$$a_1 = \cancel{f}(z_1) = \frac{e^{z_1}}{\sum e^{z_i}} \quad 0 \text{ } \& \text{ } 1 \qquad 0 \text{ } \& \text{ } \infty$$

$$a_2 = \cancel{f}(z_2) = \frac{e^{z_2}}{\sum e^{z_i}} \quad 0 \text{ } \& \text{ } 1$$

$$a_3 = \cancel{f}(z_3) \quad \vdots$$

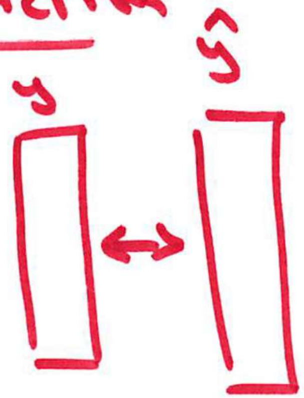
$$a_4 = \cancel{f}(z_4) \quad \vdots$$

$$a_5 = \cancel{f}(z_5) \quad \vdots$$

$$\checkmark \frac{\sum e^{z_i}}{\sum e^{z_i}} = 1$$

$$e^{z_1} \quad e^{z_2} \quad \ldots\ldots \quad e^{z_5}$$

Loss Function



Loss func → distance measure

↓

a 'norm'

$$\frac{1}{N}\sum |y_i - \hat{y}_i|$$

MAE

SAE

MAD

$$\frac{1}{N}\sum (y_i - \hat{y}_i)^2$$

↓

SSE

MSE

RMSE

Reg

Cross entropy

binary classificat.

Cross entropy $L = -\left(y_i \ln(\hat{y}_i) + (1-y_i)\ln(1-\hat{y}_i) \right)$

$$L = \begin{cases} -\ln \hat{y}_i & \text{if } y_i = 1 \\ -\ln(1-\hat{y}_i) & \text{if } y_i = 0 \end{cases}$$

truth	pred
1	0
0	1

$(\hat{y} - y)^2$

→ Reg → not a big deal cause you are 1 off. $(1-0)^2$

bin Class → $-\ln(0) \to \infty$

1	0.9
1	0.4

$\cancel{(\hat{y} - y)^2}$

$-\ln(1-1) \to \infty$