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Provides better trade off between disentanglement and reconstruction quality than Beta VAE

KL divergence term of VAE can be Split into 2 parts – mutual information between the input and its encoded representation and KL divergence between the unconditional distribution of the representation and the prior

Penalizing the entire term penalizes both of its constituent terms – penalizing the mutual information leads to reduced information about the input and its representation which leads to poor a construction quality while it is only penalizing the 2nd term which leads to better disentanglement

solves this problem by adding another term that is meant to explicitly encourage "marginal distribution of representations to be factorial"

this term itself has the so called total correlation (TC) which involves computing a ratio of the probability density of the representation and the product of the probability density of its individual dimensions or components
this ratio is approximated using a discriminator or classifier for which apparently a multilayered perceptron is used– this outputs the probability that its input as a sample of encoded output density rather than the product of the densities of its individual latent dimensions which forms the denominator of the TC

some more trickery is used to speed up the processing including a kind of the dimension permutation where a batch of encoded representations is subjected to mixing and matching along dimensions by generating a different random permutation of the samples for each dimension and then picking the values for that dimension in the order of that permutation to form new samples where individual dimension values from different samples of the original batch have been mixed together randomly
Apparently this is a standard trick from the independence testing literature

Also introduces a new metric to measure the disentanglement performance