What is a marginal distribution?

$$\mu_n(i) = P(X_n = i)$$

↑ prob.

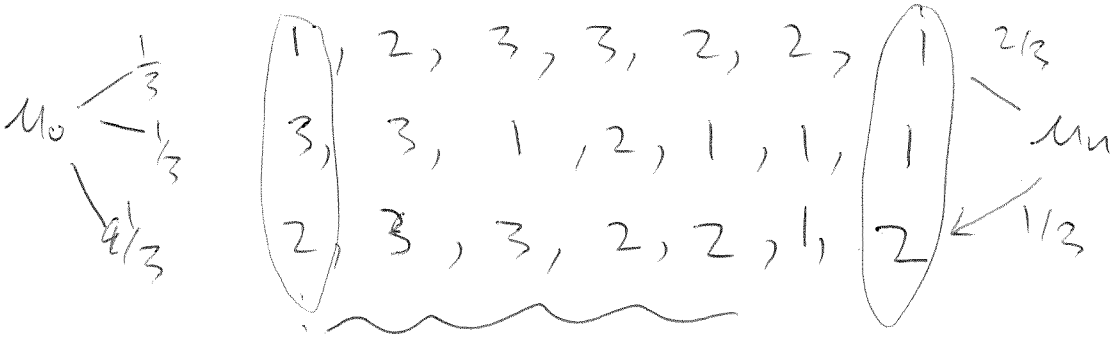
Meaning?

matrix

$$\mu_n = \mu_0 P^n$$ ← use this

↓ interpretation (intuition).

Realisations



lots of realisations

$\mu_0 = (1/3\ \ 1/3\ \ 1/3)$

$x = 1\ \ 2\ \ 3$

prob of starting from each state.

$\xrightarrow{P^n}$

$\mu_n = (2/3, 1/3, 0)$

$x = (1\ \ 2\ \ 3)$

prob of being in each state after n steps

Expected Value

$x=$	1	2	3	4	5
$v=$	1	5	3	2	10
$\pi=$	$\frac{1}{10}$	$\frac{2}{10}$	$\frac{3}{10}$	$\frac{3}{10}$	$\frac{1}{10}$

$$E[V] = \pi V^T = 1\times\frac{1}{10} + \frac{5\times 2}{10} + \frac{3\times 2}{10} + \dots$$

$$\begin{bmatrix} 1/3 & 1/3 & 1/3 \\ \cdot & \cdot & \cdot \\ 1/3 & 1/3 & 1/3 \end{bmatrix}$$