# K-Means from EM perspective

$$q^{k+1}(t_i) = \begin{cases} 1 & \text{if } t_i = c_i \\ 0 & \text{otherwise} \end{cases}$$

$$c_i = \arg\max_c p(t_i = c \mid x_i, \theta) = \arg\min_c \|x_i - \mu_c\|^2$$

$$p(t_i \mid x_i, \theta) = \frac{1}{Z} \, p(x_i \mid t_i, \theta) \, p(t_i \mid \theta)$$

$$= \frac{1}{Z} \, \exp\left(-0.5\|x_i - \mu_c\|^2\right) \pi_c$$