

What is the difference betw generative and discriminative methods

A generative model only applies to probabilistic models. In this scenario where we have an input x and an output y , a model is generative if it gives us the model of the joint distribution of x and y together

It is called generative because you can **generate** with the correct probability distribution data points. In many of the tasks we want to solve like classification problems we are not really interested in the joint distribution. We are interested in finding the best output given the input. We are interested in the distribution of the input. Some people could argue that it is a waste of data to model joint distribution, we should only model the conditional distribution of the output given the input. Strictly speaking this would be a conditional model. Conditional models are discriminative and not generative. If you take it a step further, and you do not model probabilities at all, but you just have a rule for mapping the input to the output, this would be a pure discriminative model.

In other words, a generative model can be used to simulate (i.e. *generate*) values of any variable in the model, whereas a discriminative model allows only sampling of the target variables conditional on the observed quantities

A generative model is more informative than a discriminative model or a conditional model. If you have a generative model you can get conditional and marginal distributions (see marginalization), if you want. If you have a model of the conditional distribution there is no way you can get the joint distribution

Generative models are good because they give us all the information, if in some contexts we want the mapping the input to the output we can do that. We get different perspective on data.

the end for now----