Gradient Descent

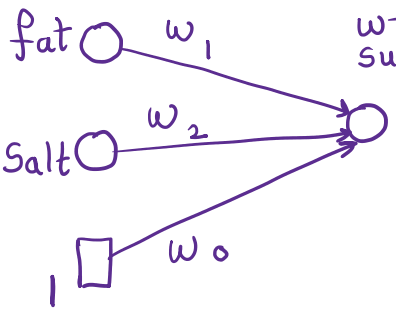
03 January 2023 15:42

Obs.	Fat	Salt	Acceptance	
1	0.2	0.9	like	1
2	0.1	0.1	dislike	0
3	0.2	0.4	dislike	0
4	0.2	0.5	dislike	0
5	0.4	0.5	like	1
6	0.3	0.8	like	0

$$y = \frac{1}{1 + e^{-(w_0 + w_1 fat + w_2 Salt)}}$$

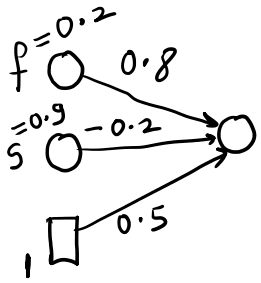
$$f(x) = \frac{1}{1 + e^{-x}}$$

Single Layer Perceptron



$wt_{sum} = w_0 + w_1 fat + w_2 salt$

1 epoch
= Traversal of entire dataset on the perceptron

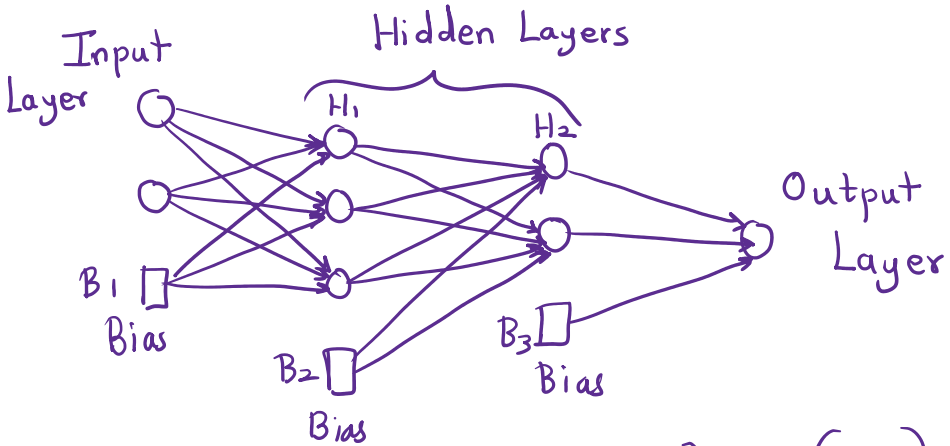


$wt_{sum} = 0.2(0.8) + 0.9(-0.2) + 1(0.5)$
$= 0.48$

$$Act = \frac{1}{1 + e^{-0.48}} = 0.6177 = P(y=1)$$

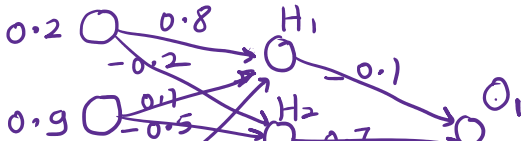
$y = 1 \qquad \hat{y} = 0.6177$

In case of Reg → error $= (1 - 0.6177)^2$ tol = 0.0001
Class → log loss $= \log_e(0.6177)$



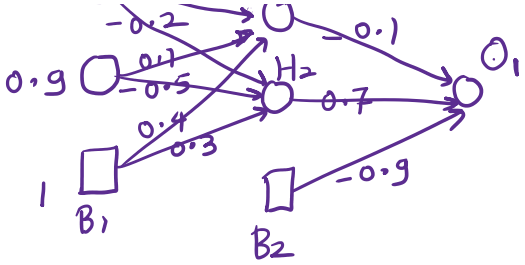
$Sum(H_2) = 0.2(-0.2) + 0.9(-0.5) + 1(0.3)$
$Act(H_2)$

Obs.	Fat	Salt	Acceptance
1	0.2	0.9	like



$Sum(O_1) = Act(H_1) * (-0.1) + Act(H_2) * (0.7)$

Obs.	Fat	Salt	Acceptance
1	0.2	0.9	like
2	0.1	0.1	dislike
3	0.2	0.4	dislike
4	0.2	0.5	dislike
5	0.4	0.5	like
6	0.3	0.8	like



$= Act(H_1) * (-0.1)$
$+ Act(H_2) * (0.7)$
$+ 1(-0.9)$
$Act(sum(O_1))$

$sum(H_1) = 0.2(0.8) + 0.9(0.1) + 1(0.4)$

$Act(sum(H_1)) =$

Forward Pass →

← Backpropogation / Backward Pass