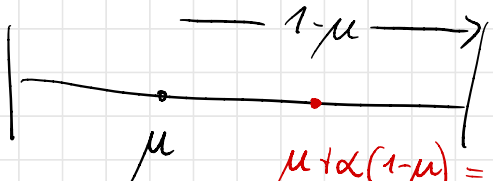
Problem:

- as the current model is too unconstrained it overfits very easily
- to regularize, we could use a markov model
  - ↳ the previous model had several problems:
    - temperature was proportional to probability of exposure $\propto \mu_{ij}$ μ_{ij}
    - ...

$z^{t-1} = 1$:



$z^{t-1} = 0$:

$\mathbb{E}[\mu_i \mu_j] = \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$ ($\frac{1}{K}$)

$$p(z_{ij}^{t} \mid z_{ij}^{t-1}) = \begin{cases} (1-\alpha)\mu_{ij} & z_{ij}^{t-1} = 0 \\ (1-\alpha)\mu_{ij} + \alpha & z_{ij}^{t-1} = 1 \end{cases}$$

$$\mathbb{E}[z] = X$$

$$\mu_{ij}$$

$$(1-\alpha)\mu_{ij} + \alpha$$

$$\mathbb{E}[\mu_{i:}^{T} \mu_{j}] = \frac{1}{K} \sum_{k=0}^{K-1} \mathbb{E}[\mu_{ik} \mu_{jk}]$$