UNIVERSITY OF ASIA PACIFIC

DEPT OF CSE

18101009

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A SECTION

4TH YEAR 1ST SEMESTER

CLASS TEST - 3

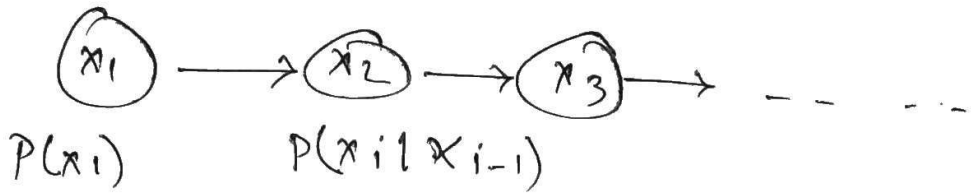
CSE-403

18101009.

Ans: 1

Markov model is a stochastic model used to model pseudo randomly changing system. which assumes future states depends ~~not~~ on the current state. This assumption enables reasoning & computation with the model

Here, value of x at a given time called states.



Parameters: called transition probabilities or dynamics specifies how the state evolves over time.

Stationary assumption: ~~time~~ transition probabilities the same at all times.

Joint distribution.

$$P(x_1, x_2, x_3, x_4) = P(x_1)\, P(x_2|x_1)\, P(x_3|x_2)\, P(x_4|x_3)$$

Chain Rule: $P(x_1, x_2, x_3, x_4) = P(x_1) P(x_2|x_1) P(x_3|x_1, x_2) P(x_4|x_1, x_2, x_3)$

18/01/09

Implied conditional independencies..

$X_3 \perp X_1 | X_2 \;\&\; X_4 \perp X_1, X_2 | X_3$

These are those assumption to make markov model possible.

1801009

Ans: 2

Id = 1801009

last 2 dig = 09

So, here

A = 09/100 = 0.09

B = 1 - 0.09 = 0.91

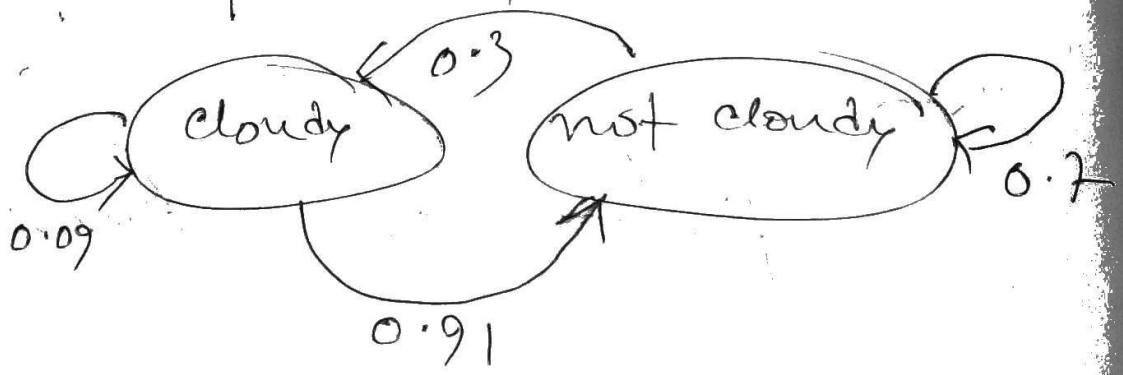
D = SQRT(09)/10 = 0.3

C = 1 - 0.3 = 0.7

Monday

Table

Tue	Next (wed)	Probability
cloudy	cloudy	0.09
cloudy	not cloudy	0.91
not cloudy	cloudy	0.3
not cloudy	not cloudy	0.7



let,

x_1 = Tue.

x_2 = wed.

Need To calc = $P(X_2 = \text{not cloudy})$

18/01/09

Q2

From markov chain we get

~~$P(x_1) =$~~

$P($cloudy$|$ wed$)$

$= (0.09 * 0.91) + (0.3 * 0.7)$

$= 0.0819 + 0.21 = 0.2919$

~~$P(X_2 = \text{cloudy}) \cdot x_2 = x_0$~~

$P(X_2 = \text{cloudy} \mid x_2 = \text{cloudy} \cdot P(x_1 = \text{cloudy}) +$

$P(X_2 = \text{cloudy} \mid x_1 = \text{not cloudy}) = P(x_2 = \text{not cloudy})$

$(0.09 * 0.91) + (0.3 * 0.7)$

$= 0.2919$ (Ans)

$P(X_2 = \text{Not cloudy}) = 0.2917$ (Ans)