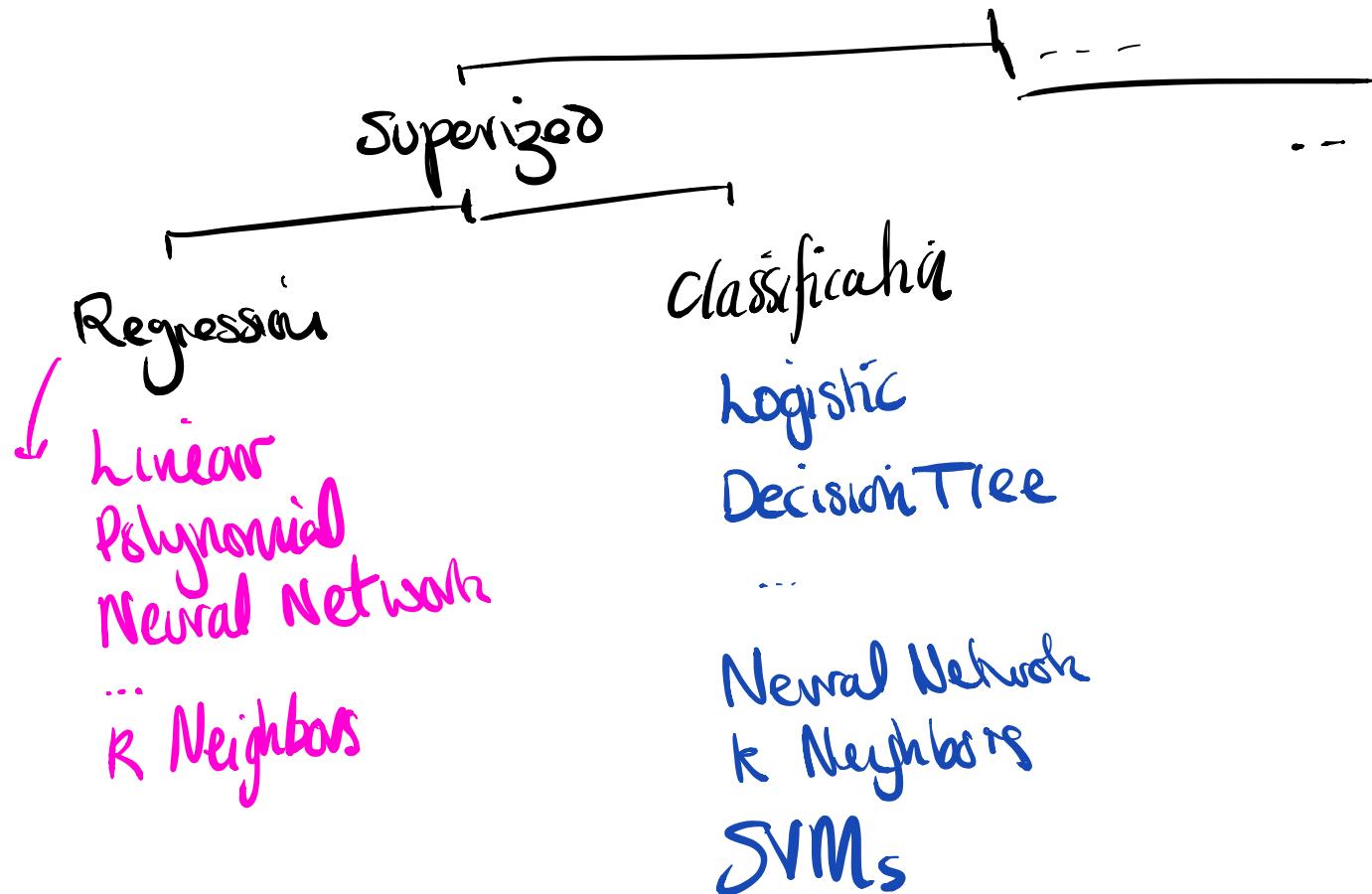


Introduction to ML

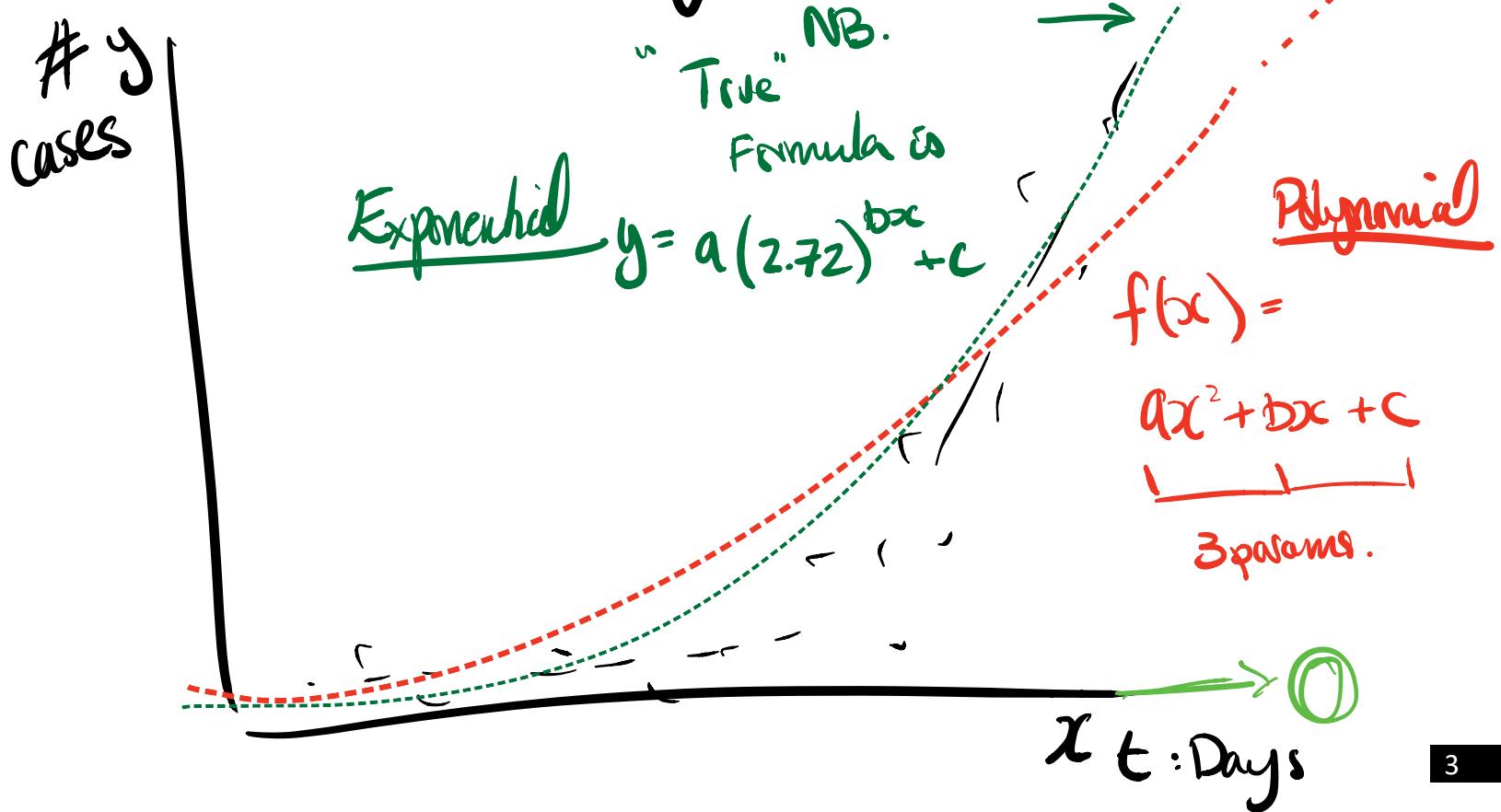
How do I choose
between Models?

What models are there?

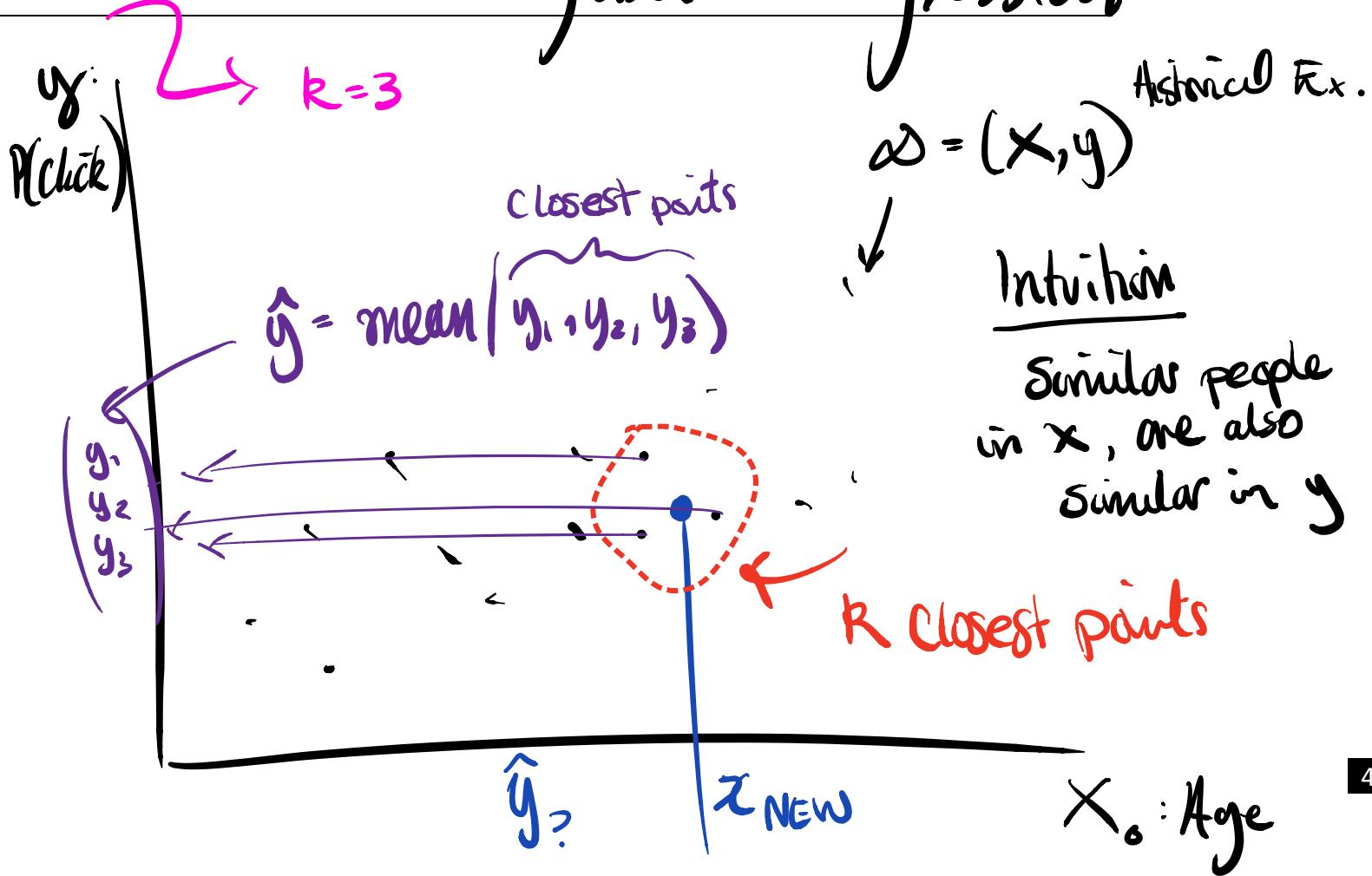
What Models are there?



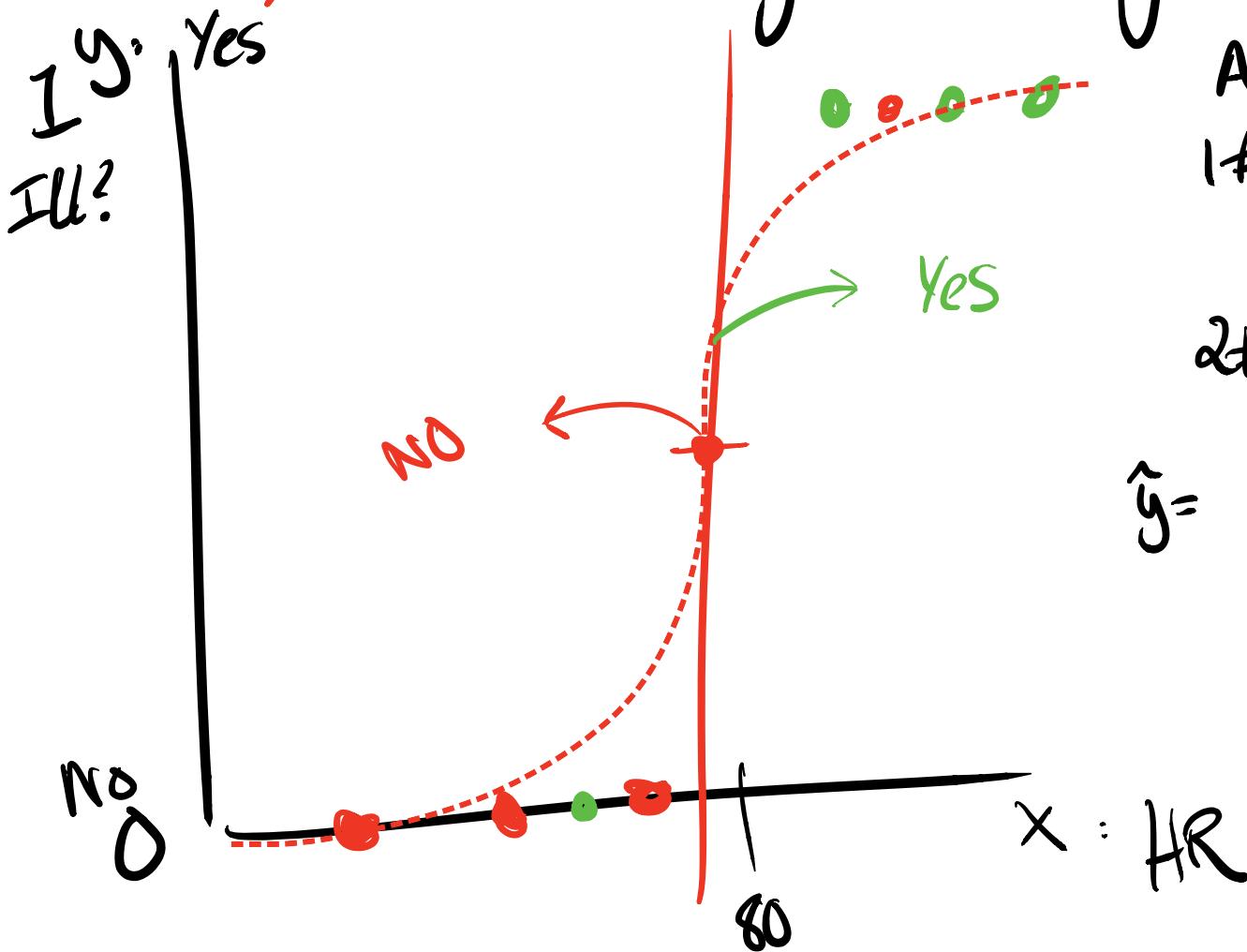
Polynomial Regression



K Nearest Neighbors Regression



Classification: logistic Regression



Aside:
1# Regressor
to find \hat{y}

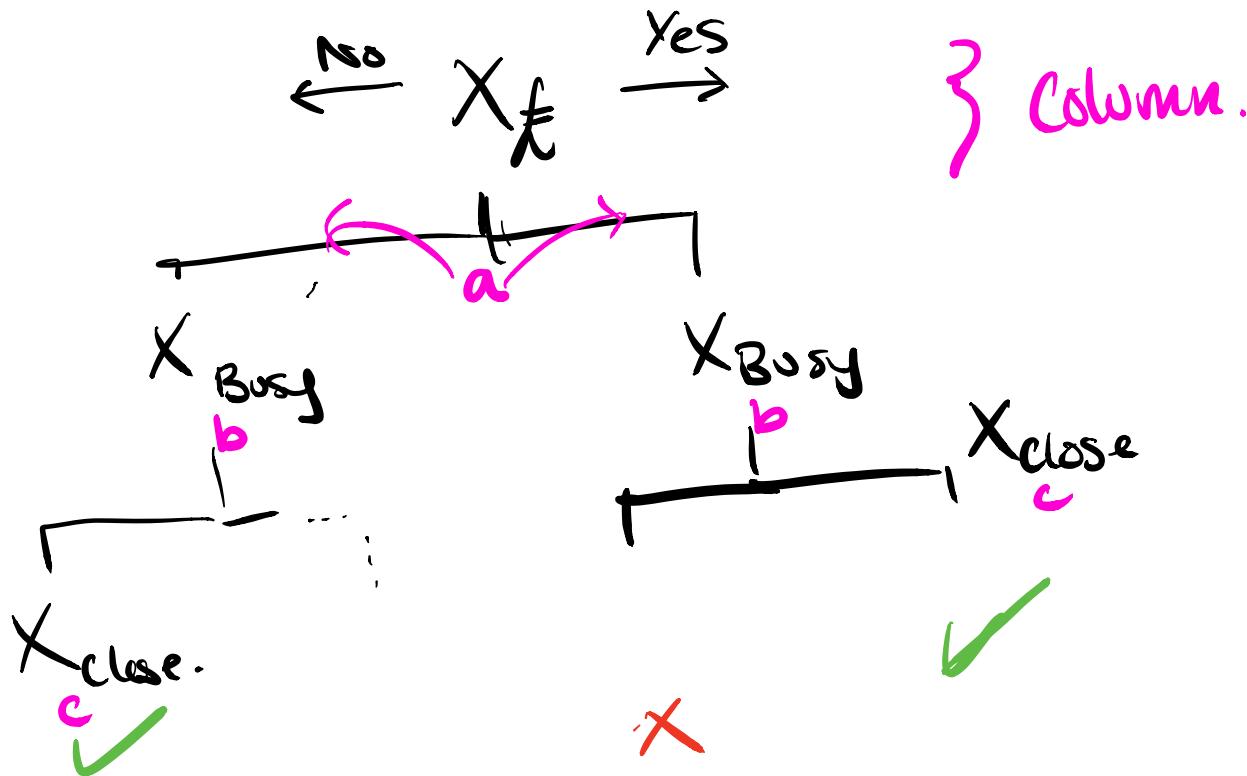
2# use \hat{y}

$$\hat{y} = \begin{cases} 0 & \downarrow \\ 1 & \downarrow \end{cases}$$

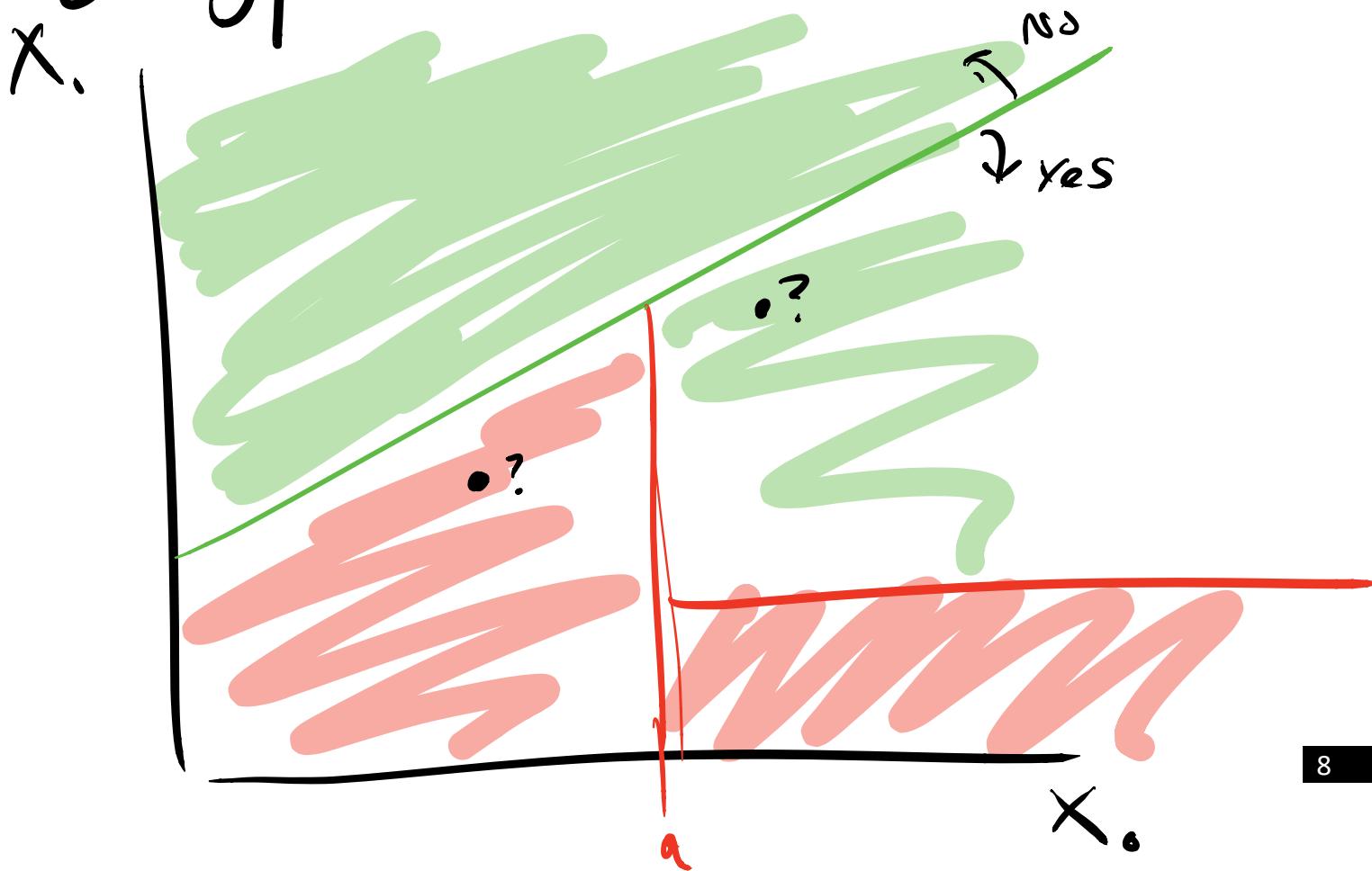
Classification: Decision Trees

	$a = 4$	$b = \checkmark$	$c = \times$	y_0
x_{point}	x_{close}	x_{Busy}		
ER.	3	✓	✓	✓
	5	✗	✗	✓
OK	250	✗	✗	✗
	6	✓	✗	✓
OK	5	✓	✗	✓
	4	✗	✗	✗

Visualizing the D.T. Alg.

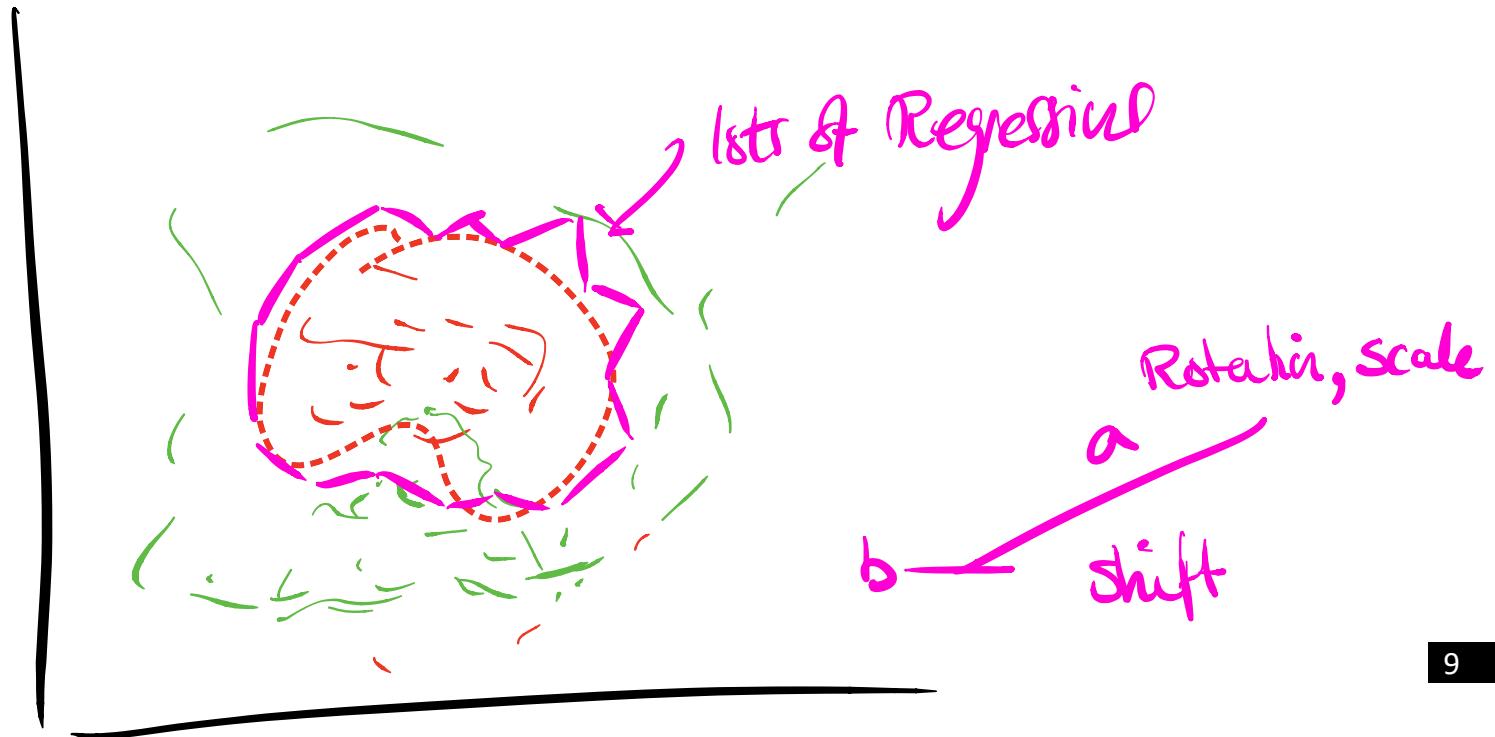


Vizualisif D.T. Predicchia



Neural Networks

⇒ complex patterns, lots of regressions



Aside: How do NNs Work?

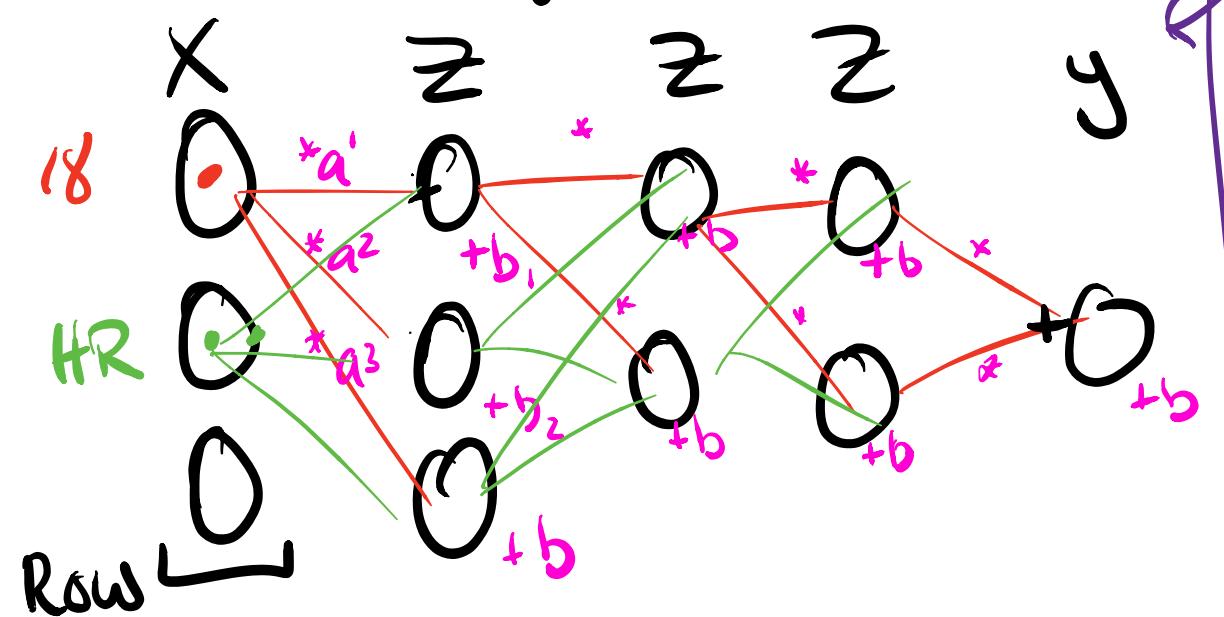
→ We design a flexible Model.
(1000s to, even 1 Billion Parameters)

How do I design such a model?

This diagram helps.

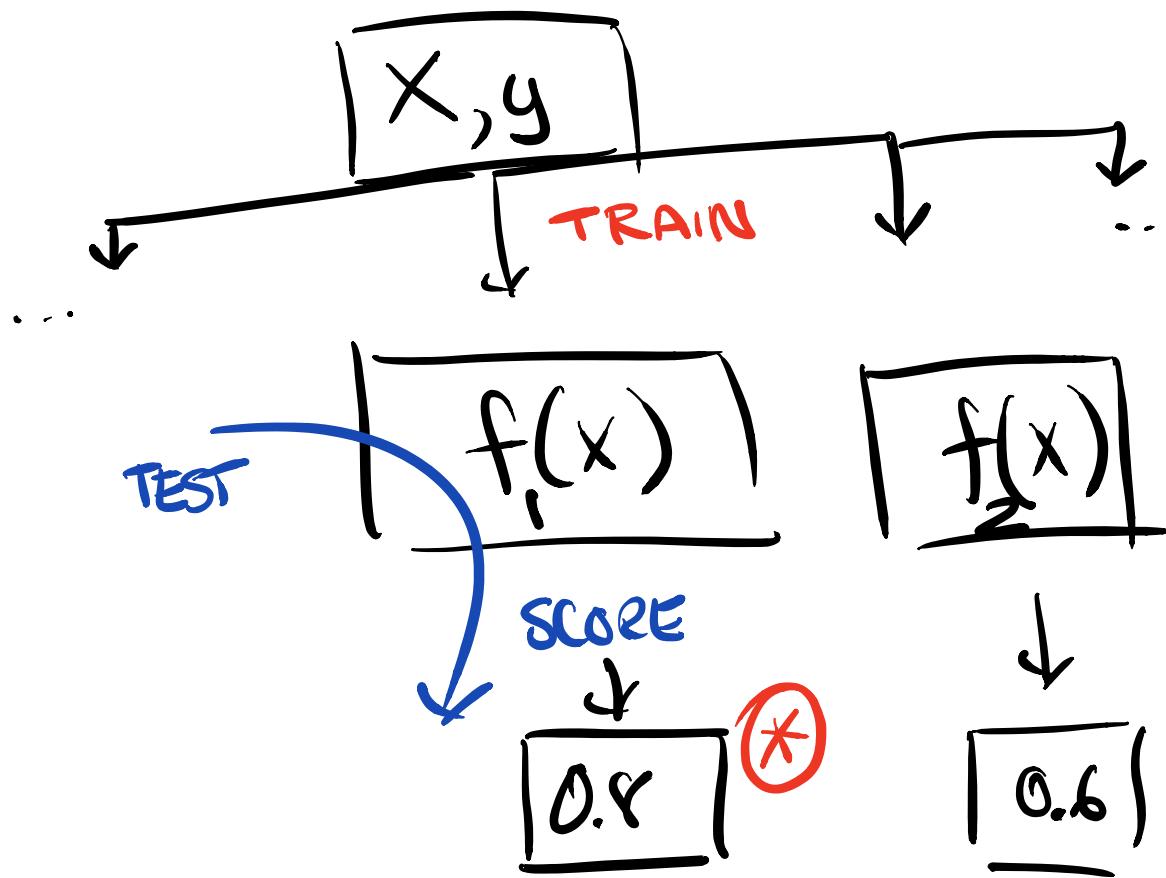
↖ Multiply

$$OK \sum + b$$



How do I choose between these?

Short Answer: Try them all.



How do I score a model?

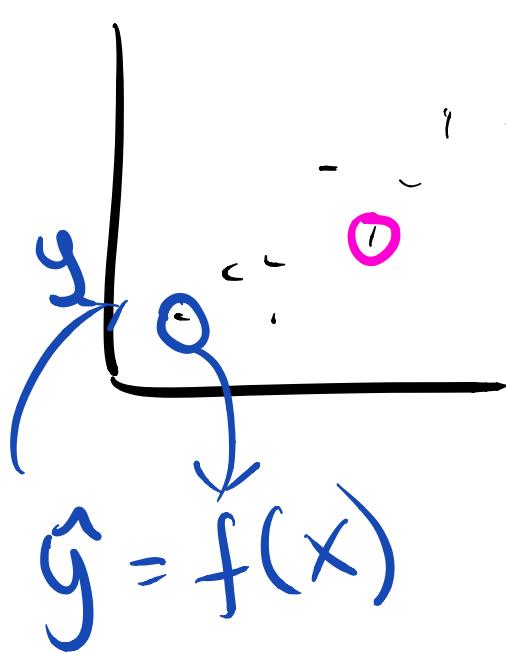
Thought : Use (X, y) to train
Use (X, y) to test

↳ i.e. The Same
Historical
Dataset

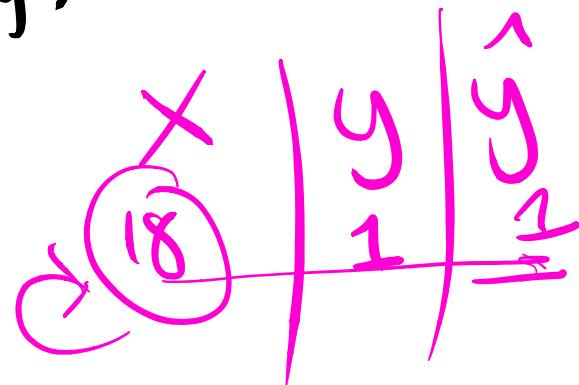
Problem: Algorithms "Remember"
Data

-
- fit (Histone)
 - Score (Histogram)

Eg. RNN $k = 1$



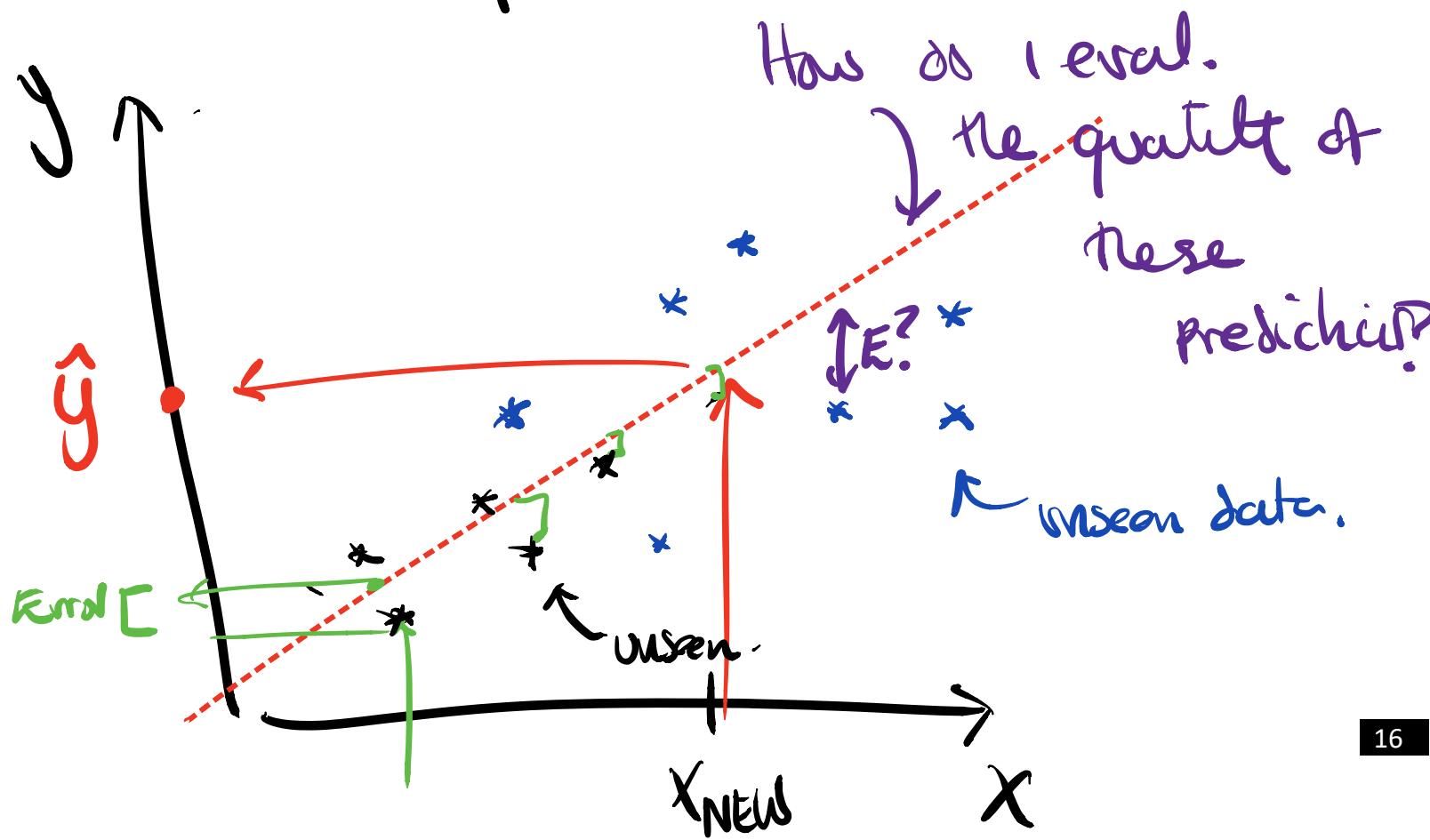
$$\leftarrow \mathcal{D} = (x, y)$$



$$Score = 100$$

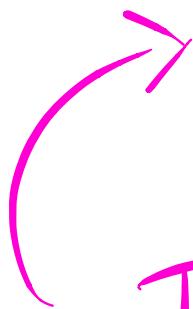
Evaluating Models

7

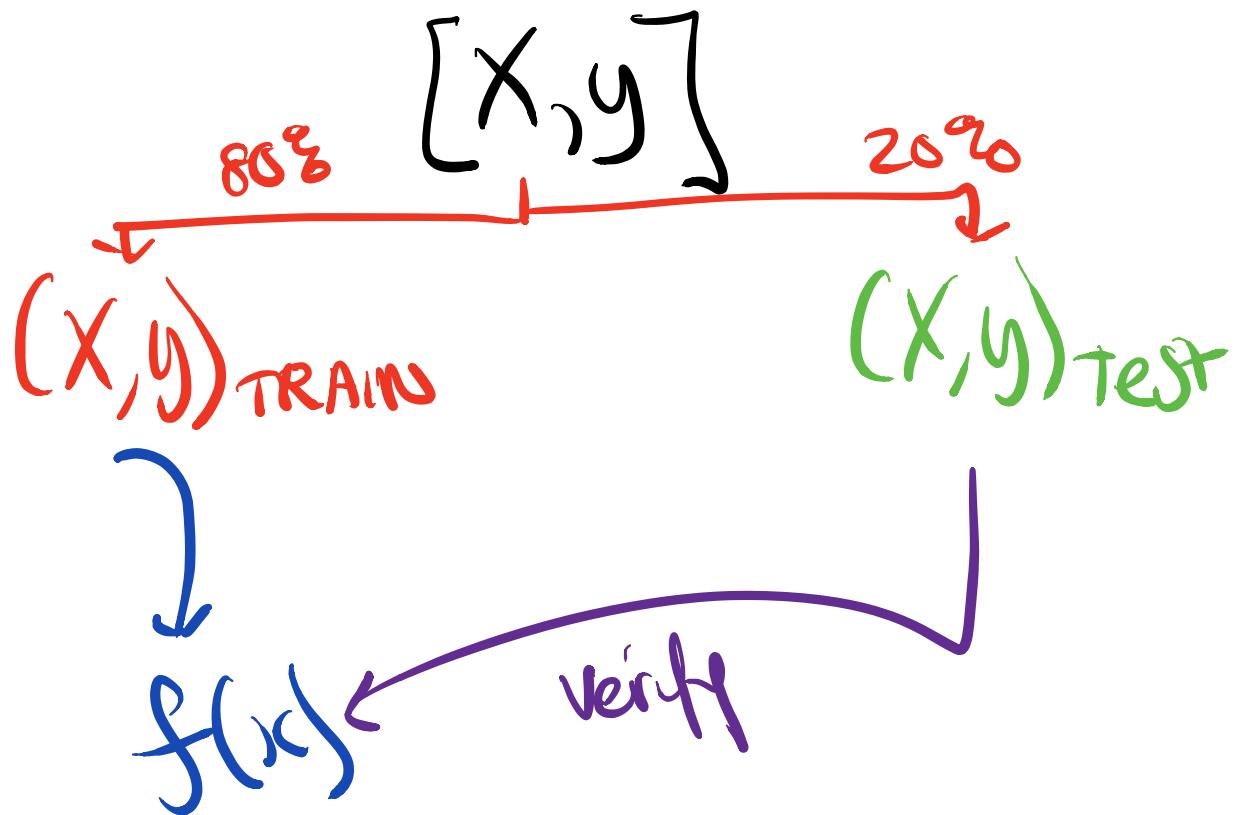


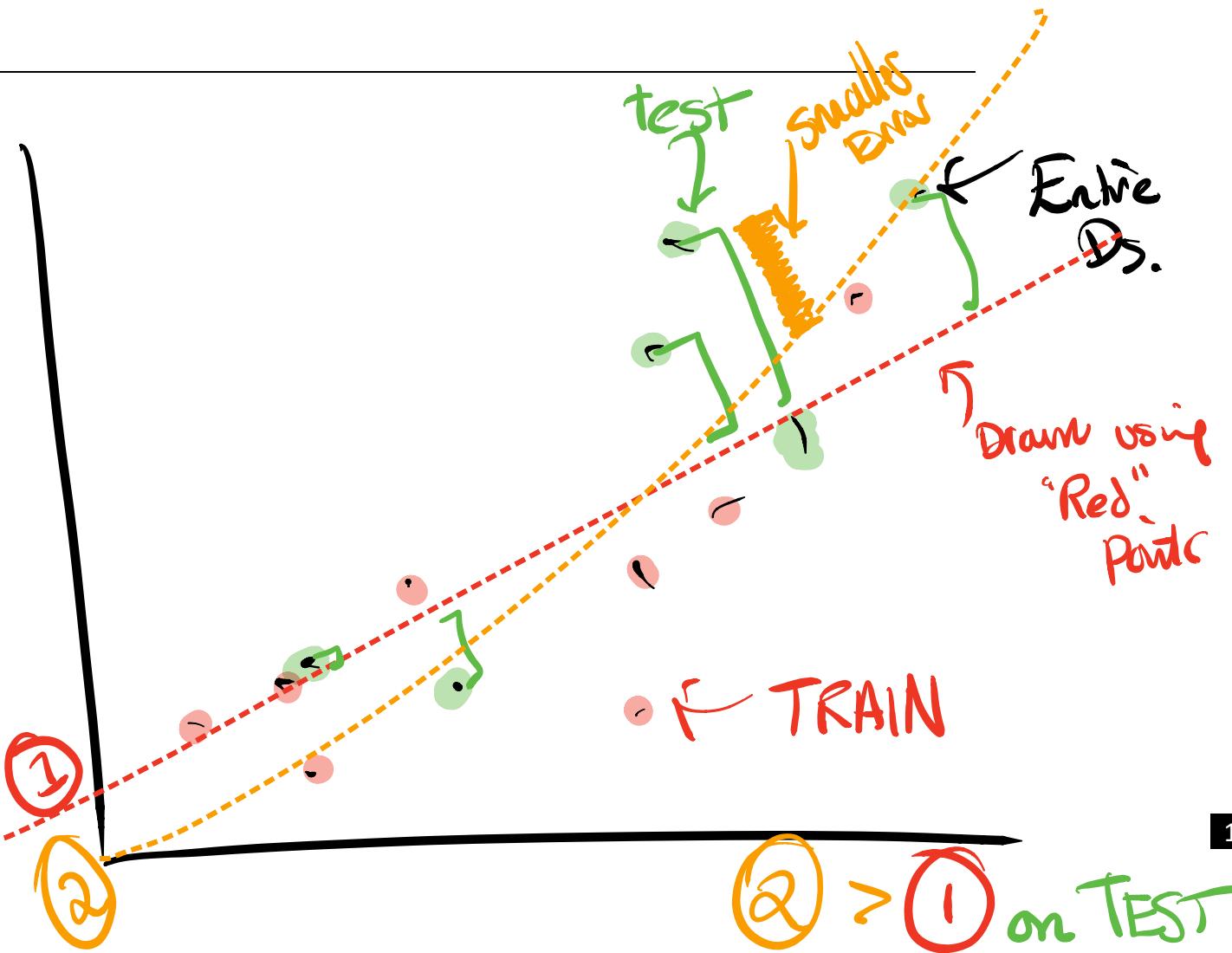
Goal:

How well will the
model perform on
unseen data?



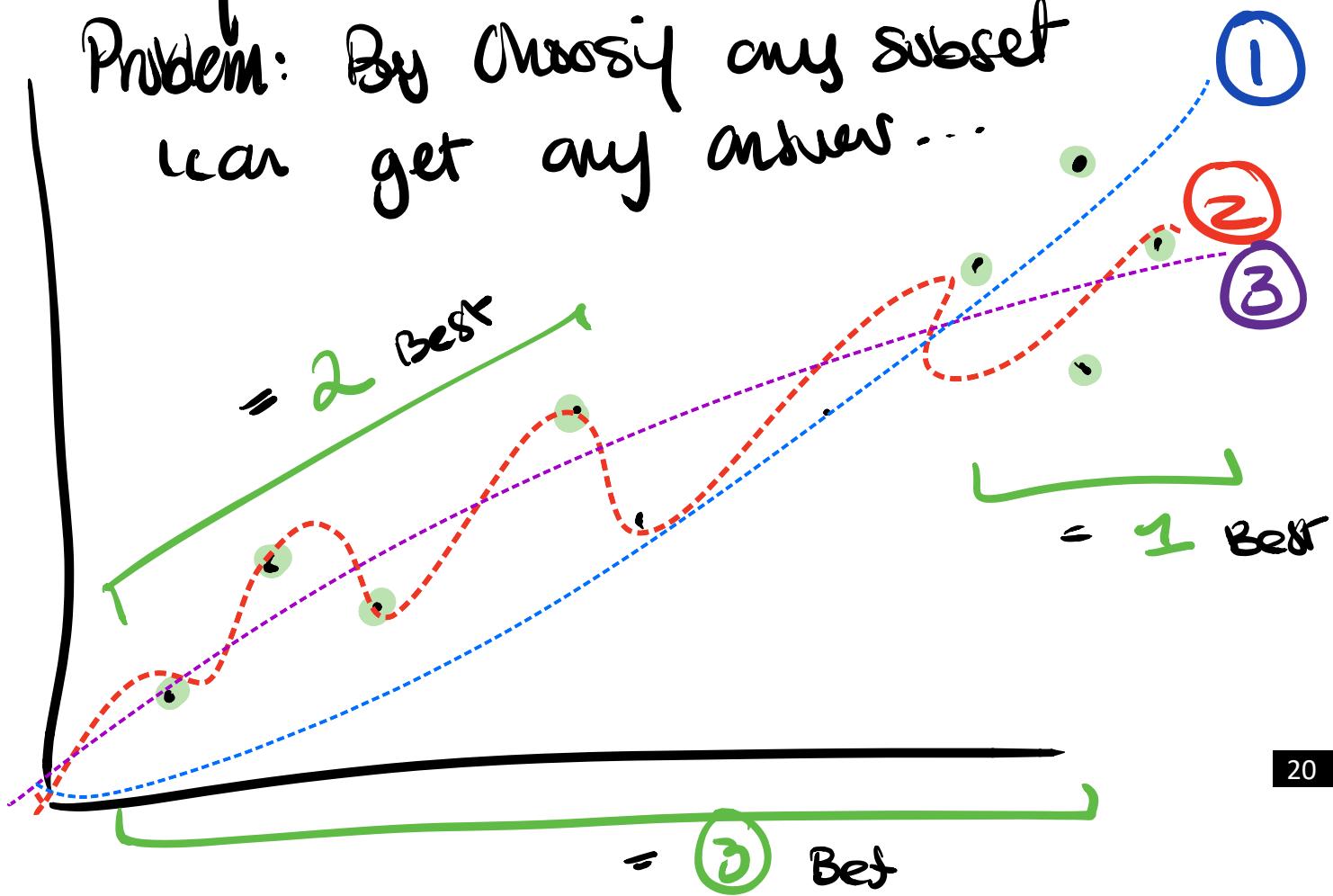
Try to Estimate



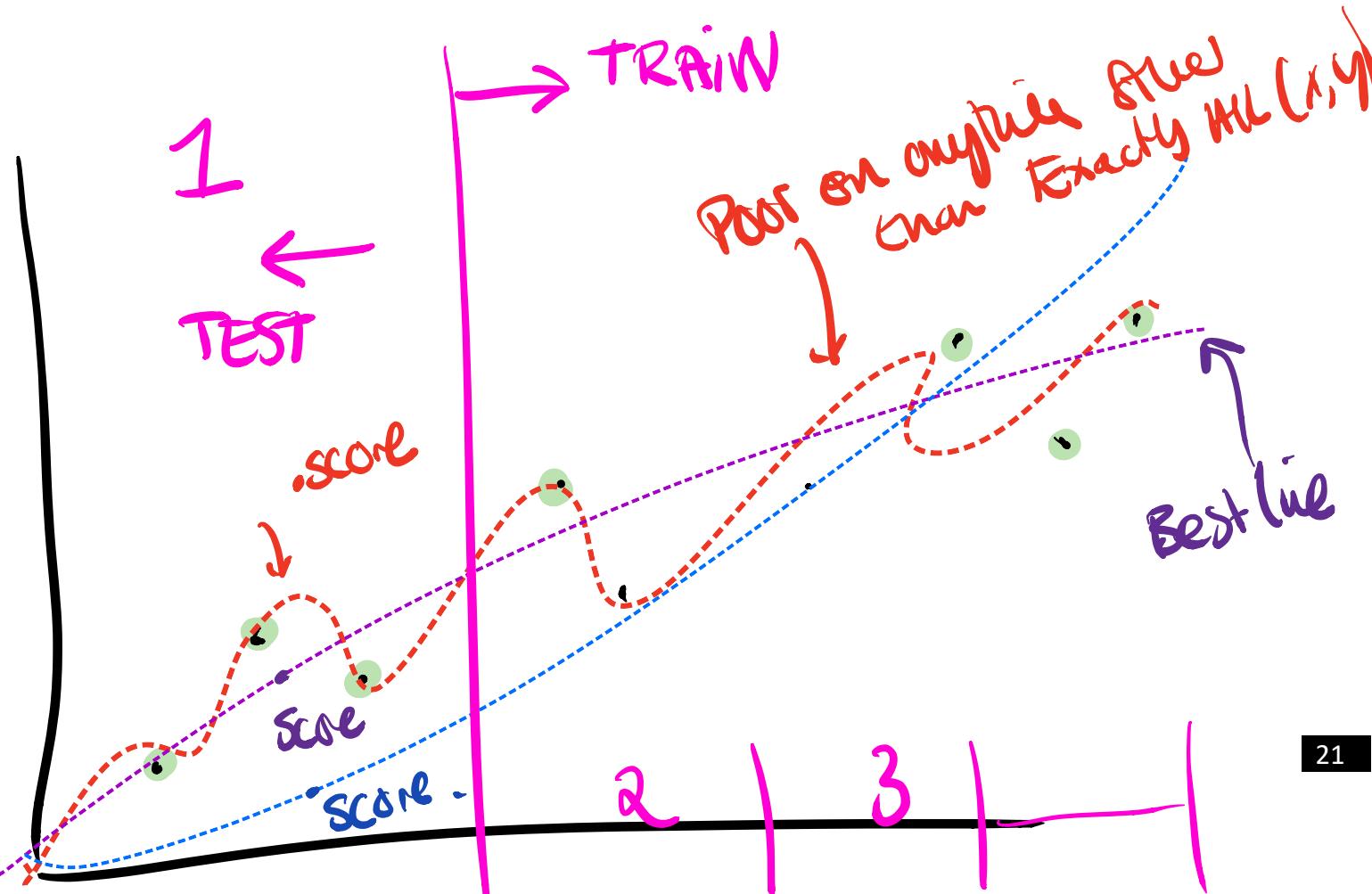


Choosing the Test Data

Problem: By choosing any subset
we can get any answer ...



Solwankhi : Cross Validation



Evaluation

Score ()

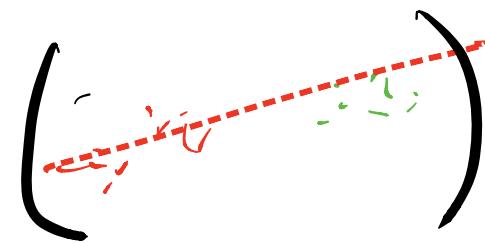
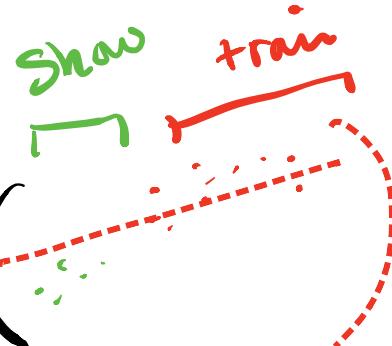
= Score ()

+

Score

+

... for several runs.



Model choice

~~choose~~

Best (Score)

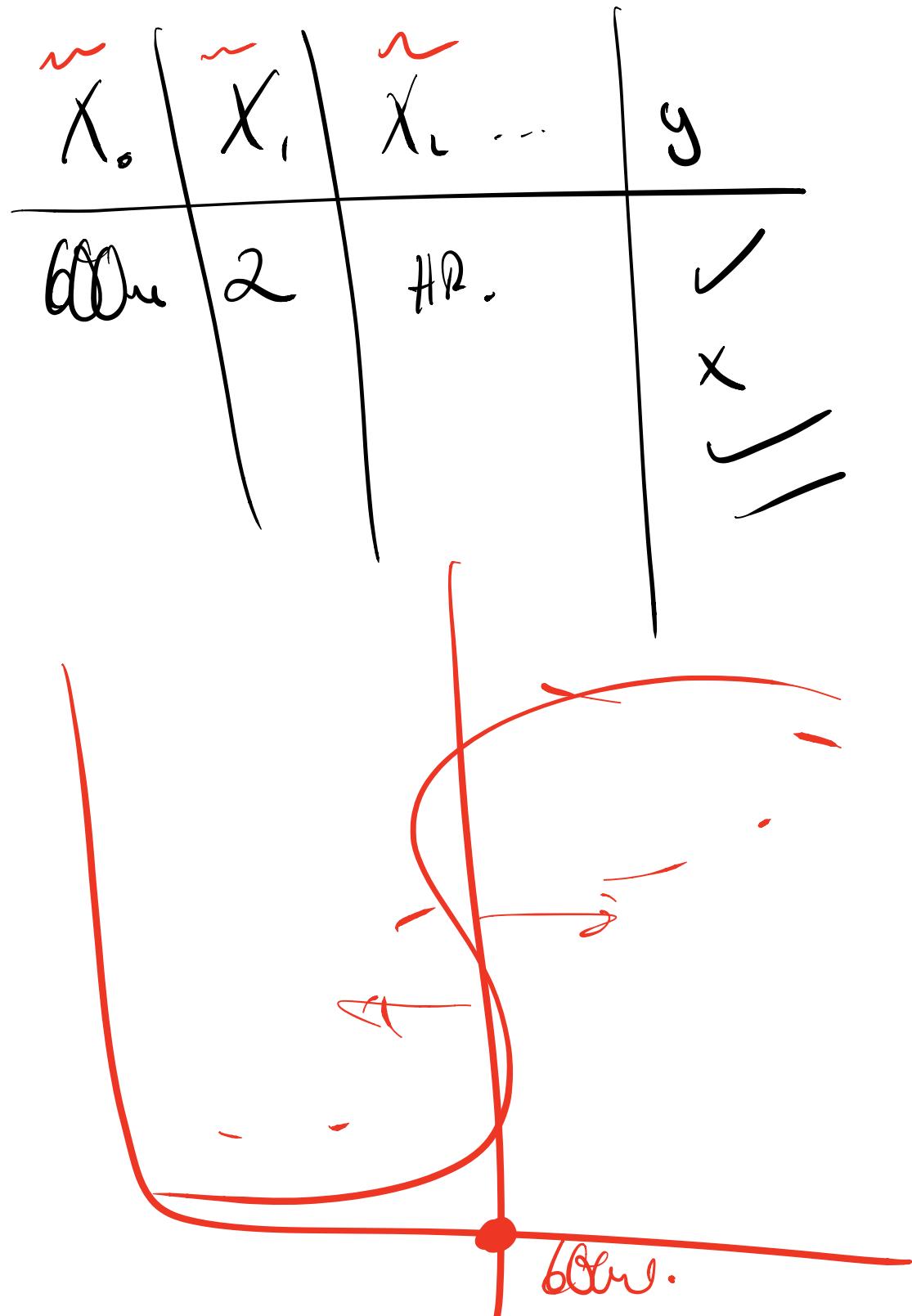


so long as you
“Score” correctly

Next Steps

NNs → 3blue 1 Brown
QA "Machine hearing"

Case Study.



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