

ASSIGNMENT- 5A

Iteration - 1 (Sample - 1)

x_i^a	y_i^a
75.1	577.8
74.3	577
88.7	570.9

S-1: $(75.1, 577.8)$, $\eta = 0.01$, epoch = 1,

$m = 1$, $c = -1$, iter = 1

$$S-2: \frac{\partial \epsilon}{\partial m} \bigg|_{m=1} = -\frac{1}{2} (y_i^a - mx_i^a - c) (x_i^a)$$

$$= -\frac{1}{2} [(577.8 - (1)(75.1) + 1)(75.1) + (577 - (1)(74.3) + 1)(74.3) + (570.9 - (1)(88.7) + 1)(88.7)]$$

$$= -59056.31$$

$$\frac{\partial \epsilon}{\partial c} \bigg|_{c=-1} = -\frac{1}{2} (y_i^a - mx_i^a - c)$$

$$= -\frac{1}{2} [(577.8 - (1)(75.1) + 1) + (577 - (1)(74.3) + 1) + (570.9 - (1)(88.7) + 1)]$$

$$= -745.3$$

$$S-3: \Delta m = -\eta \frac{\partial \epsilon}{\partial m}$$

$$= -(0.01) (-59056.31)$$

$$= 590.5631$$

$$\Delta c = -\eta \frac{\partial \epsilon}{\partial c}$$

$$= 7.453$$

$$S-4 \quad m = m + \Delta m$$

$$= 1 + (590.5631)$$

$$= 591.5631$$

$$C = C + \Delta C$$

$$= (-1) + (7.453)$$

$$= 6.453$$

$$S-5 \quad \text{iter} = \text{iter} + 1$$

$$= 1 + 1$$

$$= 2 > 1 \text{ (stop)}$$