

Kullback-Leibler divergence

$$D_{KL}(P \parallel Q) = \sum_{x \in \mathcal{X}} P(x) \log \left(\frac{P(x)}{Q(x)} \right)$$

$$D_{KL}(P \parallel Q) = \int_{-\infty}^{+\infty} p(x) \log \left(\frac{p(x)}{q(x)} \right) dx$$

~~For uni-variate normal distributions~~

★ ~~$D_{KL}(P \parallel Q) = \log$~~

$$D_{KL} \left(\mathcal{N} \left((\mu_1, \mu_2, \dots, \mu_k)^T, \text{diag}(\sigma_1^2, \sigma_2^2, \dots, \sigma_k^2) \right) \parallel \mathcal{N}(0, I) \right)$$

$$= \frac{1}{2} \sum_{i=1}^k \sigma_i^2 + \mu_i^2 - 1 - \ln(\sigma_i^2)$$