Assignment 3:-

1) m=1, c=-1, η=0.1, epochs=2, ns=2

X	Y
0.2	3.4
0.4	5.8

2) it=1

3) Sample=1

4) $\frac{\partial E}{\partial m} = -(y_i - mx_i - c)x_i$

$= -(3.4 - 1(0.2) - (-1))0.2$

$= -(3.4 - 0.2 + 1)0.2$

$\frac{\partial E}{\partial m} = -0.84$

$\frac{\partial E}{\partial c} = -(y_i - mx_i - c)$

$= -(3.4 - 1(0.2) - (-1))$

$\frac{\partial E}{\partial c} = -4.2$.

5) $\Delta m = -\eta \frac{\partial E}{\partial m} = -(0.1)(-0.84)$

$= +0.084$

$\Delta c = -\eta \frac{\partial E}{\partial c} = -(0.1)(-4.2)$

$= 0.42$

6) $m = m + \Delta m = 1 + 0.084 = 1.084$

$c = c + \Delta c = -1 + 0.42 = -0.58 = -0.58$

7) Sample = 1+1 = 2.

8) if(2>2) x

4) $\frac{\partial E}{\partial m} = -(y_i - mx_i - c)x_i$

$= -(3.8 - 1(0.4) - (-1))0.4$

$= -(4.4)0.4 = -1.76$

$\frac{\partial E}{\partial c} = -(y_i - mx_i - c)$

$= -(3.8 - 1(0.4) - (-1)) = -4.4$

5) $\Delta m = -\eta \frac{\partial E}{\partial m} = -(0.1)(-1.76)$

$= +0.176$

$\Delta c = -\eta \frac{\partial E}{\partial c} = -(0.1)(-4.4)$

$= +0.44$

6) $m = m + \Delta m = 1.084 + 0.176 = 1.26$

$c = c + \Delta c = -0.58 + 0.44 = -0.14$

7) Sample $= 1+1 = 3$

8) if $(3 > 2)$ ✓

9) it $= 1+1 = 2$

10) if $(2 > 2)$ ✗

3) Sample = 1

4) $\frac{\partial E}{\partial m} = -(y_i - mx_i - c)(x_i)$

$= -(3.4 - 1.26(0.2) - (-0.14))0.2$

$= -(3.4 - 0.256 + 0.14)0.2$

$= -(3.284)0.2 = -0.6568$

$\frac{\partial E}{\partial c} = -(3.4 - 1.26(0.2) - (-0.14))$

$= -3.284$

5) $\Delta m = -\eta \frac{\partial E}{\partial m} = -(0.1)(-0.6568)$

$= +0.06568$

$\Delta c = -\eta \frac{\partial E}{\partial c} = -(0.1)(-3.284)$

$= +0.3284$

6) $m = m + \Delta m = 1.26 + 0.06568$

$= 1.325$

$c = c + \Delta c = +0.14 + 0.3284$

$= 0.188$

7) Example 1+1 = 2

8) if (2>2)*

↳ 4) $\frac{\partial E}{\partial m} = -(3.8 - 1.325(0.4) - 0.188)0.4$

$= -(3.8 - 0.53 - 0.188)0.4$

$= -(3.082)0.4 = -1.232$

$\frac{\partial E}{\partial c} = -(3.8 - (1.325)(0.4) - 0.188)$

$= -(3.082)$

5) $\Delta m = -\eta \frac{\partial E}{\partial m} = -(0.1)(-1.232)$

$= 0.1232$

$\Delta c = -\eta \frac{\partial E}{\partial c} = -(0.1)(-3.082)$

$= 0.3082$

6) $m = 1.325 + 0.1232 = 1.448$

$c = 0.188 + 0.3082 = 0.4968$

7) Example = 2+1 = 3

8) if (3 > 2) ✓

9) if = 2+1 = 3

10) if (3 > 2) ✓

11) m = 1.44k , c = 0.496