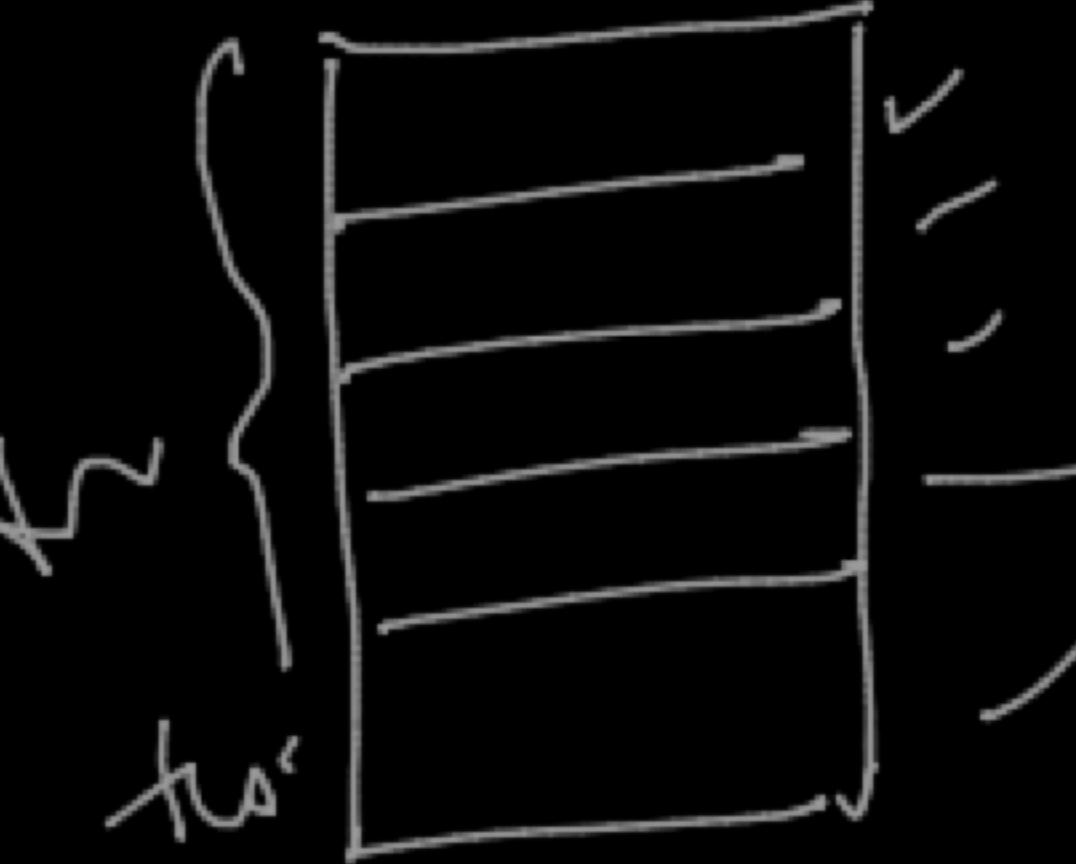
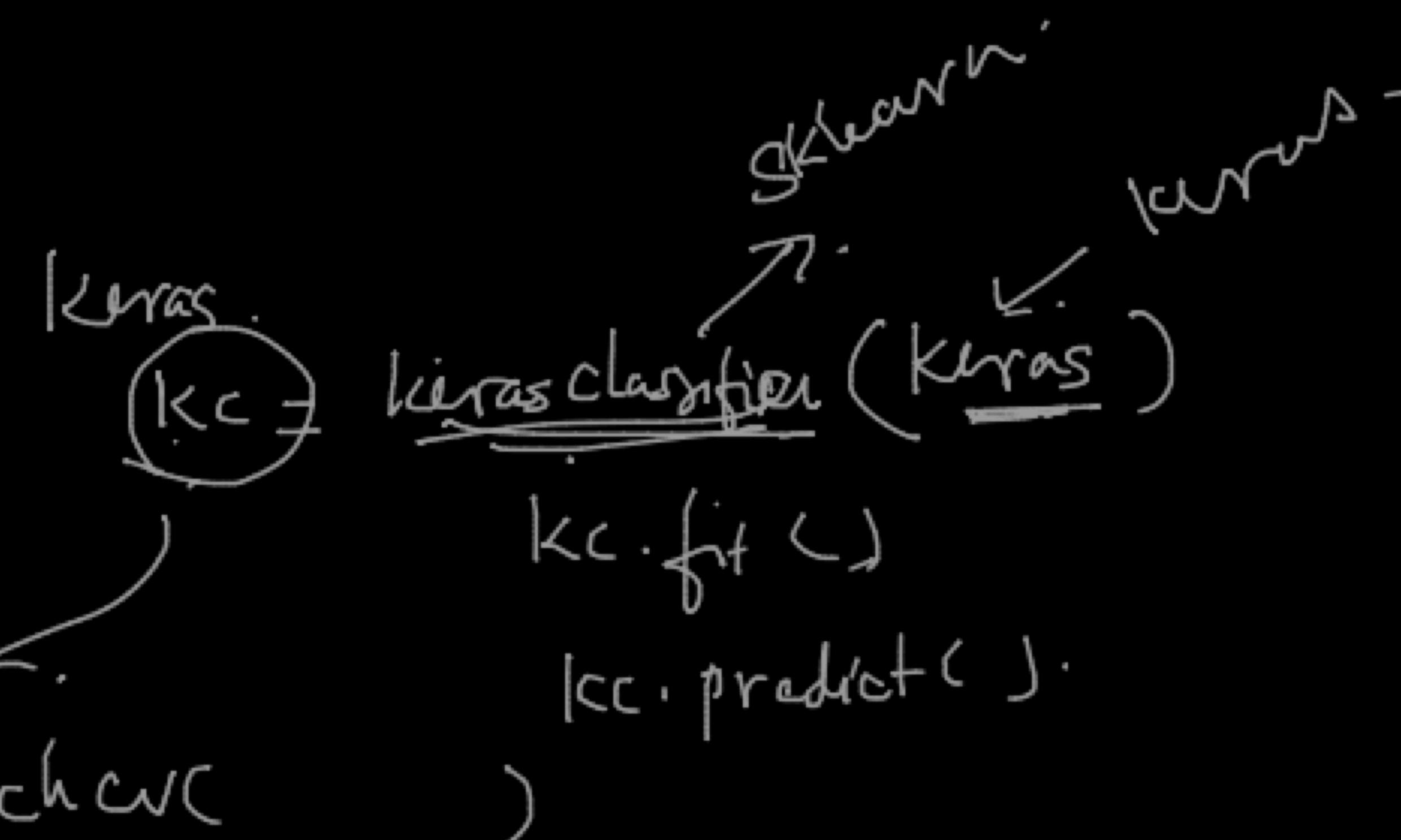


$K = 1, 2, 3$

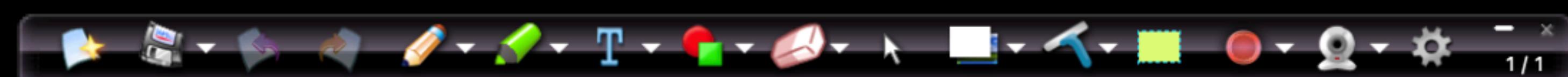
$V = 10, 20, 30$

Sklearn 

```
{ model( K=1, V=10 )  
  model.fit( train )  
  model.predict( testing ) → training error  testing error
```

keras
kc 
keras classifier(keras)
kc.fit()
kc.predict()

GridSearchCV



$$\begin{array}{l}
 w_1 \quad w_2 \quad w_3 \quad w_4 \\
 \rightarrow \quad 10 \quad 5 \quad 2.3 \quad 11 \quad \rightarrow \\
 \cdot \quad \cdot \quad \cdot \quad \cdot \\
 \checkmark \quad \cdot \quad \cdot \quad \cdot \\
 0 \quad 0 \quad 0 \quad 0
 \end{array}$$

`np.random.rand(10)`

1. Gradient Descent -

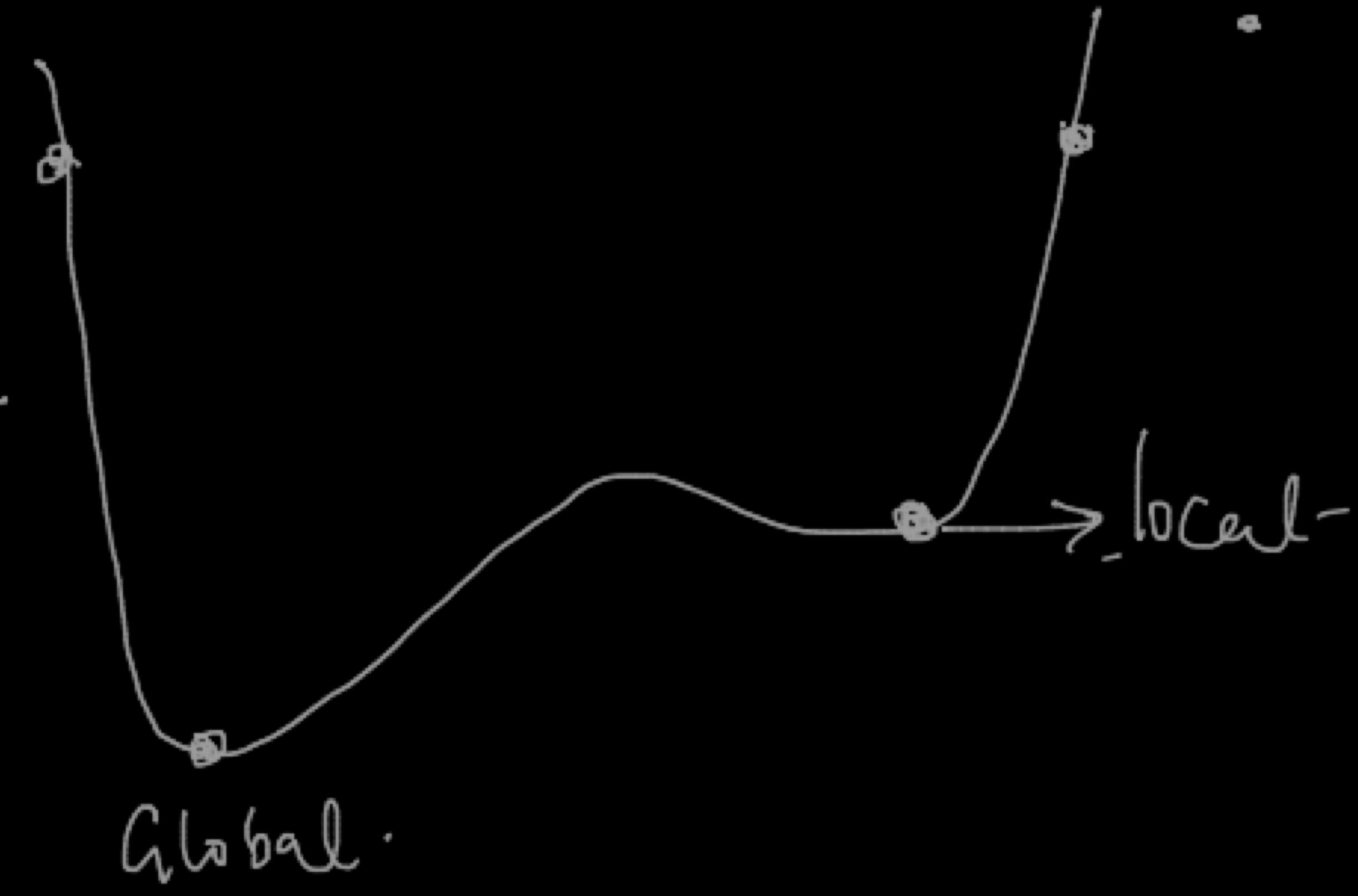
- forward prop. (activation f_v) -
- Back prop. (Chain Rule - weight update).
- Epochs (Batch size) .

— learning rate.

- optimizers. \leftarrow
- Momentum-
 - Nesterov momentum
 - Adam
 - RMSprop

1. Local minima -
 2. Exploding / Vanishing gradients.
 3. Saddle point -

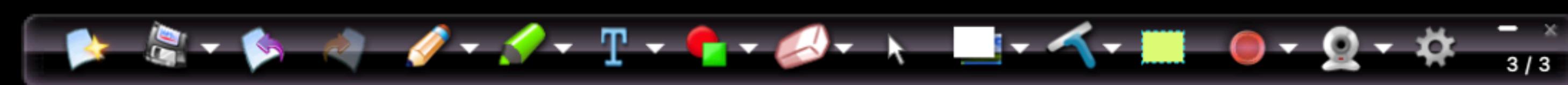
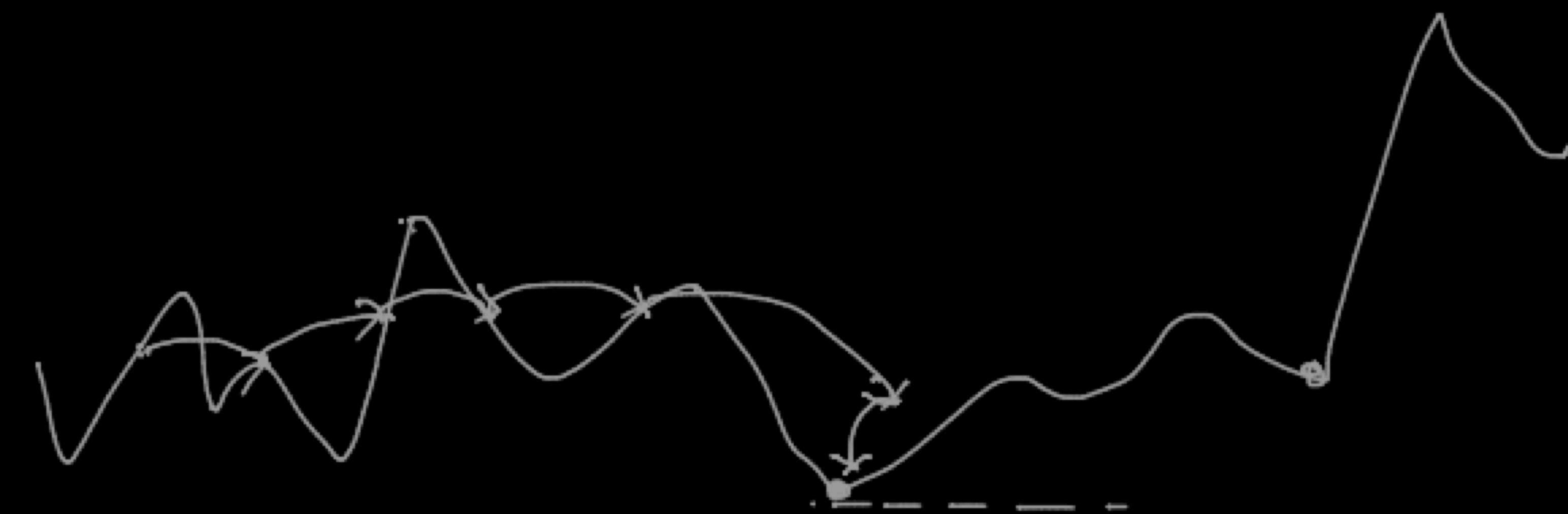


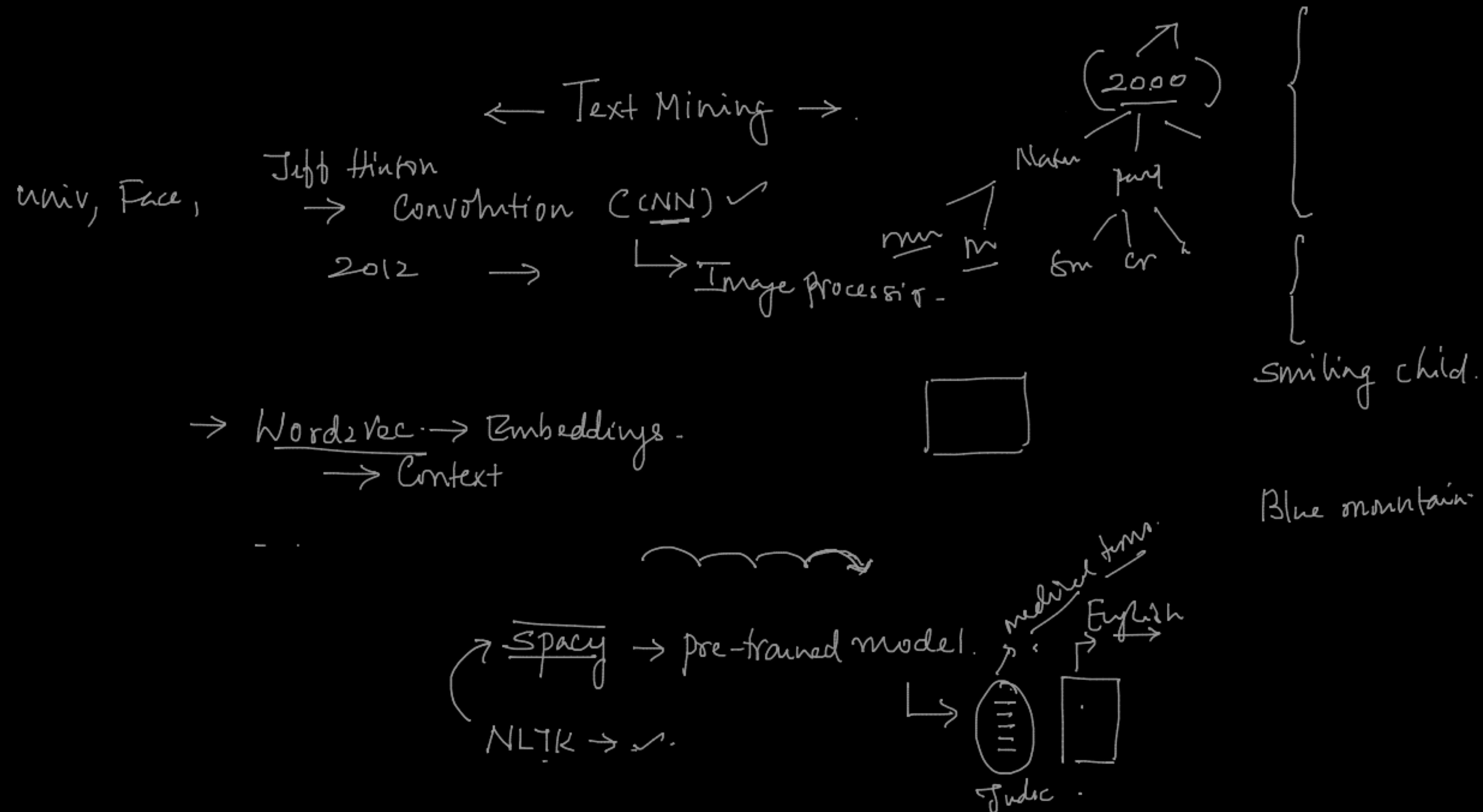


$$\rightarrow \left(\frac{\partial L}{\partial \cdot}\right)\left(\frac{\partial}{\partial \cdot}\right)\left(\frac{\partial}{\partial \cdot}\right)(\cdot)$$

Weight $\rightarrow 0$

Δw





First step → Convert text to vectors
 ↗ Classification

$$\mathbb{R}^l \rightarrow \begin{pmatrix} x_1 & x_2 & x_3 & \dots \\ (-) & (-) & (-) & \dots \\ - & - & - & \dots \\ - & - & - & \dots \end{pmatrix} \left| \begin{array}{c} y \\ p \\ N \end{array} \right.$$

- 1. Bag of Words } 'n-grams'
- 2. Binary BoW }
- 3. TF-IDF
 - Term Frey - Inverse Doc. Frey

Φ $n=1$; uni-gram
 $n=2$; bi-gram
 $n=3$; tri-gram

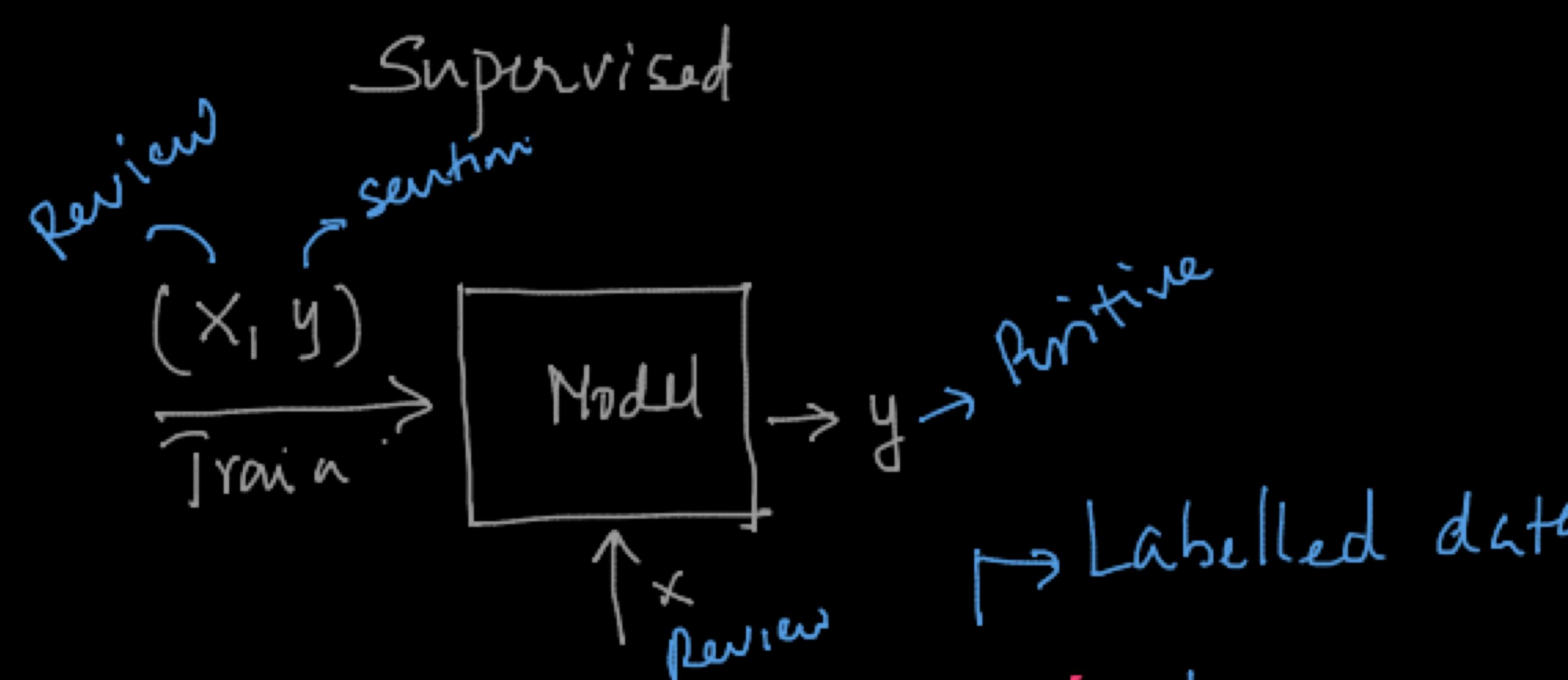
1. Bag of Words

Corpus

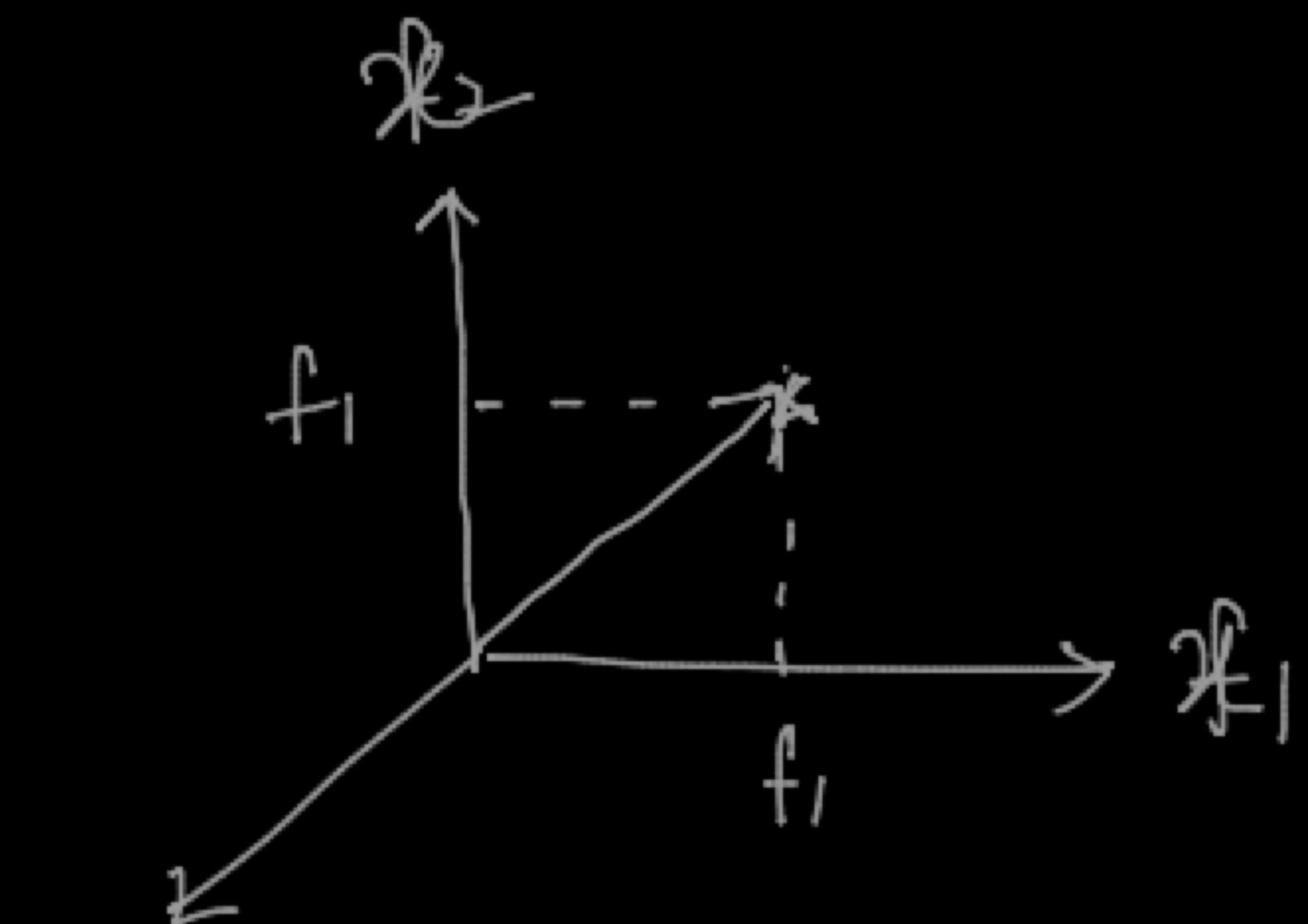
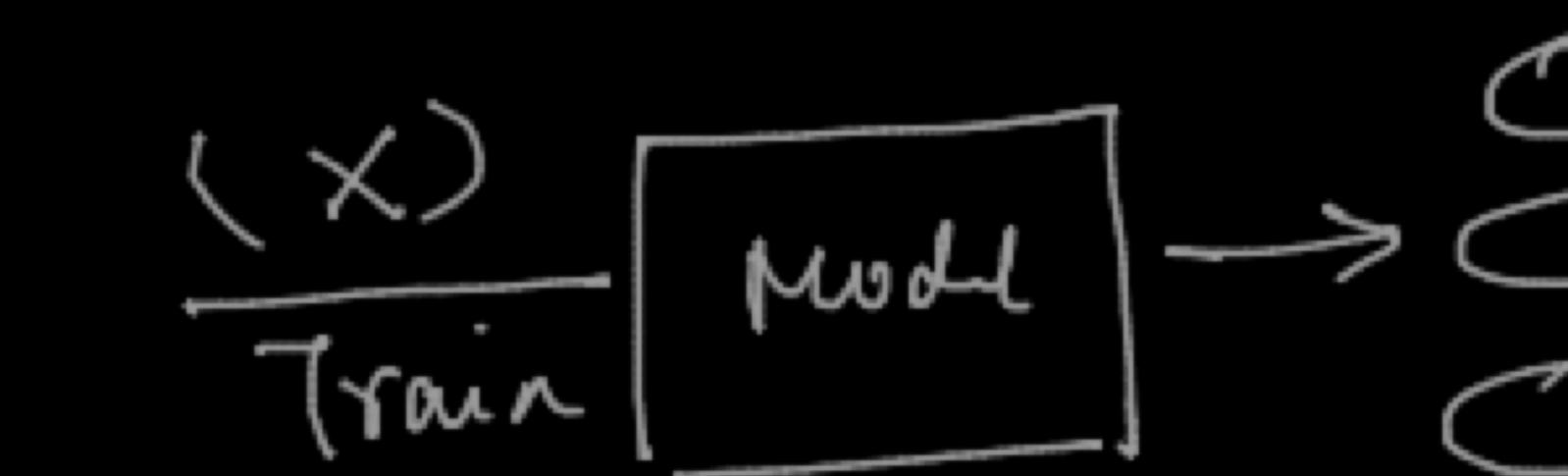
- ✓
- { D1: The car is driven on the road. ✓
- D2: The truck is driven on the highway

Vocab : The car truck is driven on road highway

R₁ : [2 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0]R₂ : [2 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | .]Regular Exp $\rightarrow [a-z][A-Z][0-9] \rightarrow$



Unsupervised



✓

| Review | Sentiment |
|------------------------------------|-----------|
| This is junk product Don't buy. | Neg |
| It is OK. But Expensive | Neutr |
| Excellent product | Positive |

250

| x_1 | x_2 | x_3 | x_4 | x_5 | y |
|-------|-------|-------|-------|-------|-----|
| 2 | 1 | 0 | 1 | 3 | N |
| 3 | 0 | 0 | 1 | 2 | P |
| 1 | 1 | 1 | 2 | 0 | Neu |

→ logist

→ SVM

— DT

:

98% good accuracy

$\eta \rightarrow 1, 2, 3, \dots$

Conjunctive
words { D1: Tom is not clever but he is honest.
D2: Jon is clever but not honest.

unigran

\rightarrow 1 w
n-gram

↳ bi-fram - (2)

in-trans

```
graph TD; A["not honest"] --- B["but not"]; B --- C["Jan is"]; C --- D["Tom is"]; D --- E["is not"]; E --- F["clever but"]; F --- G["but he"]; G --- H["he is"]; H --- I["is honest"]; I --- J["is clever"]
```

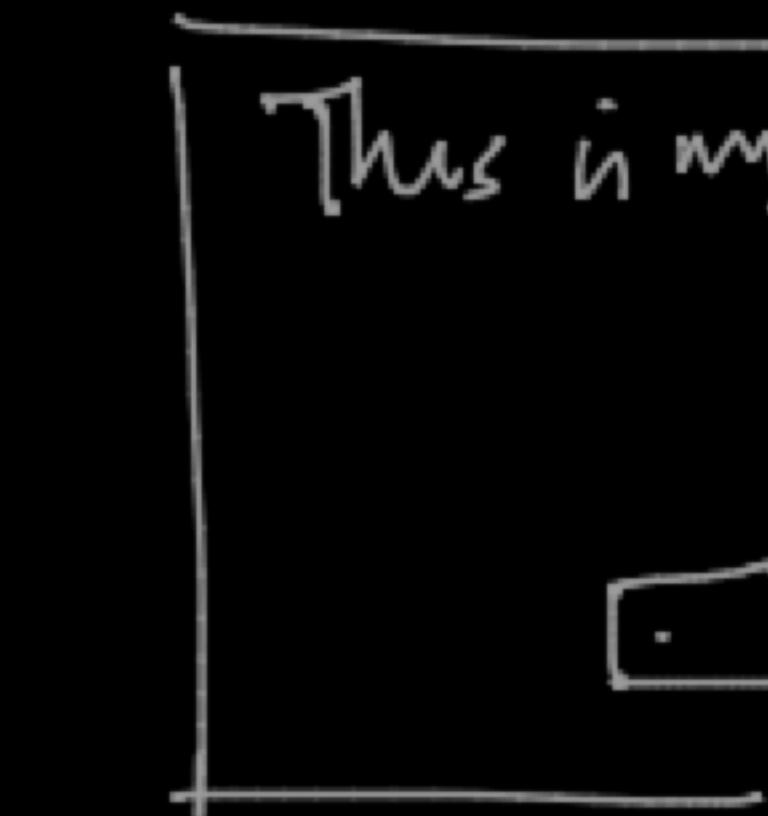
The diagram illustrates a logical structure. At the bottom left is a box labeled "not honest". An arrow points from this box to another labeled "but not". From "but not", an arrow points to a box labeled "Jan is". Another arrow points from "Jan is" to a box labeled "Tom is". From "Tom is", an arrow points to a box labeled "is not". From "is not", an arrow points to a box labeled "clever but". From "clever but", an arrow points to a box labeled "but he". From "but he", an arrow points to a box labeled "he is". Finally, an arrow points from "he is" to two boxes at the top right: "is honest" and "is clever".

$$x_1 \quad x_2 \quad x_3 \quad x_4 \quad x_5 = -$$

The image shows a digital whiteboard application. On the left, there is a large text input field containing the letters 'D' and '2'. To the right of this field is a toolbar with several icons: a yellow star, a blue document with a red checkmark, a blue document with a red X, a blue document with a green checkmark, a blue pencil, a green pencil, a blue 'T' icon, a red circle, a green square, a red eraser, a white square, a blue eraser, a green square, a red circle, a blue camera, and a gear icon.

GPT3 $\rightarrow \overline{1 \text{ Trillion}}$ \rightarrow

Pin



$\rightarrow 3000$ Reviews.

