

Questions to Ask[Hands On 3]

1. As we see that an Encoder(in AutoEncoder) gives out a vector in latent subspace and Variational one gives a probability distribution does the output from encoder network done for every x.

Ans- Yes.Ex- In MNIST, each input image has a vector in latent subspace(in AE)and a probability distribution in case of VAE.

2. In the loss function of VAE, when to use cross entropy loss and when to use L2 loss ?

Ans- cross entropy(CLASSIFICATION) and L2 loss(FOR REGRESSION)

3. Can you explain the reparametrization trick for sampling used in VAE that gives a vector instead of a sample space?

Ans- for epsilon, it is found from a Zero mean and unit std dev rand sample

4. **Will the VAE always give out a gaussian distribution (diagonal matrix)? Why and how? $P(z|x)$ always gaussian.(ASK IT AGAIN TO PMJ)**

5. It was mentioned that we often consider covariance matrix to be a diagonal matrix of the same dimension as the mean vectors, is the output a diagonal Matrix and why?

Ans -Just output a vector, we take it as a matrix

6. Instead of KL Divergence can we use any other thing in the elbo loss 2nd part ? Why kl divergence?Can you elaborate on *ELBO loss* : *Evidence Lower Bound loss, is it just the name?Some Modifications.*

7. Where to use VAE and where AE ?

Ans-Depends on Use Cases;VAE for Samples and AE for others

8. In the contour map, is there any pattern how images appear or is it just the way the images are ?

Ans-7 and 9 are identical so they appear overlapped in AE's contour map. 2,3,8 have overlapping points in VAE's contour map.Another reason, latent space is smaller so its overlapping.But for bigger dimensions better separation of classes.