Finite Automata – Vending Machine Example

Inputs (as symbols)
N – nickel inserted
D – dime inserted
G – gum selected
J – jelly beans selected

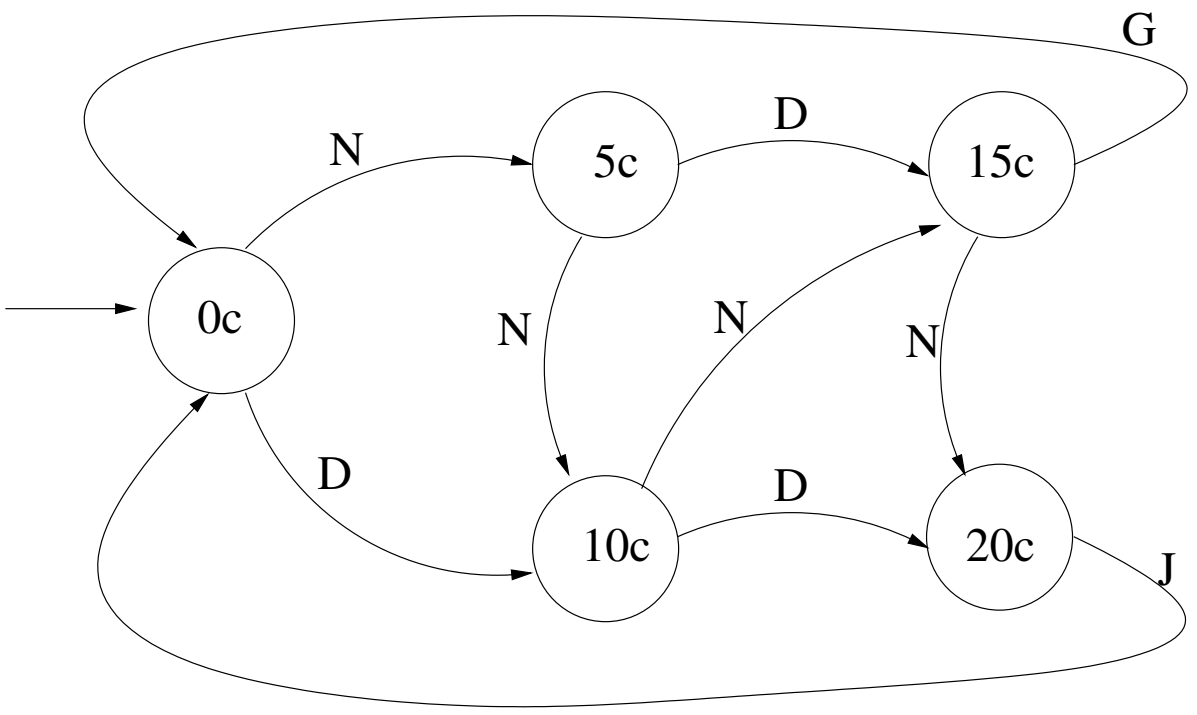
Outputs (as symbols)
g – gum dispensed
j – jelly beans dispensedf
5 – 5 cents change
10 – 10 cents change
b – beep sound

Additional Specifications
gum will always cost 15 cents
jelly beans will always cost 20 cents
infinite supply of product and coins (K.I.S.S.)

Finite number of states: Machine must only remember how much money inserted so far.

Q = { 0c, 5c, 10c, 15c, 20c }

State Transition Diagram



State Transition Table

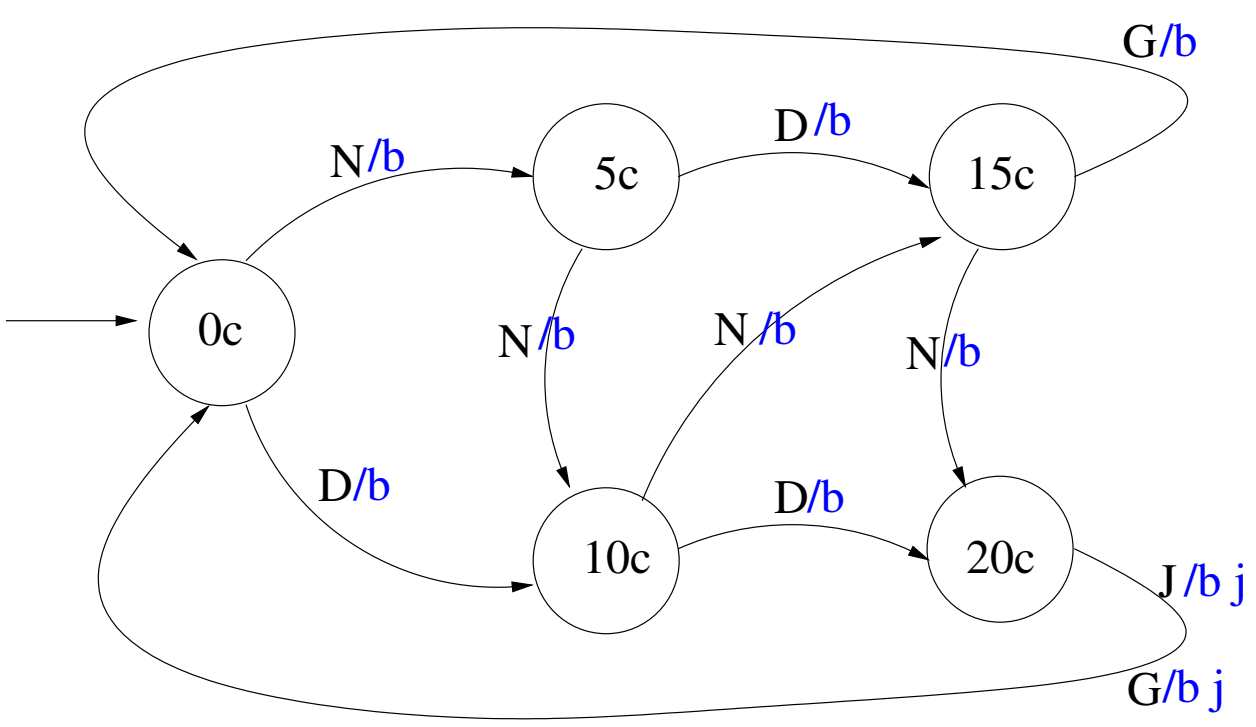
	N	D	G	J
0c	5c	10c		
5c	10c	15c		
10c	15c	20c		
15c	20c	20c	0c	
20c	20c	20c	0c	0c

Each state must have a transition for every input!

Complete the table (andor diagram)

State Transitions are a function. State x Input_Symbol –> State

Finite State Transducer: a finite state machine with outputs
Mealy Machine: a finite state trasnducer with an output on each edge



Output table

	N	D	G	J
0c	b	b		
5c	b	b		
10c	b	b	b g	
15c	b			b j
20c				

Each state must have an output for every transition

Complete the table (and/or diagram)

Outputs are a function. State x Input_Symbol –> Output_Symbol