BRUNO BORGES DE SOUZA

LISTA 4

Exercício 20.4

- Temos o Langragiano definido por:

$$L = \sum_{n=1}^{N} \langle \log P(h) \rangle_{p^{old}(h|V^n)} + \lambda\left(1 - \sum_h P(h)\right) \quad , \quad \sum_h P(h) = 1$$

↳ normalização

- Sabendo que $\langle \log P(h) \rangle_{p^{old}(h|V^n)} = \sum_x p^{old}(h = x|V^n) \log P(h = x)$,

temos que, calculando $\frac{\partial L}{\partial P(h)}$:

$$\frac{\partial}{\partial P(h)} L = \sum_{n=1}^{N} \frac{\partial}{\partial P(h)} \sum_x p^{old}(x|V^n) \log P(x) + 0 - \lambda$$

$$\frac{\partial}{\partial P(h)} L = \sum_{n=1}^{N} \frac{1}{P(h)} p^{old}(h|V^n) - \lambda$$

Fazendo $\frac{\partial}{\partial P(h)} L = 0$, tem-se:

$$\frac{1}{P(h)} \sum_{n=1}^{N} p^{old}(h|V^n) - \lambda = 0 \Rightarrow P(h) = \frac{1}{\lambda} \sum_n p^{old}(h|V^n)$$