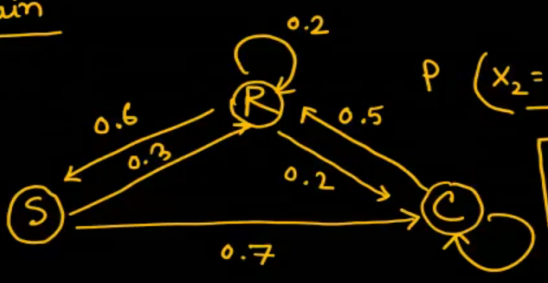
Markov Chain



$P(X_2 = \text{"S"} \mid X_1 = \text{"R"}) = 0.6$

$P(X_{n+1} = \text{"x"} \mid X_n = \text{"}x_n\text{"})$ — Markov chain

" Future state only depends on the current state, not the states before

Naive Bayes

$P(X_{n+1} = \text{"x"} \mid X_1 = \text{"}x_1\text{"}, X_2 = \text{"}x_2\text{"}, \ldots, X_n = \text{"}x_n\text{"})$

$$A = \begin{array}{c} \\ R \\ S \\ C \end{array} \begin{array}{c} \begin{array}{ccc} R & S & C \end{array} \\ \begin{bmatrix} 0.2 & 0.6 & 0.2 \\ 0.3 & 0 & 0.7 \\ 0.5 & 0 & 0.5 \end{bmatrix} \end{array}$$

Transition Matrix

$\pi_0 = [0 \quad 1 \quad 0]$

$\pi_1 = \pi_0 A = [0 \quad 1 \quad 0] \begin{bmatrix} 0.2 & 0.6 & 0.2 \\ 0.3 & 0 & 0.7 \\ 0.5 & 0 & 0.5 \end{bmatrix}$

$= [0.3 \quad 0 \quad 0.7]$

$\pi_2 = \pi_1 A$

$= [0.3 \quad 0 \quad 0.7] [A]$

$\pi_2 = [0.41 \quad 0.18 \quad 0.41]$

$\pi_n A = \pi_n$ [Equilibrium State]