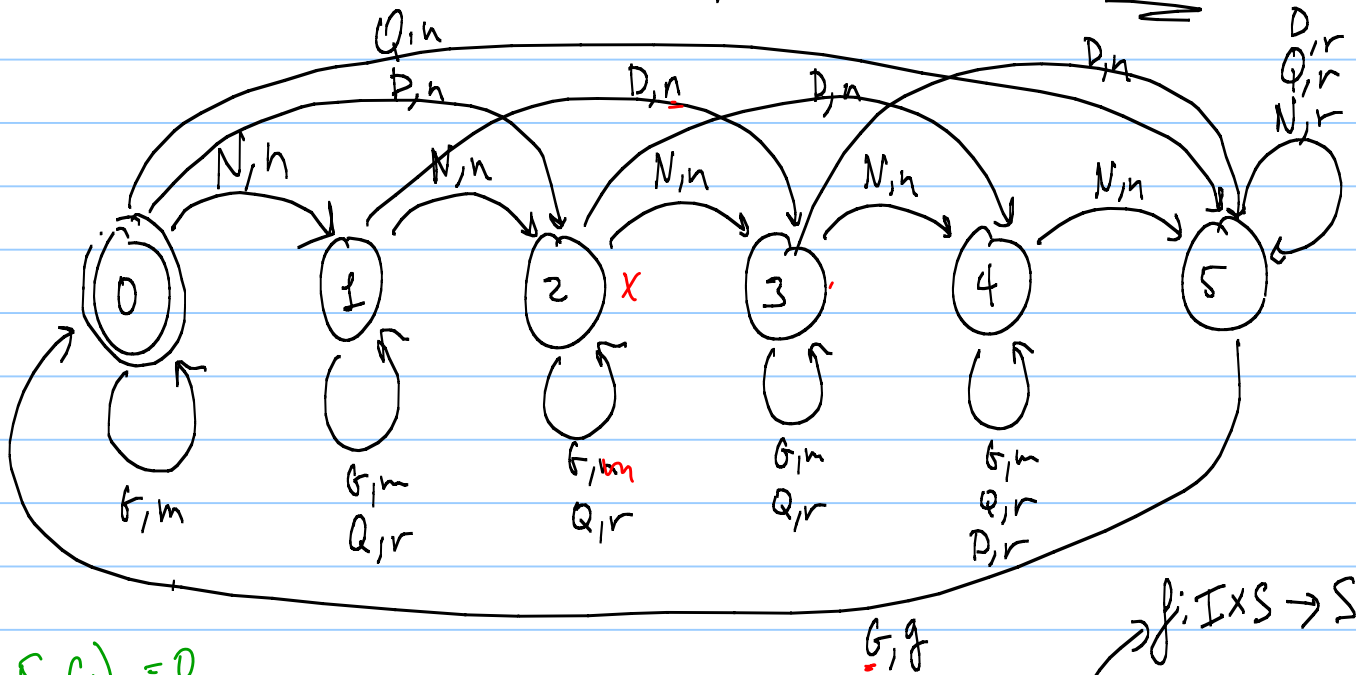
State diagram.

N Q G D D G D G

n r m n n g n m

Vertices $\Leftrightarrow$ states,

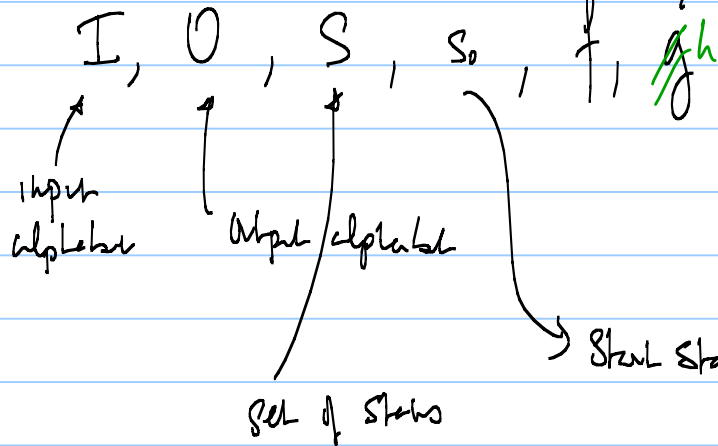
Stack state



$$y(S, G) = 0$$

$$h(S, G) = g$$

Finite Automaton:



$$f(S, G) =$$

		↓	↓	State.			
	f	0	1	2	3	4	5
N		1	2	3	4	5	5
→ D		(2)	3	4	5	4	5
Q		5	1	2	3	4	5
G		0	1	2	3	4	0