Assignment 3. HT NO: 18K41A0CA5.

Manual calculations for 2 iterations with first 2 samples.

Sample (i)	x_i a	y_i a
1	0.2	3.4
2	0.4	3.8
3	0.6	4.2
4	0.8	4.6.

Step 1: initializing

$x, y, m = 1, c = -1, \eta = 0.1$, epochs = 2,

$ns = 2$

Step 2: $itr = 1$

Step 3: Sample = 1

Step 4: $\frac{\partial \epsilon}{\partial m} = -(3.4 - (1))(0.2) + (-1))0.2$

$= -0.84$

$\frac{\partial \epsilon}{\partial c} = -(3.4 (1))(0.2 + 1)$

$= +4.2$

Step 5: $\Delta m = -(0.1)(-0.84) = 0.084$

$\Delta c = -(0.1)(-4.2)$

$= 0.42$

Step 6: $m = m + \Delta m = 1 + 0.084$

$\boxed{m = 1.084}$

$c = c + \Delta c$

$= -1 + 0.42$

$= -0.58$

Step 7: Sample $= 1 + 1 = 2$

Step 8: if (sample > ns)

$2 > 2$.

false

Go to step 4.

Step 4: $\frac{\partial E}{\partial m} = -(3.8 - (1.084)(0.4) + 0.58)\,0.4$

$= -1.5785$

$\frac{\partial E}{\partial c} = -(3.8 - (1.084)(0.4) + 0.58)$

$= -3.9464$.

Step 5: $\Delta m = -(0.1)(-1.5785) = 0.1578$

$\Delta c = -(0.1)(-3.9464) = 0.3946$.

Step 6: $m = m + \Delta m = 1.2418$ $\Rightarrow$ $m = 1.2418$

$c = -0.58 + 0.3946$

$c = -0.1854$

Step 7: Sample $= 2 + 1 = 3$

Step 8: if $(3 > 2)$ True.

Go to step 9

step 9: itr += 1
= 2.

step 10: if (itr > epoches)
2 > 2.
Goto step 3.

step 3: Sample = 1

step 4: $\frac{\partial E}{\partial m} = -(3.4 - (1.2)(0.2) + 0.18)0.2$
$= -(3.34)0.2$
$= -0.668$

$\frac{\partial E}{\partial c} = -(3.4 - (1.2)(0.2) + 0.18)$
$= -3.34$

step 5: $\Delta m = -(0.1)(-0.668)$
$= 0.0668$

step 6: $m = 1.24 + 0.066 = 1.3$
$c = 0.18 + 0.33 = 0.15$

step 7: Sample = 1 + 1 = 2.

step 8: if (Sample > ns)
2 > 2.
Goto step 4

step-4: $\frac{\partial E}{\partial m} = -(3.8 - (1.3)(0.4) - 0.15)0.4$
$= -1.25$

$\frac{\partial E}{\partial c} = -(3.8 - (1.3)(0.4) - 0.15)$
$= -3.13.$

Step5: $\Delta m = -(0.1)(-1.25) = 0.12$

$\Delta c = -(0.1)(-3.13) = 0.31$

Step6: $m = 1.3 + 0.12 = 1.42$

$c = 0.15 + 0.31 = 0.46$

Step 7: Sample = 2 + 1 = 3

Step 8: if (sample > ns)

3 > 2

goto step 9

Step 9: itr = 2 + 1 = 3

Step 10: if (itr > epoches)

3 > 2

goto step 11

Step 11:

$m = 1.42$, $c = 0.46$.