# Assignment – 6A

|          | $x_i^a$ | $y_i^a$ |
|----------|---------|---------|
| Batch₁   | 1180    | 221900  |
|          | 2570    | 538000  |
| Batch₂   | 770     | 180000  |
|          | 1960    | 604000  |

step1 :- $(x_i^a, y_i^a)$, $\eta = 0.01$, epochs $= 1$, $m = -1$, $c = -1$, iter $= 1$, batch $= 1$

calculating gradient w.r.t m.c

$$\frac{\partial E}{\partial m} = \frac{-1}{bs} \sum_{i=1}^{bs} [(y_i^a - m x_i^a - c)(x_i^a)]$$

$$= -\frac{1}{2} \sum_{i=1}^{2} [(y_i^a - m x_i^a - c)(x_i^a)]$$

$$= -\frac{1}{2} [[221900 - (-1)(1180) - (-1)](1180)$$
$$+ (538000 - (-1)(2570) - (-1)](2570)]$$

$$= -\frac{1}{2} [(221900 + 1180 + 1)(1180)$$
$$+ (538000 + 2570 + 1)(2570)]$$

$$= -\frac{1}{2} [223081(1180) + 540571(2570)]$$

$$= -\frac{1}{2} [263235580 + 1389267470]$$

$$= -\frac{1}{2} (1652503050)$$

$$= - 826251525$$

$$\frac{\delta E}{\delta c} = -\frac{1}{bs} \sum_{i=1}^{bs} (y_i^a - m x_i^a - c)$$

$$= -\frac{1}{2} (223081 + 540571)$$

$$= -\frac{1}{2} (763652)$$

$$= -381826$$

$$\Delta m = -\eta \frac{\delta E}{\delta m}$$

$$= -(0.01)(-826251525)$$

$$= 8262515.25$$

$$\Delta c = -\eta \cdot \frac{\delta E}{\delta c}$$

$$= -(0.01)(-381826)$$

$$= 3818.26$$

$$m = m + \Delta m$$

$$= -1 + 8262515.25$$

$$= 8262514.25$$

$$\Delta c = c + \Delta c$$

$$= -1 + 3818.26$$

$$= 3817.26$$

batch = batch + 1 = 2

**Batch 2**

| $x_i^a$ | $y_i^a$ |
|---|---|
| 770 | 180000 |
| 1760 | 604000 |

$$\frac{\delta E}{\delta m} = -\frac{1}{bs} \sum_{i=1}^{bs} (y_i^a - m x_i^a - c)(x_i^a)$$