

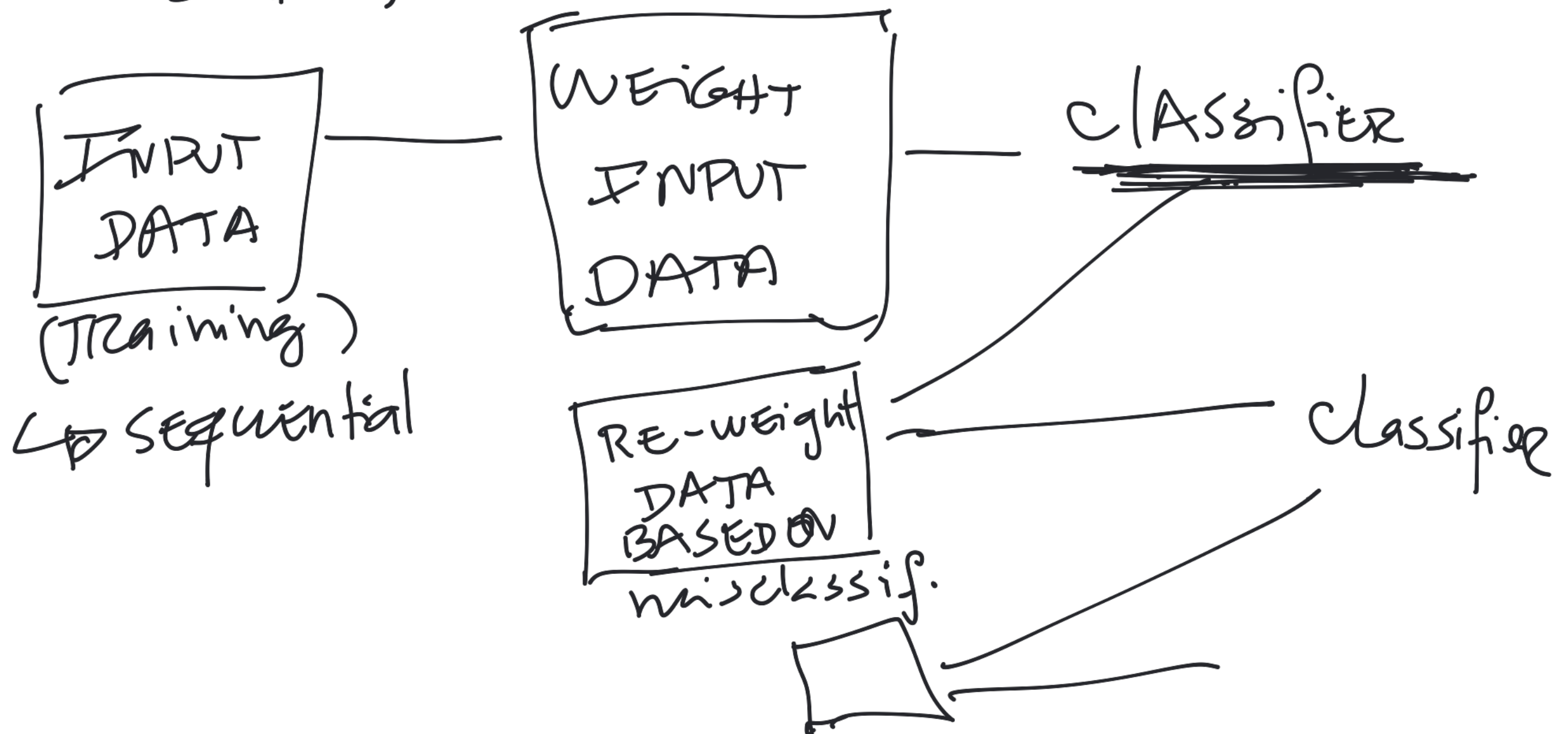
## LECTURE 19

Improve Gen. Realization ability  
of NN:

↳ Bagging (Bootstrap aggregating)

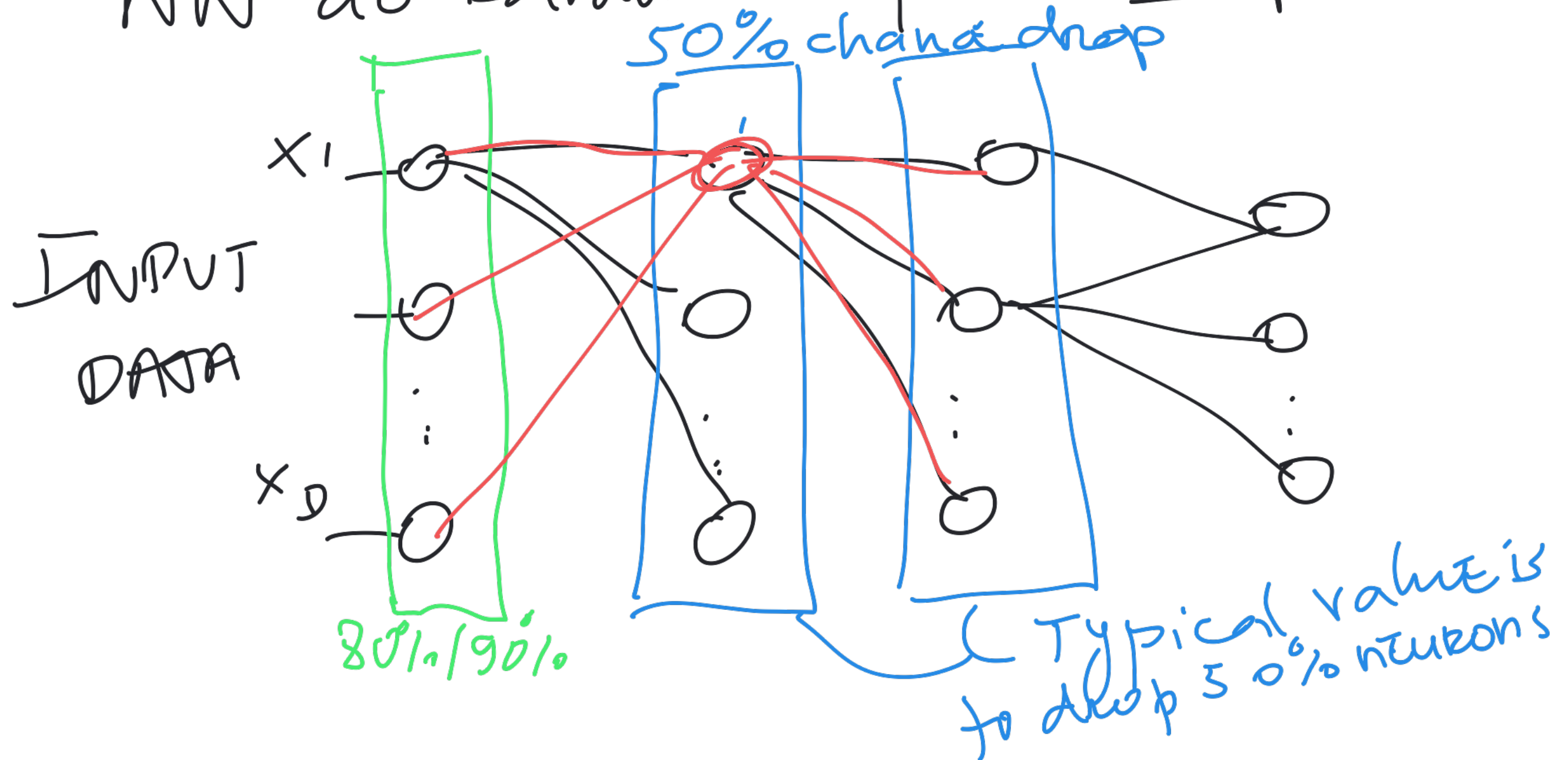


↳ Boosting: weights samples based  
"difficulty" (defined by misclassification  
ERROR)



## ↳ Dropout

↳ Drop weights connections in a NN at random w/ prob.  $\frac{1-p}{1}$ .

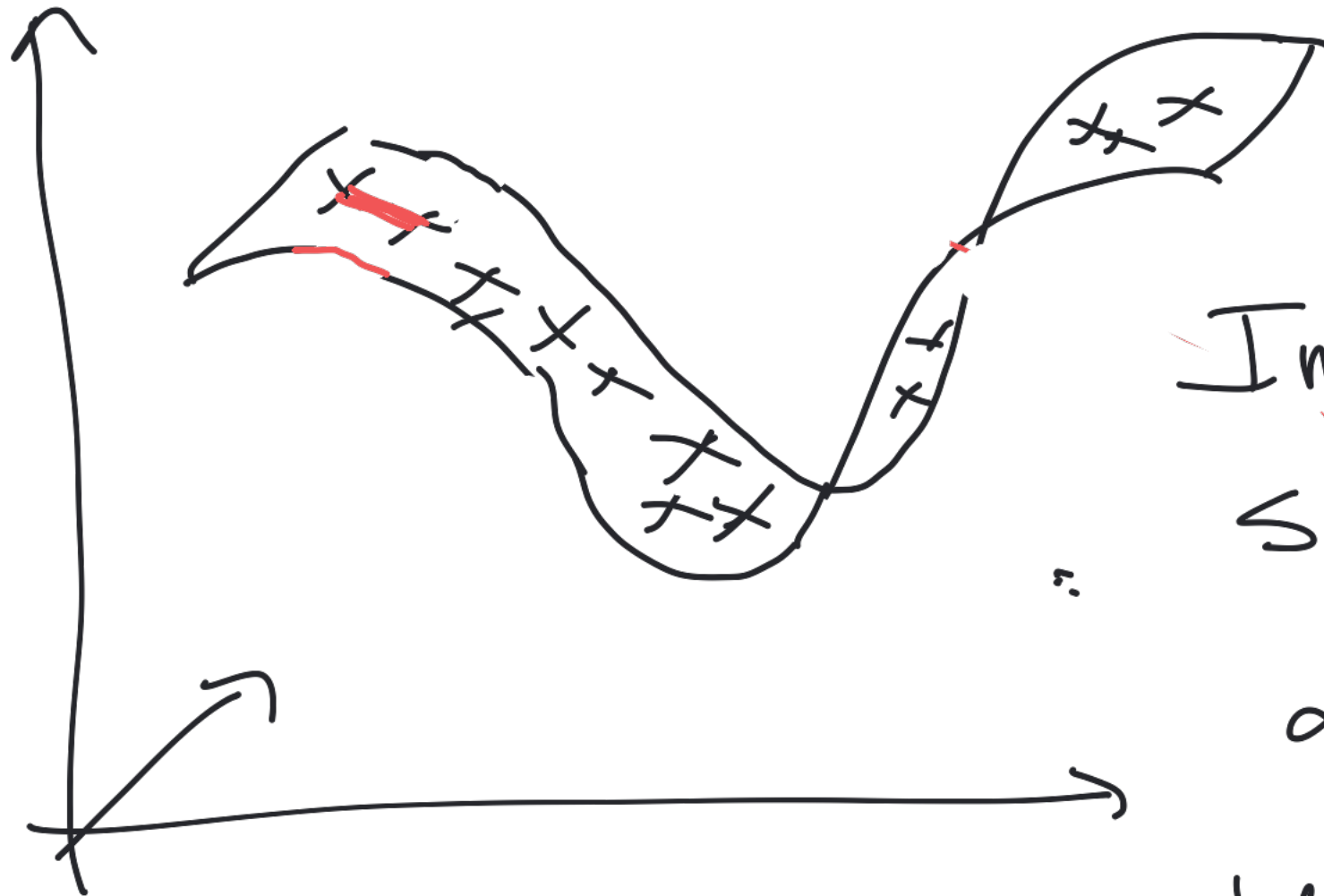


## PCA and LDA

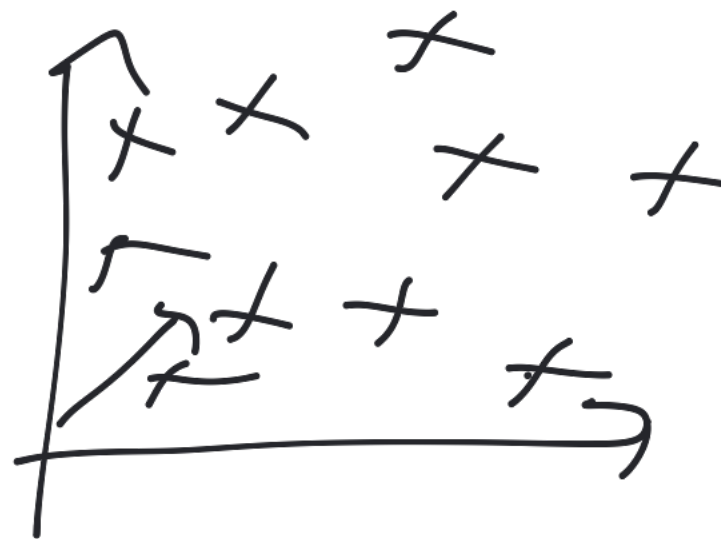
↳ assume that the data  
"lives" in a linear manifold

↳ PCA will maximize explained  
variance

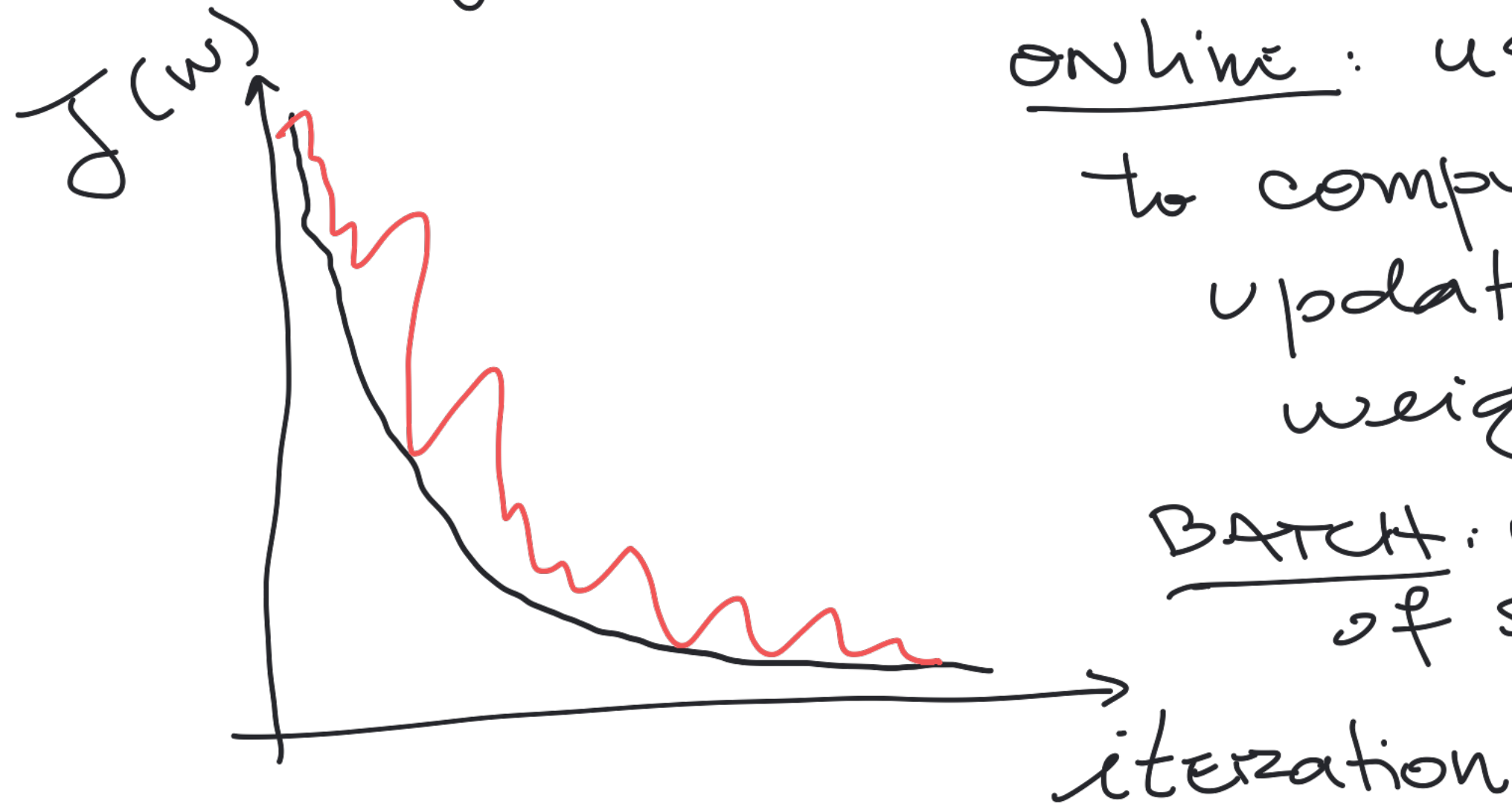
↳ LDA will maximize class separability



Images data  
set generally  
data is not  
uniformly  
distributed



# Learning Curves



online: uses 1 sample  
to compute gradient  
update the  
weights

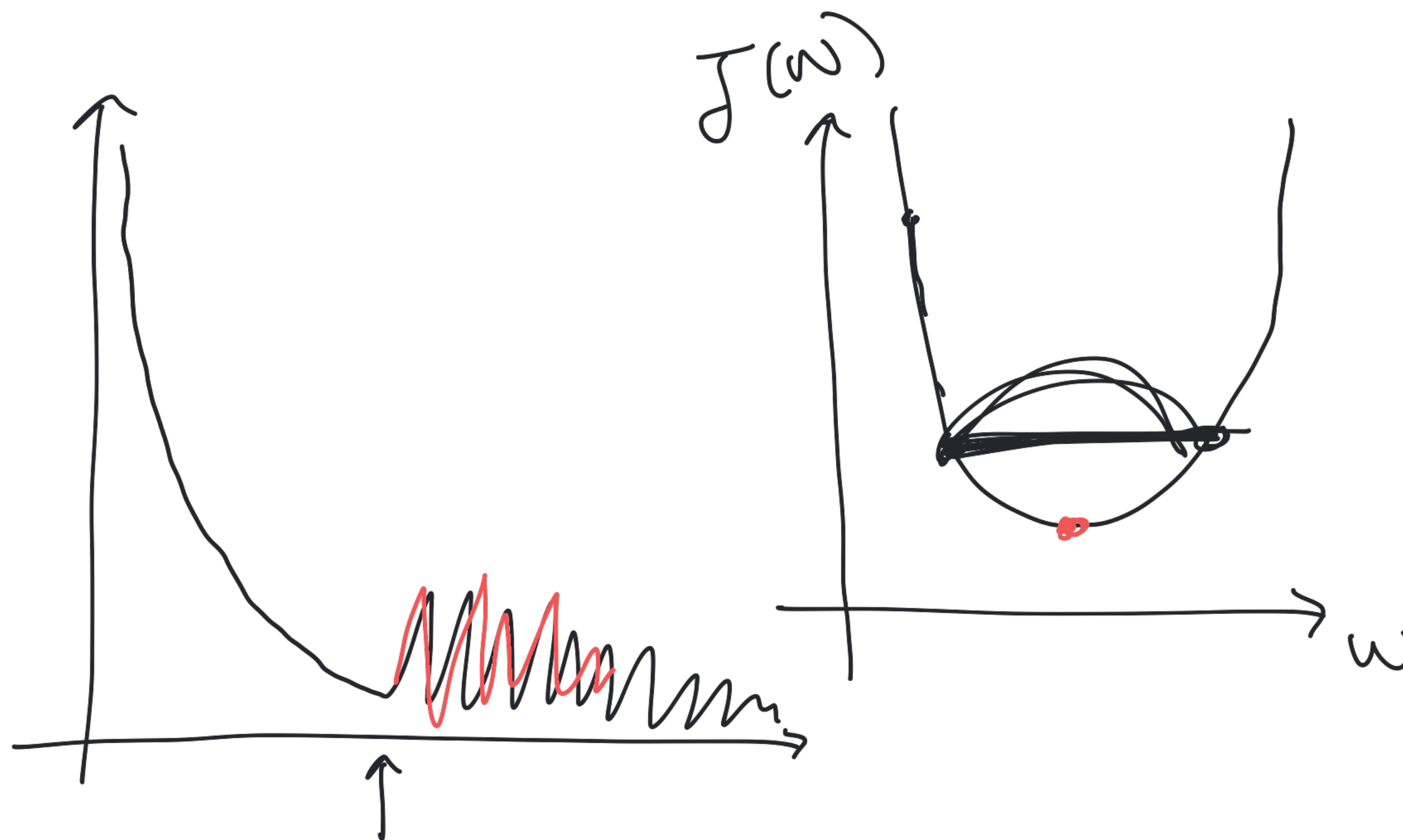
BATCH: uses a set  
of samples

online

↳ sensitive  
to outliers

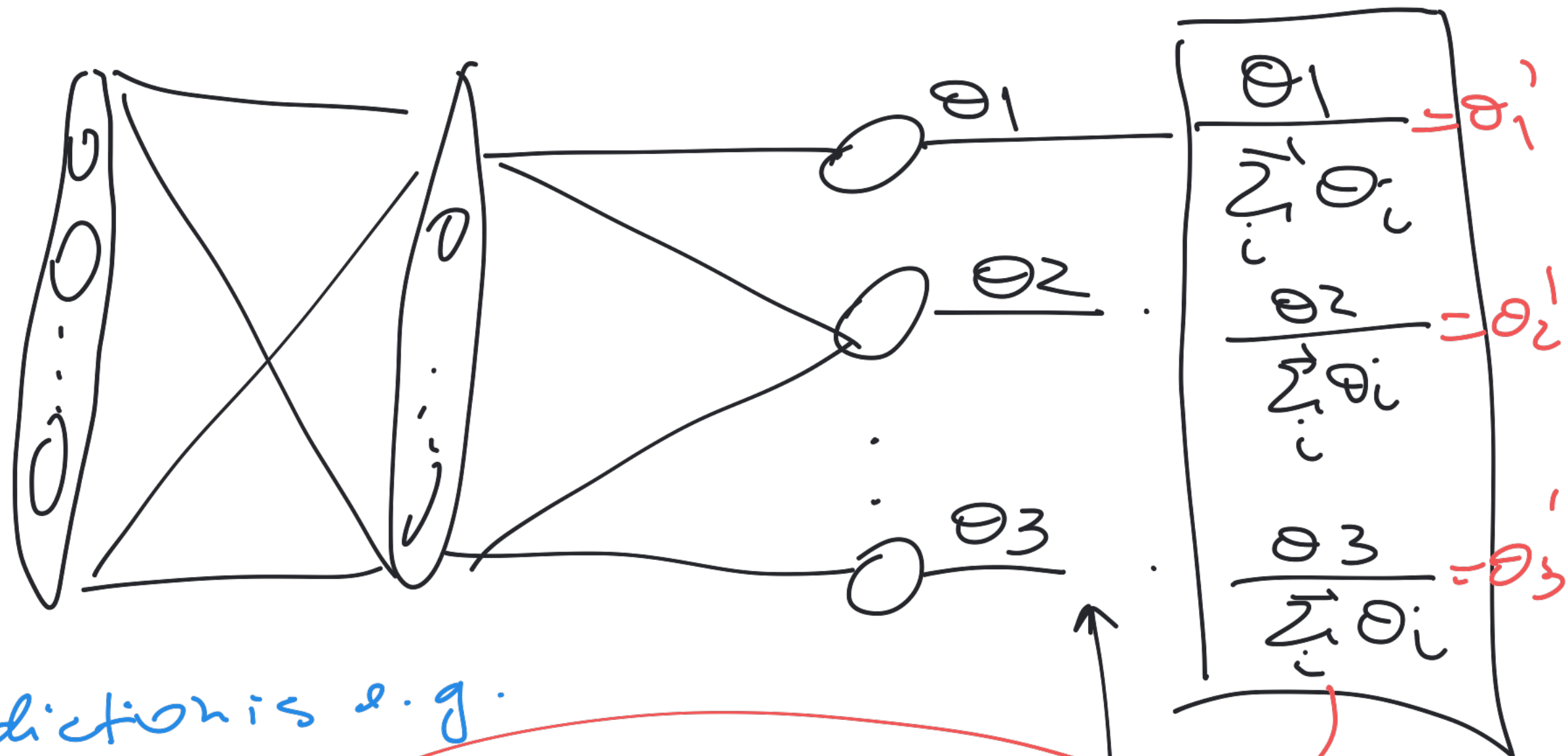
BATCH

↳ TAKES longer  
as BATCH size  
increases

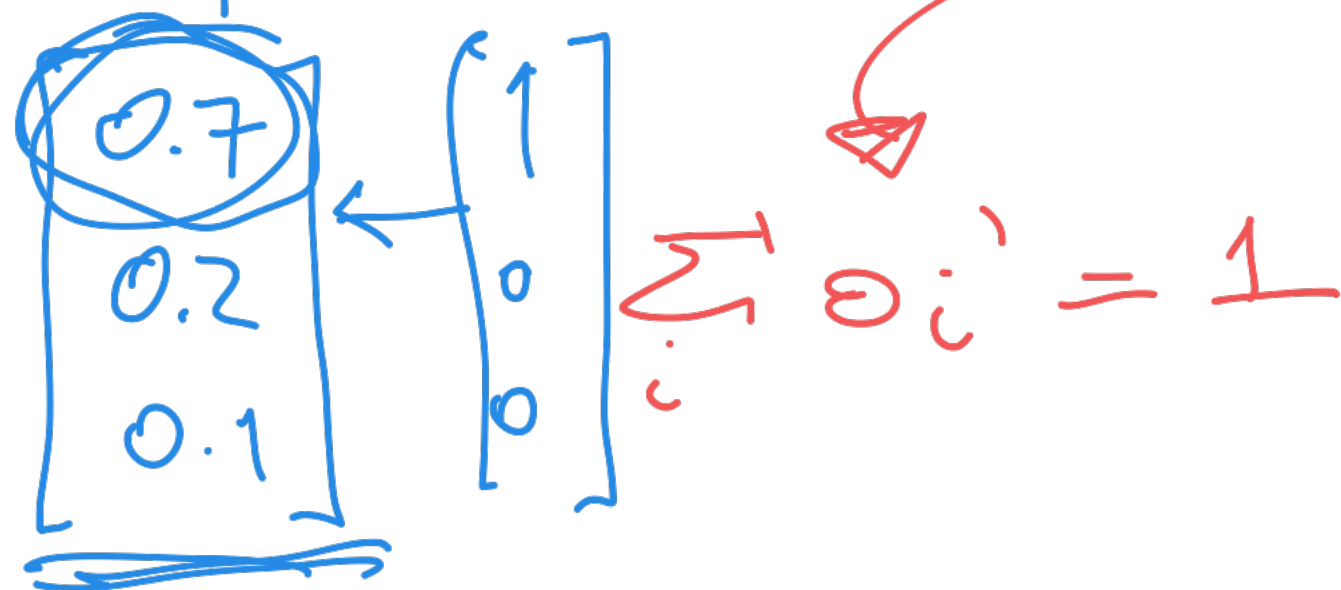


should decrease  
learning rate





$X_1$  prediction is e.g.



Softmax  
activation  
fct.