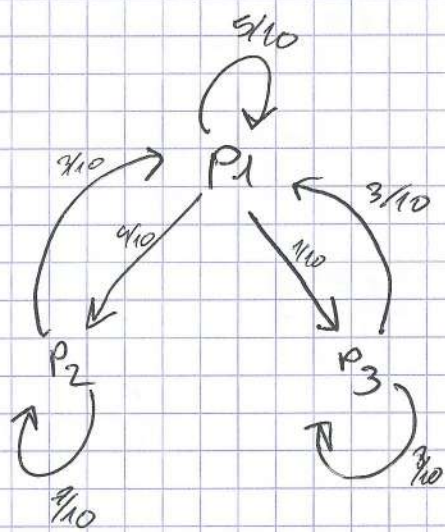


02/02/16

TD Teller

TD : Markov (1)

ex 5 p 18



$$P = \begin{pmatrix} 5/10 & 4/10 & 1/10 \\ 4/10 & 4/10 & 0 \\ 3/10 & 0 & 4/10 \end{pmatrix}$$

$$\pi_0 = \left(\frac{3}{10}, \frac{5}{10}, \frac{2}{10} \right)$$

$$\begin{cases} \pi^* P = \pi^* \\ \sum \pi_i^* = 1 \end{cases}$$

$$\pi_1 = \pi_0 \cdot P$$

$$\pi_2 = \pi_0 \cdot P^2$$

$$\begin{cases} (x_1, x_2, x_3) \begin{pmatrix} 5/10 & 4/10 & 1/10 \\ 4/10 & 4/10 & 0 \\ 3/10 & 0 & 4/10 \end{pmatrix} = (x_1, x_2, x_3) \\ x_1 + x_2 + x_3 = 1 \end{cases} \Leftrightarrow \begin{cases} 5x_1 + 3x_2 + 2x_3 = 10x_1 \\ 4x_1 + 9x_2 = 10x_2 \\ x_1 + 8x_3 = 10x_3 \\ x_1 + x_2 + x_3 = 1 \end{cases}$$

$$\pi_{\infty} = \begin{pmatrix} x_1 & x_2 & x_3 \\ x_1 & x_2 & x_3 \\ x_1 & x_2 & x_3 \\ \vdots & \vdots & \vdots \end{pmatrix}$$

$$\Pi_0 \rightarrow \Pi^*$$

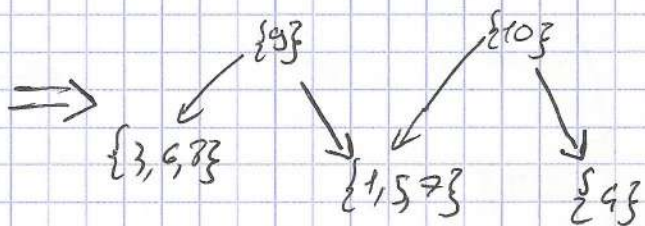
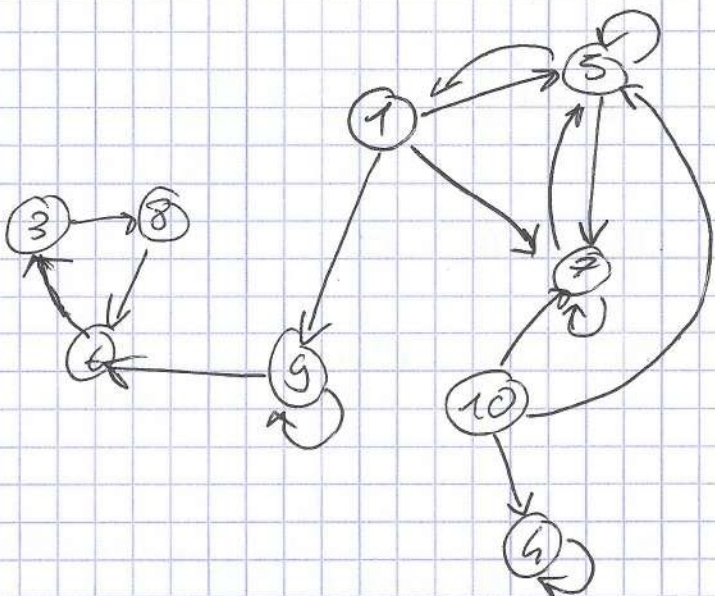
$$\left(\frac{1}{10}, \frac{1}{10}, \frac{3}{10}\right) \begin{pmatrix} x_1 & x_2 & x_3 \\ x_1 & x_2 & x_3 \\ x_1 & x_2 & x_3 \end{pmatrix}$$

$$\Pi \text{ } \tau_b = \left(\frac{1}{10}, \frac{1}{10}, \frac{3}{10}\right)$$

$$\Pi_i \xrightarrow{?} \Pi^* \text{ lim!}$$

$$= (x_1, x_2, x_3)$$

$\{2\}, \{3, 6, 8\}, \{10\}, \{4\}, \{9\}, \{1, 5, 7\}$



$$\begin{cases} (x_1, x_2, x_3) \begin{pmatrix} 0 & 1/4 & 3/4 \\ 1/2 & 1/6 & 1/3 \\ 0 & 3/4 & 1/4 \end{pmatrix} = (x_1, x_2, x_3) \begin{cases} \frac{1}{2}x_2 = x_1 \\ \frac{1}{4}x_1 + \frac{1}{6}x_2 + \frac{3}{4}x_3 = x_2 \\ \frac{3}{4}x_1 + \frac{1}{3}x_2 + \frac{1}{4}x_3 = x_3 \\ x_1 + x_2 + x_3 = 1 \end{cases} \end{cases}$$

$$\begin{aligned} x_1 \left(\frac{1}{4} + \frac{1}{4} - 2\right) + \frac{3}{4}x_3 &= 0 \\ x_1 \left(-\frac{13}{4}\right) &= -\frac{3}{4}x_3 \\ x_3 &= \frac{4 \cdot 13}{3 \cdot 12} = \frac{13}{9} \end{aligned}$$

$$\begin{aligned} x_1(1 + 2 + \frac{13}{9}) &= 1 \\ x_1 \left(\frac{44}{9}\right) &= x_1 = \frac{9}{44} \\ x_2 &= \frac{18}{44} \\ x_3 &= \frac{19}{44} \times \frac{9}{44} = \frac{171}{1936} \end{aligned}$$

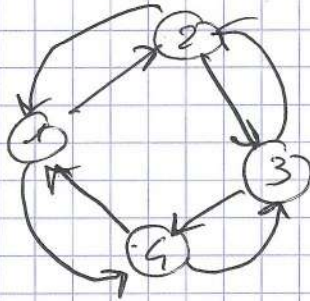
$$\rightarrow \begin{pmatrix} 9 & 18 & 171 \\ \frac{1}{44} & \frac{18}{44} & \frac{171}{44} \end{pmatrix}$$

02/04/16

TD Tella

TD: Markov (2)

ex 6 p 18:



~~ex 6~~

$$Q^2 = \begin{pmatrix} 1/2 & 0 & 1/2 & 0 \\ 0 & 1/2 & 0 & 1/2 \\ 1/2 & 0 & 1/2 & 0 \\ 0 & 1/2 & 0 & 1/2 \end{pmatrix}$$

