

गुरुवार
Thursday

* Loss Functions

जनवरी
January

Functions used to calculate performance of the model we have created.

$$f(y, y^{\wedge}) = \text{error}$$

Loss function for Regression

- Mean Absolute Error
- Mean Squared Error
- Huber loss

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- Pseudo Huber Loss.

Loss fn for classification

- Hinge loss
- Cross Entropy loss

- Binary cross entropy
- categorical cross

Antropology

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Saturday

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Any option optimiser has a $\nabla_{\theta} J(\theta)$ or $\frac{\partial C}{\partial \omega}$

Loss function minimise

A) Regression

(i) MAE: Mean Absolute Error $\frac{1}{n} \sum |y_i - \hat{y}_i|$

norm loss function)

$$\frac{75}{3} = 25$$

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January

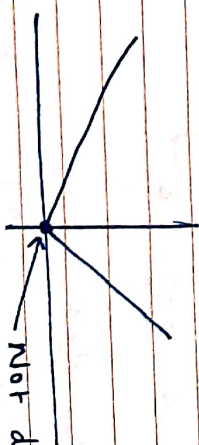
$$\frac{1}{n} \sum_{i=1}^n (y_i - \hat{y}_i)$$

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Disadvantage (1) It is not very useful

-able at every point.
It is a mod function

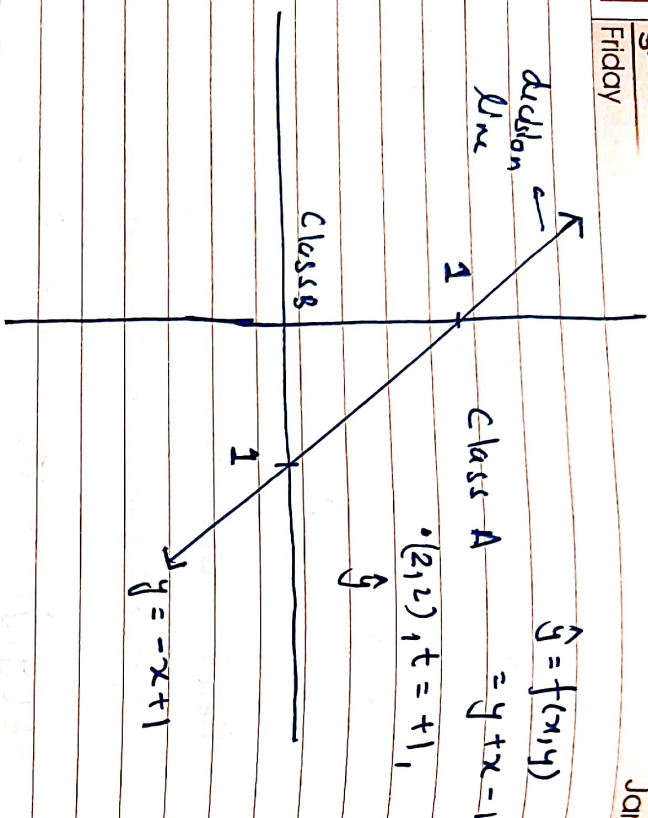


-at this point

2022

(5)

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If $y > 0 \Rightarrow$ class A $(+ve)$ other wise $-ve$ belongs to class B $(-ve)$

Case 1: $(2, 2)$ - Input point

$$\text{Actual value } (y) = f(2, 2) = 2 + 2 - 1 = 3$$

Predicted $(\hat{y}) = 3$

$$\text{Loss } (L) = \max(0, 1 - (+1)3)$$

$$= \max(0, -2)$$

Correct prediction = 0

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Case 2 Predicted $\hat{y} = -3$

$$L = \max(0, 1 - (+1)(-3))$$

$$= \max(0, 4) = 4 \rightarrow \text{Wrong Prediction}$$

② Cross Entropy Loss

$$CE = - \sum_{i=1}^C p \log(q)$$

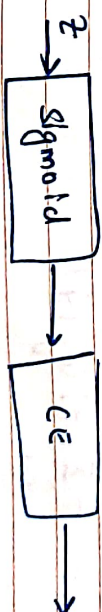
actual

probabilities

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③ Binary Cross Entropy Loss (Sigmoid Cross Entropy Loss)



$$BCE = - \sum_{i=1}^C y_i \log(\sigma(z_i))$$

$$= - \sum_{i=1}^2 y_i \log(\hat{y}_i)$$

$$BCE = - y_1 \log(\hat{y}_1) - y_2 \log(\hat{y}_2)$$

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