

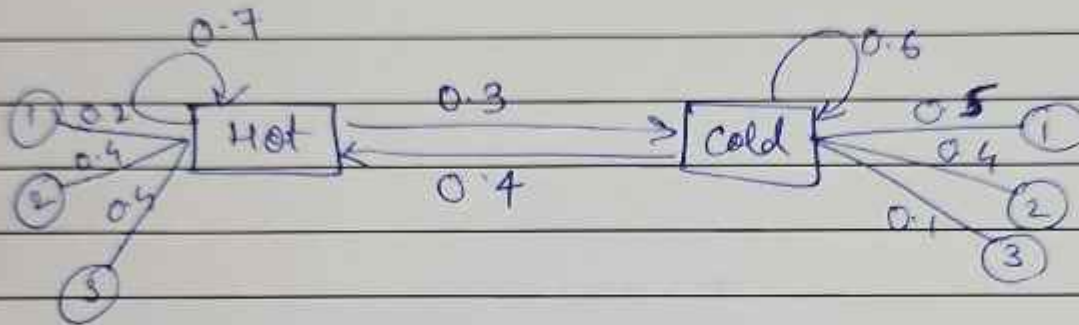


Semester : _____

Subject : _____

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[ICE - CREAM PROBLEM]



Some person is sitting inside the home. He is not able to identify whether it is ~~inside~~ hot or cold outside.

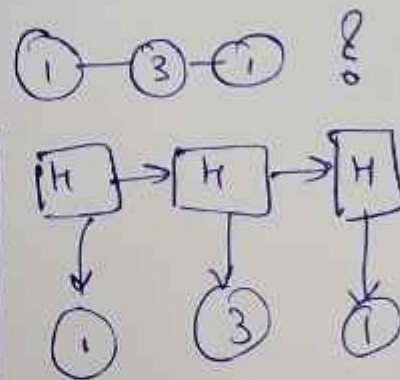
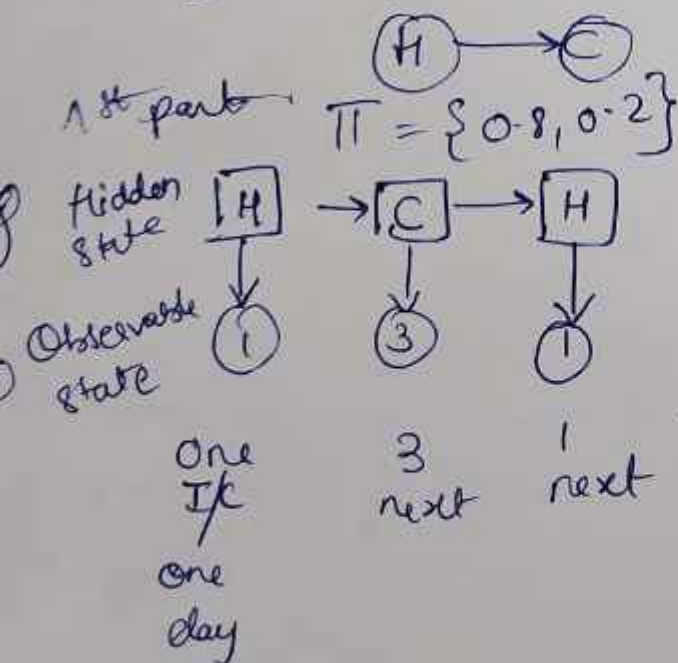
But, (some person) John observed, that he is eating ①, ② or ③ icecream per day. On this observation, he is trying to find out whether it is hot / cold outside.



		Transition Matrix		future state
		Hot	Cold	
Current state	Hot	0.7	0.3	= 1
	Cold	0.6	0.4	= 1

	Emission Matrix		
	①	②	③
Hot	0.2	0.4	0.4
Cold	0.5	0.4	0.1

2 hidden states



M combinations



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$N = \text{No of hidden state} = 2$

$T = \text{Given no of observation} = 3$

HCC

HCH

HHC

CCC

HHH

CHH

$M = N^T = 2^3 = 8 \text{ combinations}$

Joint probability,

$$P(a, b) = P(a|b) P(b)$$

$$P(1, H) = P(1|H) P(H)$$

Normalizing with same

$$P(0, \emptyset) = P(0|\emptyset) P(\emptyset)$$

$$P(1, 3, 1, H, C, H) = \left[P(1|H) P(3|C) P(1|H) \right] \text{From Expt 1}$$

H initial weaker

$$\left[P(H) P(C|H) P(H|C) \right] \text{From TMaking}$$

$P(H) = 0.8$
 $P(C) = 0.2$

$$= 0.2 \times 0.1 \times 0.2 \times$$

$$0.8 \times 0.3 \times 0.6$$

$$0.000576$$

$$= \text{~~0.000576~~} \Rightarrow P_1$$



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$$P(O, Q) = \prod P(o_i | q_i) \prod (a_{i-1} | q_i)$$

P_1

P_2

P_3

P_4

P_5

P_6

P_7

P_8

$\text{Max}(P_1, \dots, P_8) =$ ^{determines} what hidden sequence would be there.