

Logistic Regression

Formula

$$\frac{d(L)}{dw_1} = (\hat{y} - y) \cdot x_1$$

$$\frac{d(L)}{db} = (\hat{y} - y) \cdot 1$$

Now,

x_1	x_2	y
0.5	1.2	0
1.0	0.8	0
1.5	1.3	1
2.0	1.7	1

i) just like linear regression, we will find $y = mx + c$ but like in terms of z and w .

2 features, so, $z = w_1 x_1 + w_2 x_2 + b$.

weight

↪ bias

$$\hat{y} = \frac{1}{1 + e^{-(z)}}$$

$$= \frac{1}{1 + e^{-(w_1 x_1 + w_2 x_2 + b)}}$$

Assumption,

$$w_1 = 0 \quad w_2 = 0 \quad b = 0 \quad \alpha = 0.01$$

আমাদের গুই Dataset ১০ input. আক. ২ টি.
and bias থাকে গুই. So, the formulas that
we are going to use is,

$$\frac{dL}{dw_1} = (\hat{y} - y) \cdot x_1$$

$$\frac{dL}{dw_2} = (\hat{y} - y) \cdot x_2$$

$$\frac{dL}{db} = (\hat{y} - y)$$

Finding the values of the formula:

$$\text{[scribble]} = (\hat{y} - y) \times_1$$

$$\textcircled{1} = \left(\frac{1}{1 + e^{-(0 \times 0.5 + 0 \times 1.2 + 0)}} - y \right) \times_1$$

$$= (0.5 - y) \times_1$$

$$= (0.5 - 0) (0.5)$$

$$= (0.5) (0.5)$$

$$= 0.25$$

$$\textcircled{3} (\hat{y} - y) \times_3$$

$$= (0.5 - \frac{1}{1}) (1.5)$$

$$= -0.75$$

$$\textcircled{4} (\hat{y} - y) \times_4$$

$$= \text{[scribble]} (0.5 - \frac{1}{1}) (2.0)$$

$$= -0.75 (-0.5) (2.0)$$

$$P = -1.5$$

$$\text{[scribble]} = (\hat{y} - y) \times_2$$

$$= (0.5 - 0) (0.10)$$

$$= 0.05$$

$$(y - \hat{y})x_2 \quad \text{and} \quad (\hat{y} - y)$$

$$(1) \quad .6$$

$$(2) \quad .4$$

$$(3) \quad -.65$$

$$(4) \quad -.85$$

$$(5) \quad -.85$$

$$(6) \quad -.85$$

$$(7) \quad -.85$$

$$(8) \quad -.85$$

$$\frac{dL}{dw_1} = \frac{1}{4} (.25 + .5 - .75 - 1)$$

$$= -.25$$

$$(9) \quad -.85$$

$$\frac{dL}{dw_2} = \frac{1}{4} (.6 + .4 - .65 - .85)$$

$$= -.125$$

$$(1) \quad .5$$

$$(2) \quad .5$$

$$(3) \quad -.5$$

$$(4) \quad -.5$$

$$(5) \quad -.5$$

$$(6) \quad -.5$$

$$(7) \quad -.5$$

$$(8) \quad -.5$$

$$(9) \quad -.5$$

$$(10) \quad -.5$$

$$(11) \quad -.5$$

$$(12) \quad -.5$$

$$(13) \quad -.5$$

$$(14) \quad -.5$$

$$(15) \quad -.5$$

$$(16) \quad -.5$$

$$\frac{dL}{db} = \frac{1}{4} (.5 + .5 - .5 - .5)$$

$$= 0.$$

$$w_1(\text{new}) = 0 - (-0.25 \times 0.01) = .0025$$

$$w_2(\text{new}) = 0 - (-0.125 \times 0.01) = .00125$$

$$b(\text{new}) = 0.$$