1
point

1.

When $\mathcal{KL}(q||p)$ is equal to zero?

- Never.
- $p(x) = cq(x), \forall x \in X$ and different c.
- $p(x) = q(x), \forall x \in X$.

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2.

Consider true ditribution $p(x)$ which we want to approximate with some distribution $q(x)$ minimizing either forward $(\mathcal{KL}(p||q))$ or reverse $(\mathcal{KL}(q||p))$ $\mathcal{KL}$-divergence. We call *zero-forcing* the effect when $q(x)$ is forced to be 0 in some areas even if $p(x) > 0$. We call *zero-avoiding* the effect when $q(x) = 0$ is avoid whenever $p(x) > 0$. Select true statements.

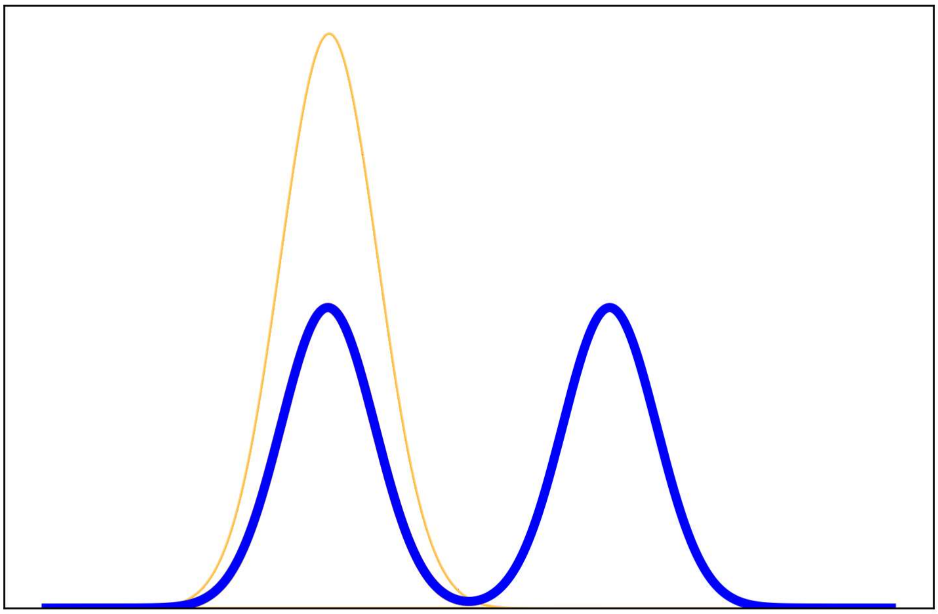
- [ ] $\mathcal{KL}(q||p)$ is zero-forcing.
- [ ] $\mathcal{KL}(q||p)$ is zero-avoiding.
- [ ] $\mathcal{KL}(p||q)$ is zero-forcing.
- [ ] $\mathcal{KL}(p||q)$ is zero-avoiding.

1
point

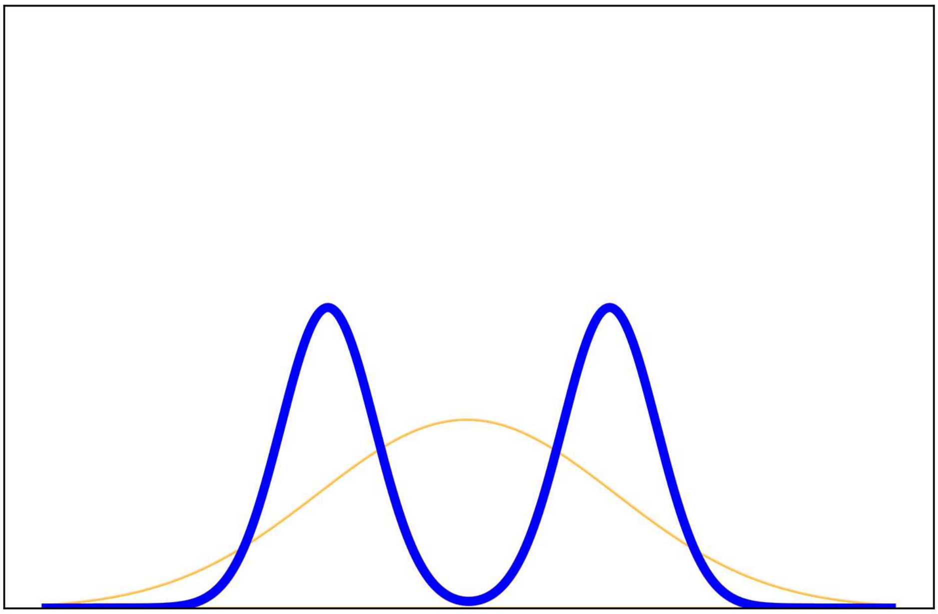
3.

Consider we learn true bimodal distribution $p(x)$ (blue line) with Gaussian distribution $q(x)$ (orange line) by minimizing reverse $\mathcal{KL}$-divergence $\mathcal{KL}(q||p)$. Which distribution will be fitted?

a)



b)



1 point

4.

What variational family is used in mean field approximation method?

- Gaussian distribution
- Any distributions we want
- Factorised distribution

1 point

5.

Choose update formula for mean field.

- $\log q_j(x_j) = \mathbb{E}_{x_{-j}} \log p(x) + const.$
- $\log q_j(x_j) = \mathbb{E}_{x_{-j}} \log p(x).$
- $q_j(x_j) = \mathbb{E}_{x_{-j}} p(x) + const.$

1
point

6.

Can we calculate every factorized distribution for one step?

- No, we should update all factorized distributions one after another until they converge.
- Yes, they depend only on joint distribution.

I, **Saurabh Kumar Pandey**, understand that submitting work that isn't my own may result in permanent failure of this course or deactivation of my Coursera account.

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