left_prods I W_3 W_3W_2 $W_3W_2W_1$ $W_3W_2W_1$

right_prods I W_1 W_2W_1 $W_3W_2W_1$ $W_3W_2W_1$

$$\frac{\frac{Y}{n} - p}{\sqrt{\frac{p(1-p)}{n}}} = \frac{\frac{Y-np}{n}}{\frac{\sqrt{p(1-p)}}{\sqrt{n}}}$$

$$= \frac{Y-np}{n} \cdot \frac{\sqrt{n}}{\sqrt{p(1-p)}}$$

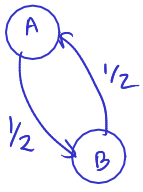
$$= \frac{Y-np}{\sqrt{np(1-p)}}$$

$$\frac{X - E[X]}{\sqrt{Var(X)}} \sim \mathcal{N}(0,1) \qquad \mathcal{N}(\mu, \sigma^2)$$

$$X \sim \mathcal{N}(E[X], Var(X))$$

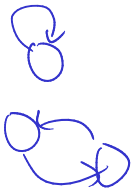
□ –

$\pi_0 = [1/2 \;\; 1/2]$



$\pi = [1/2 \quad 1/2]$

$Pr[X_{100} = A] = 1/2 = \pi(A)$

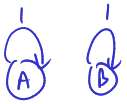


$\pi = \pi \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

$\pi(A) = \pi(B) = 1/2$

$\pi(B) = \pi(A) = 1/2$

$\pi(A) + \pi(B) = 1$



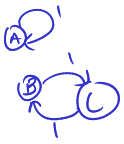
$\pi = \pi \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

$\pi(A) = \pi(A) = 0.4$

$\pi(B) = \pi(B) = 0.6$

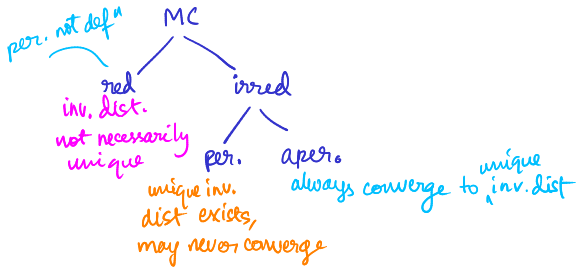
$\pi(A) + \pi(B) = 1$

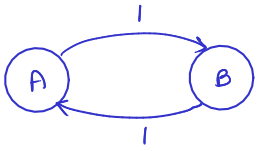
$\pi = [p \quad (1-p)] \;\; \forall p \in [0,1]$



$[p \quad \frac{(1-p)}{2} \quad \frac{(1-p)}{2}]$

$\forall p \in [0,1]$





$\pi_0 = [p \quad 1-p]$

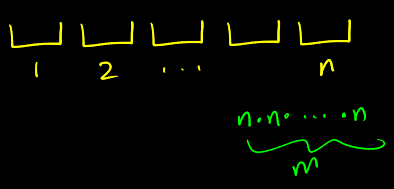
$\pi_1 = [1-p \quad p]$

$\pi_2 = [p \quad 1-p]$

$[1/2 \quad 1/2]$

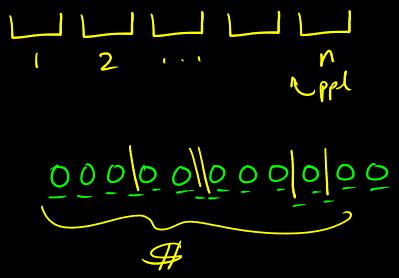
n Dist. bins, m dist. balls

$1, 2, \ldots, m$ $\quad n^m$



n Dist. bins, m non dist. balls

$00\ldots0$ $\quad \binom{m+n-1}{n-1} = \binom{m+n-1}{m}$



n non Dist. bins, m dist. balls