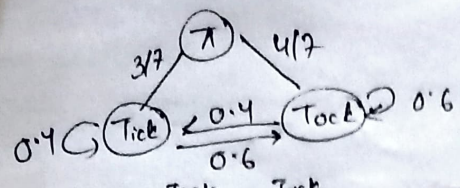
CS 302 AI
Quiz 5

Dipsan Dasgupta
202151188

Soln

(a).



i) π = [Tick Tock] = [3/7 4/7]

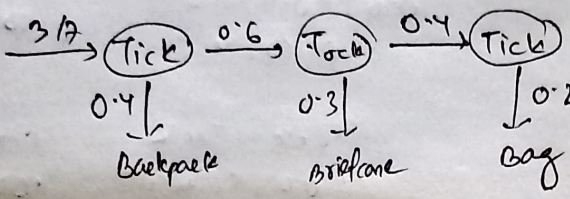
(ii) State transition

	Tick	Tock
Tick	0.4	0.6
Tock	0.4	0.6

(iii) Symbol emission prob.

	Briefcase	Backpack	Bags
Tick	0.4	0.4	0.2
Tock	0.3	0.3	0.4

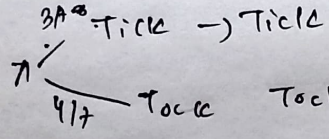
(b)



$P(T_i, T_o, T_i, B_p, B_c, B_g \mid Model) = (3/7)(0.4)(0.6)(0.3)(0.4)(0.2)$

$= 0.00246$

(c)



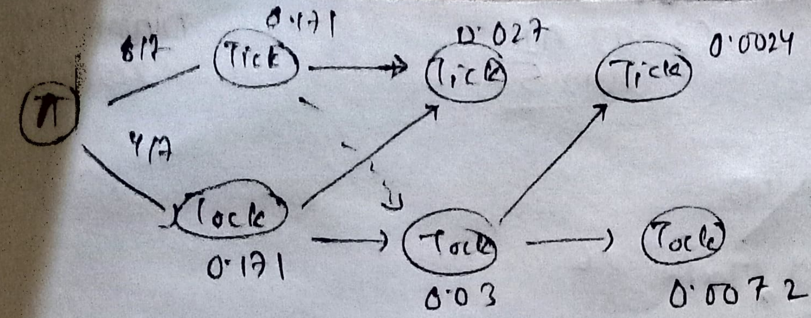
$\alpha_0(\text{Tick}) = 3/7 \times 0.4 = 0.171$ | $\alpha_0(\text{Tock}) = 4/7 \times 0.3 = 0.171$

$\alpha_1(\text{Tick}) = (0.171 \times 0.4 + 0.171 \times 0.4) \times 0.4 = 0.054$ | $\alpha_1(\text{Tock}) = (0.171 \times 0.6 + 0.171 \times 0.6) \times 0.3 = 0.061$

$\alpha_2(\text{Tick}) = (0.054 \times 0.4 + 0.061 \times 0.4) \times 0.2 = 0.0092$ | $\alpha_2(\text{Tock}) = (0.054 \times 0.6 + 0.061 \times 0.6) \times 0.4 = 0.0276$

Total = $0.0092 + 0.0276 = 0.0368$

d)



Order: Backpack → Briefcase → Bag

V_0 (Tick) = 0.171 . V_1 (Tock) = 0.171

for V_1,

Tick → Tick
0.171 x 0.4 x 0.4
= 0.027

Tock → Tick
0.171 x 0.4 x 0.4
= 0.027.

Comparing max
~~Adding~~ = 0.027
~~= 0.027 + 0.027~~

Tick → Tock
0.171 x 0.6 x 0.3
= 0.030

Tock → Tock
0.171 x 0.6 x 0.3
= 0.030

Compairing
= 0.03

for V_2,

Tick → Tick
= 0.027 x 0.4 x 0.2
= 0.00216

Tock → Tick
0.03 x 0.4 x 0.2
= 0.0024.

comparing
= 0.0024 .

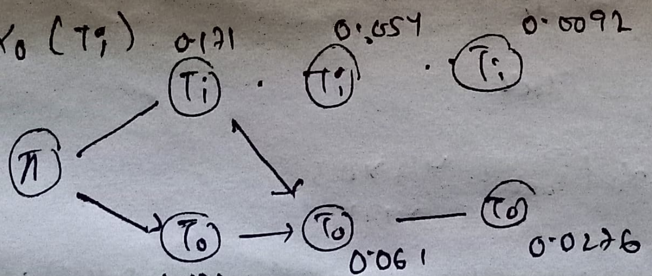
Tick → Tock
0.027 x 0.6 x 0.4
= 0.00648

Tock → Tock
= 0.03 x 0.6 x 0.4
= 0.0072

comparing
.0072

So, sequ is: Ti → To → To
To → To → To

e) α_0 (T_i)



Ms. Gaun b.f.

In both DP seme & HMM. well seen, ~~is~~ handled by Tock (To)

~~To → To → To~~