

Exercise: Alternative derivation of the mean field updates for the Ising model

Derive the mean field updates for the Ising model (shown below) by directly optimizing the variational free energy one term at a time.

$$\mu_i^t = \tanh \left(\sum_{j \in \text{nbr}_i} W_{ij} \mu_j^{t-1} + 0.5(L_i^+ - L_i^-) \right) \quad (1)$$