- 1. Generative Modeling with Optimal Transport Maps.

Do Neural OT Solvers Work?

pg 4: Recent evaluation of continuous OT methods for W_2 (Korotin et al., 2021b) reveals their crucial limitations, which negatively affect their scalability, such as poor expressiveness of ICNN architectures or bias due to regularization.

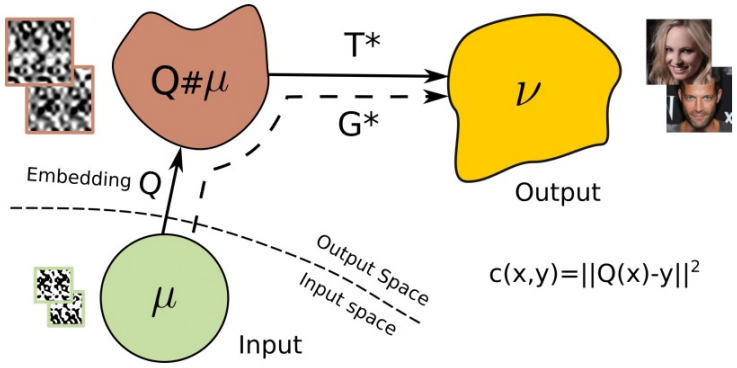


Figure 4: The scheme of our approach for learning OT maps between unequal dimensions. In the figure, the setup of §5.1 is shown: μ is a noise, Q is the bicubic upscaling, ν is a distribution of images.

Do Neural OT Solvers Work?

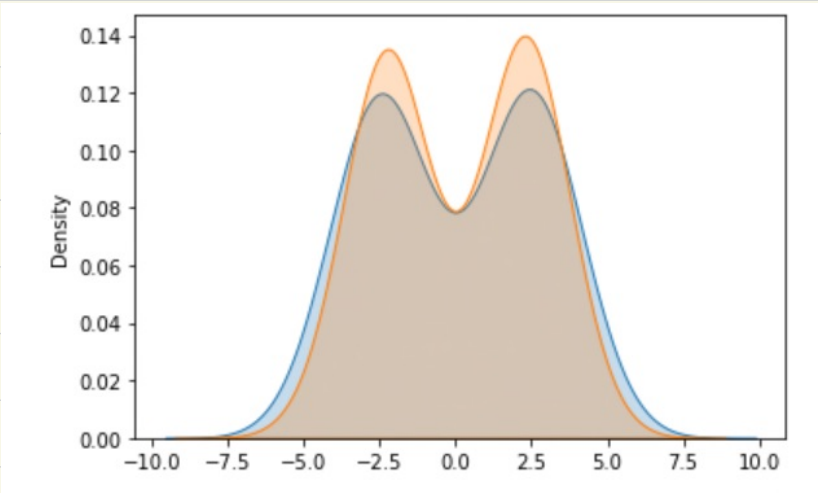
- (Korotin et al., 2021b)

Limitations. We rely on ICNN gradients as $\mathbb{W}_2$ optimal transport maps to generate pairs of benchmark measures. It is unclear whether analogous constructions can be used for other costs such as $\mathbb{W}_1$. We also limit our benchmark pairs to be absolutely continuous measures while limiting the ground truth transport maps to be gradients of ICNNs, which may not have enough representational power. While we reveal a discrepancy between performance in OT-related tasks and performance in generative modeling, in-depth study is needed to answer questions such as what exact dissimilarity metric [QC] implies that explains its generative performance while poorly approximating $\mathbb{W}_2$.

- Wasserstein-2 Generative Networks:

- Fully-connected ICNNs satisfy universal approximation property (Chen et al (2018)).

modify ICNN structure. (not divided by size).



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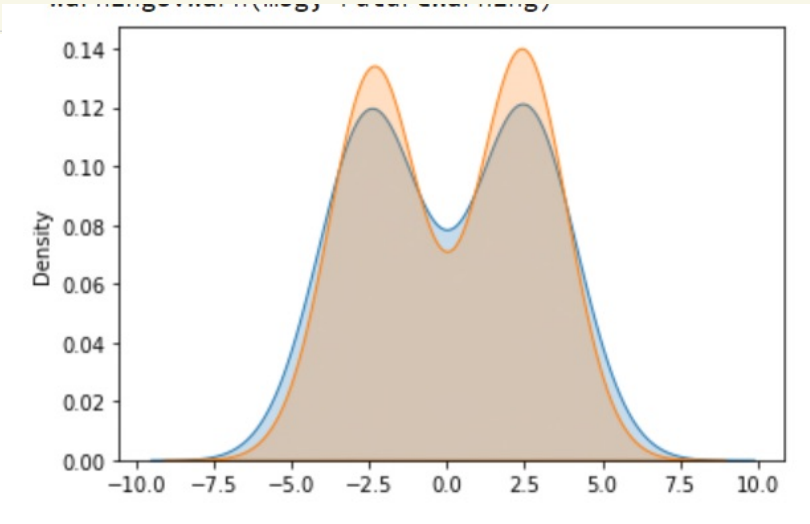

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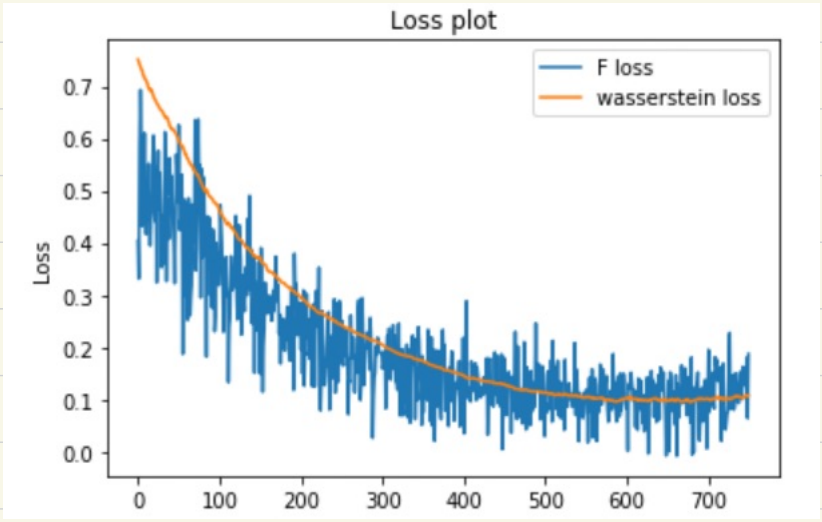
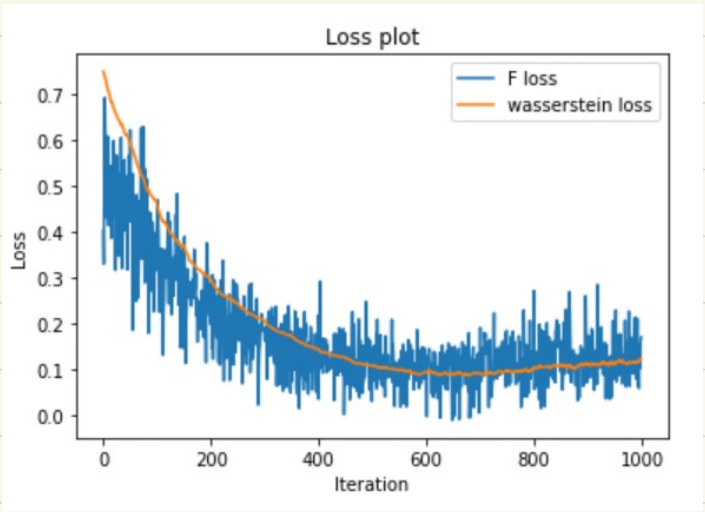
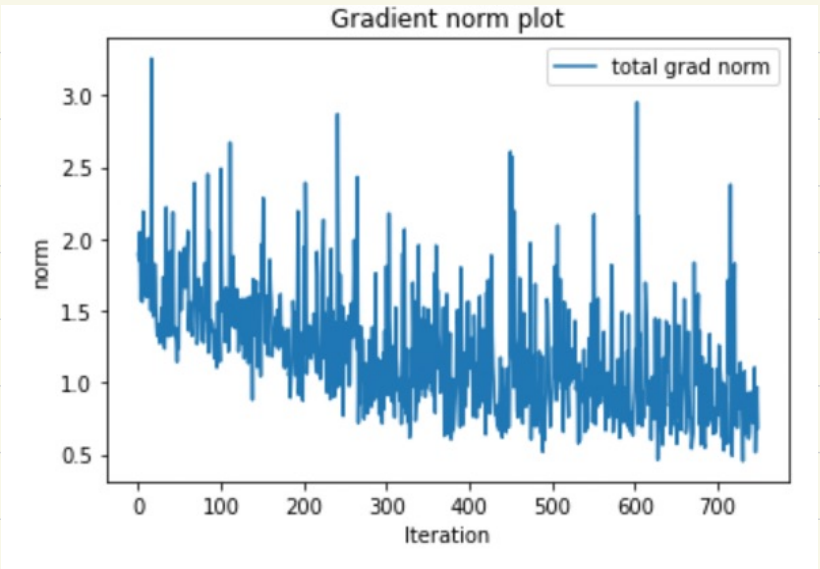
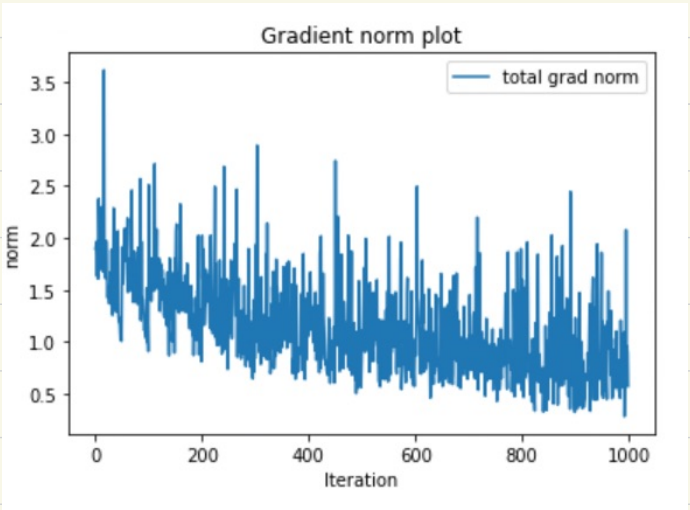
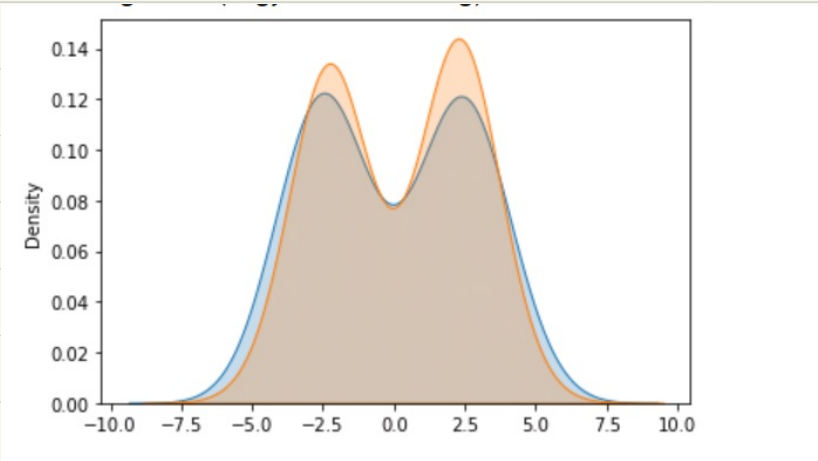








Moving average. average over 50, pad = 5.



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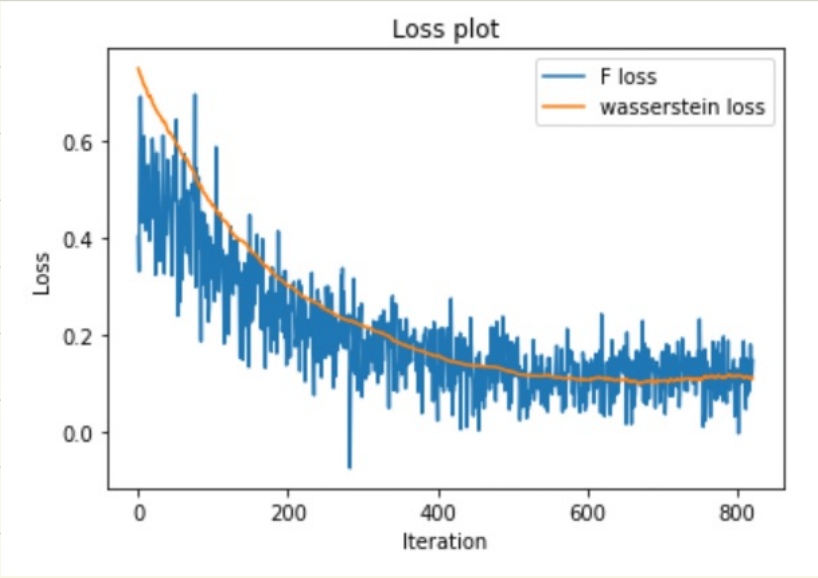
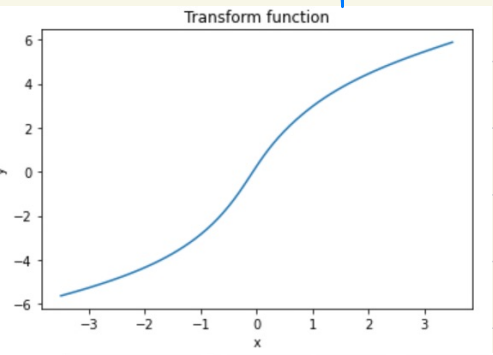
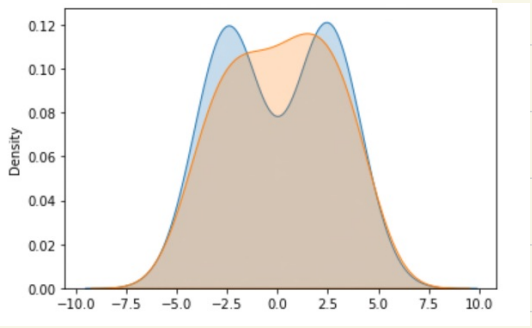


Residual NN. epoch 10.





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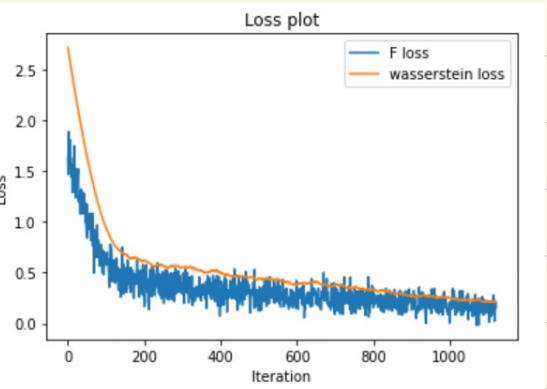
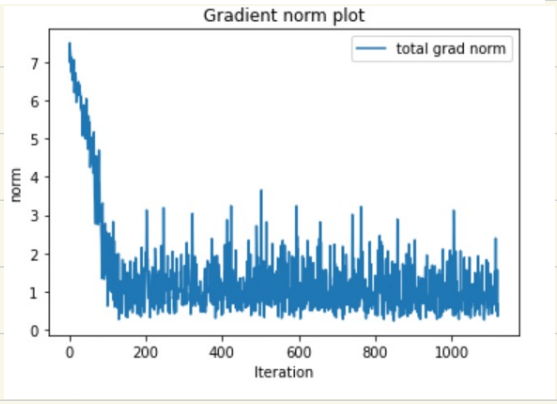
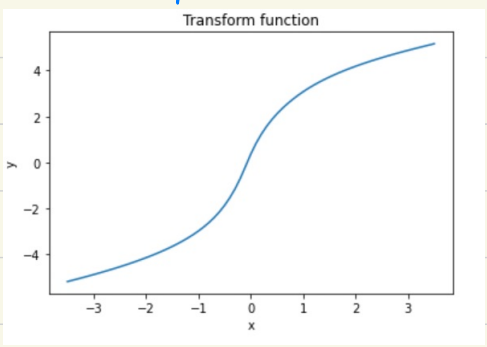
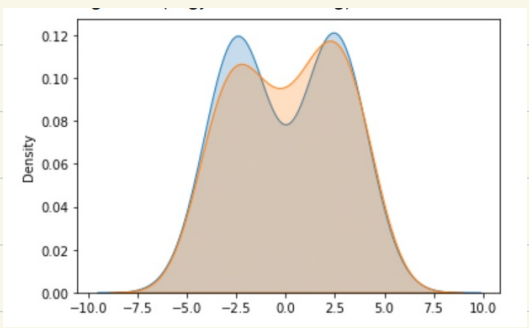




epoch 20.





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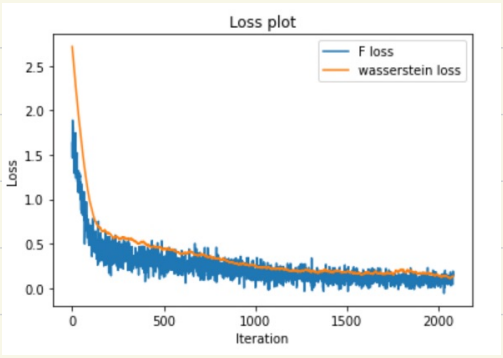
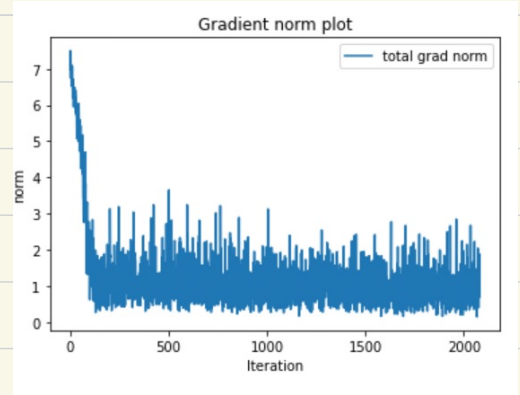
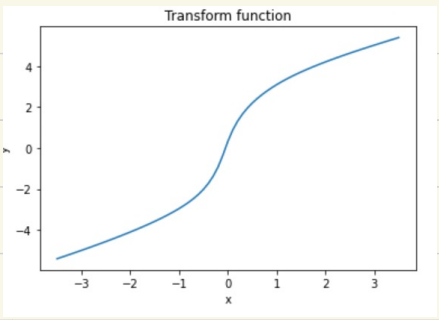
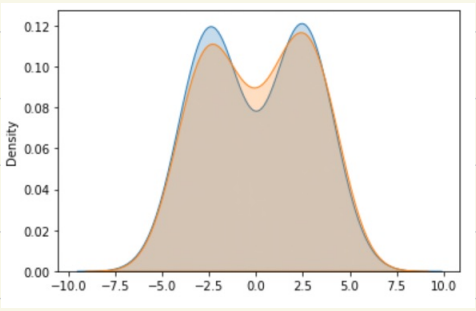




epoch 30.





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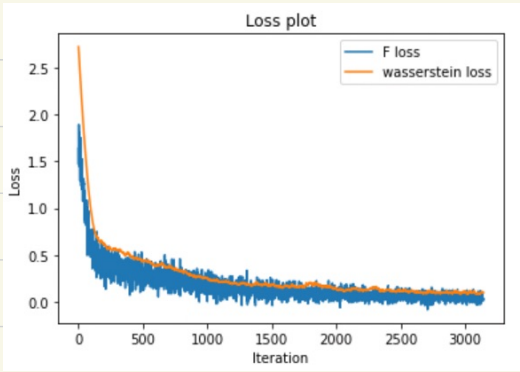
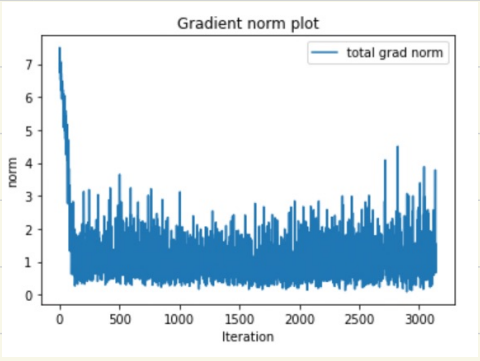
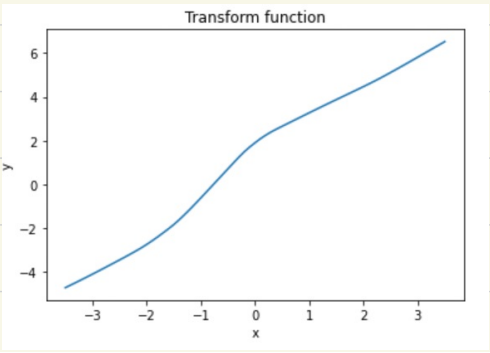
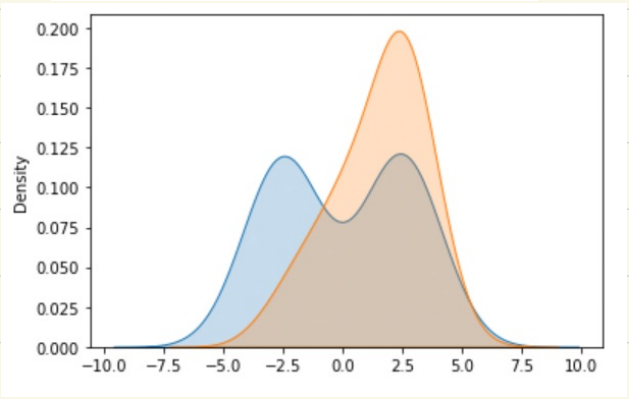




ICNN no constraint.





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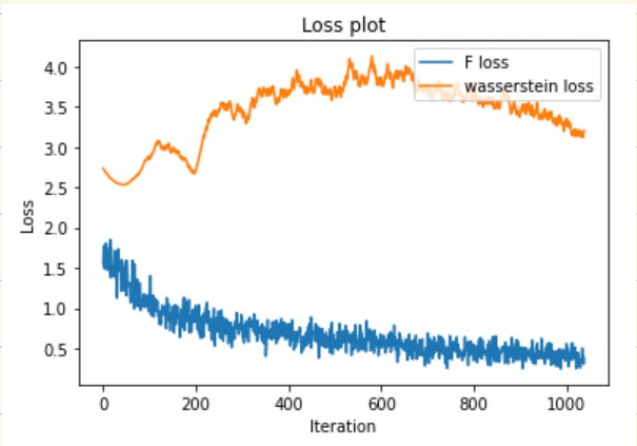
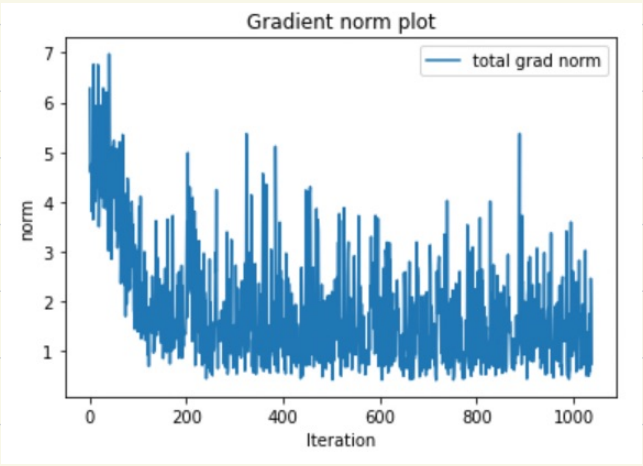
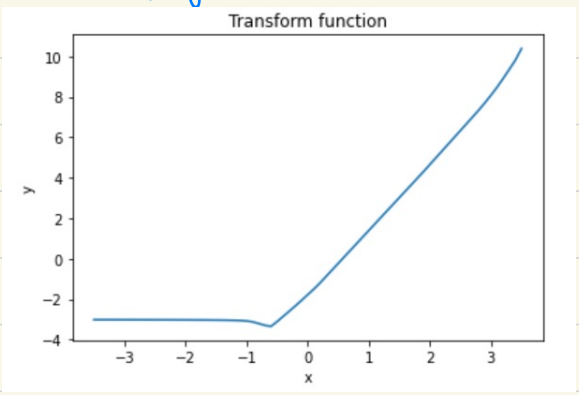
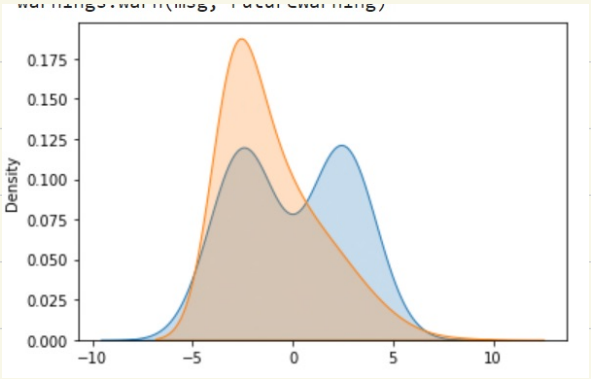




fully connected NN.





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