Sai Ram.K.   5-CSE-10
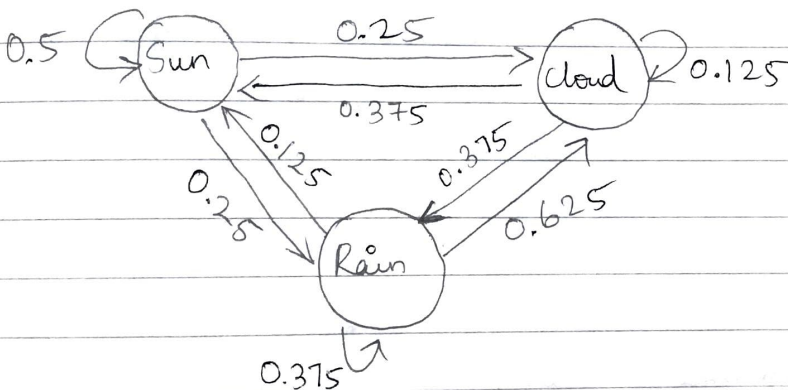
2018ICSE0621

06/01/21

Part - C.

Q.2) a)

		Weather today		
		Sun	Cloud	Rain
Weather Yesterday	Sun	0.5	0.25	0.25
	Cloud	0.375	0,125	0.375
	Rain	0.125	0.625	0.375

→ Transition diagram :-

→ Probability of 5 consecutive raining days.

Let Today be a rainy day

Let S_1 : Sun, S_2 : Cloud, S_3 : Rain.

Let today be wednesday.

Wednesday	Thursday	Friday	Saturday	Sunday	Monday
Rainy	Rainy	Rainy	Rainy	Rainy	Rainy

$\Rightarrow 1 \times P(S_3|S_3) \times P(S_3|S_3) \times P(S_3/S_3) \times P(S_3|S_3) \times P(S_3|S_3)$

$= 1 \times 0.375 \times 0.375 \times 0.375 \times 0.375 \times 0.375$

∴ Probability of next 5 consecutive raining days $= 7.41 \times 10^{-3}$

Q.2 b] Hidden Markov model :-
This is a statistical Markov model in which the system being modeled is assumed to be a markov process with unobserved or hidden states.

*   Notation : $\lambda = (A, B, \Pi)$

(I)   N : Number of States
~~(II) M : Number of observable states~~
(II)   M : Number of Symbols observable in states
(III) A : State transition probability distribution
       $A = \{a_{ij}\}$ $1 \leq i, j \leq N$
(IV)   B : Observation symbol prob. distribution
       $B = \{b_i(v_k)\}$ $1 \leq i \leq N, 1 \leq j \leq M$.
(V) Π : Initial state distribution
       $\Pi_i = p(q_1 = i)$ $1 \leq i \leq N$

*   They are known for applications in reinforcement learning, temporal pattern recognition such as speech, handwriting gesture recognition, parts of speech tagging musical sure following partial discharges & ~~bio~~ bioinformatics.

*   Also for solving probability of given sequence, decoding & learning.