

CSE
535

9/26/17

Start
9 steps

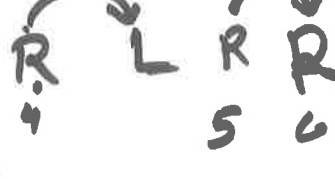
$C_{R \rightarrow L}$
1

①
 $C_{R \rightarrow R}$
1

$C_{R \rightarrow L}$
2

$C_{R \rightarrow L}$
3

$C_{R \rightarrow R}$
2



$$P(R|R) = \frac{C_{R \rightarrow R}}{C_R}$$

$$P(L|R) = \frac{C_{R \rightarrow L}}{C_R}$$

200 steps



$$\frac{C_{L \rightarrow L}}{C_L} = P(L|L)$$

$$P(R|L) = \frac{C_{L \rightarrow R}}{C_L}$$

$C_{R \rightarrow L}$ = cases when the person took a right step (current state) and then took a left

C_R = cases when the person took a right step.

$$P(L|R) = \text{probability that you take a left step next given that your current step was R}$$

$$= \frac{C_{R \rightarrow L}}{C_R}$$

(2)

$$P(\text{2nd step is L} | R)$$

$$= P(R|R)P(L|R) + P(L|R)P(L|L)$$

$$A_{Tr} = \begin{bmatrix} P(R|R) & P(L|R) \\ P(R|L) & P(L|L) \end{bmatrix}$$

$$A_{Tr}^2 = A_{Tr} \times A_{Tr}$$

$$= \begin{bmatrix} P(R|R)^2 + P(R|L)P(L|R) & P(R|R)P(L|R) + P(R|L)P(L|L) \\ P(R|R)P(R|L) + P(R|L)P(L|L) & P(L|R)P(R|L) + P(L|L)^2 \end{bmatrix}$$

(3)

$$A_{Tr} = \begin{bmatrix} 0.4 & 0.6 \\ 0.3 & 0.7 \end{bmatrix}$$

$$A_{Tr}^2 = \begin{bmatrix} 0.34 & 0.66 \\ 0.33 & 0.67 \end{bmatrix}$$

$$A_{Tr}^3 = \begin{bmatrix} 0.334 & 0.666 \\ 0.333 & 0.667 \end{bmatrix}$$

$$A_{Tr}^4 = \begin{bmatrix} 0.3334 & 0.6666 \\ 0.3333 & 0.6667 \end{bmatrix}$$