Graph Cut based Inference

An energy / potential is called **submodular**
iff for every pair of variables :

$$E(0,0,\bar{\mathbf{x}}_{ij}) + E(1,1,\bar{\mathbf{x}}_{ij}) \leq E(0,1,\bar{\mathbf{x}}_{ij}) + E(1,0,\bar{\mathbf{x}}_{ij})$$

$$\arg\min_{\mathbf{x}} \sum_{i\in\mathcal{V}} c_{it}(1-x_i) + \sum_{i\in\mathcal{V}} c_{si}x_i + \sum_{i,j\in\mathcal{E}} c_{ij}(1-x_i)x_j$$

all terms submodular

submodularity – necessary condition