Math 789 Wasserstein GANs

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1 Wasserstein-1

$||x - y||$ - here we can consider it as distance between θ and 0
Therefore, its value will be $|\theta|$

2 Jensen-Shannon

- for $\theta = 0$, the manifolds will cut each other and hence KL-Divergence would be 0

- for $\theta \neq 0$, $P_0 + P_\theta = 1$ and $P_m = (P_\theta + P_0)/2$, using the formula of KL-Divergence and simplifying gives the answer $\log 2$

3 $KL(\mathbb{P}_\theta || \mathbb{P}_0)$

- for $\theta = 0$, the manifolds will cut each other and hence the KL-Divergence would be 0

- The manifold distribution won't cut each other hence the KL-Divergence will be ∞

4 Total Variation distance

The manifolds could either cut each other at $\theta = 0$ or be wide apart for $\theta \neq 0$. Therefore,

- for $\theta \neq 0$, Maximum separation i.e. the maximum probability difference between both would be 1

- for $\theta = 0$, the probability distribution values would be same and hence the difference between both would be 0