Manual calculation.

Data :

X	Y
7.6	157
7.1	174

eqn : $y = mx + c$

step 1 : intialize ⇒ $m = 1$, $c = -1$, epochs = 2, $n = 0.1$, ns = 2

step 2 : iter = 1

step 3 : sample = 1

step 4 : $\dfrac{d\epsilon}{dm} = -(y - mx - c)x$

$= -(157 - (1)(7.6)) - (-1) 7.6$

$= -(157 - 7.6 + 1) 7.6$

$= -(150.4) 7.6 = -1143.04$

$\dfrac{d\epsilon}{dc} = -(y - mx - c)$

$= -(150.4)$

step 5 :- $\Delta m = -n\left(\dfrac{d\epsilon}{dm}\right) = -(0.1)(-1143.04)$

$= 114.3$

$\Delta c = -n\left(\dfrac{d\epsilon}{dc}\right) = -(0.1)(-150.4)$

$= 15.04$

step 6 : $m = m + \Delta m = 1 + 114.3 = 115.3$

$c = c + \Delta c = -1 + 15.04 = 14.04$

step 7 : sample + = 1 (sample = 2)

2 ≤ 2

step 8 : if $(i \leq ns)$ ↳ true

goto step 4

step 4 : $\dfrac{df}{dm} = -(y - mx - c)x$

$= -(174 - (115.3)(7.1) - (4.04)) \, 7.1$

$= -(174 \cdot 818 \cdot 63 - 14.04) \, 7.1$

$= 4676.5$

$\dfrac{df}{dc} = -(y - mx - c)$

$= -(174 - (115.3)(7.1) - 14.04)$

$= 658.67$

step 5 : $\Delta m = -n\left(\dfrac{df}{dm}\right) = -(0.1)(4676.5)$

$= -467.65$

$\Delta c = -n\left(\dfrac{df}{dc}\right) = -(0.1)(658.67)$

$= -65.8$

step 6 : $m = m + \Delta m = 115.3 - 467.65$

$= -352.35$

$c = c + \Delta c = 14.04 - 65.8$

$= -51.76$

step 7 : sample $+= 1$ (sample $= 3$)

step 8 : if $(r <= ns)$ $3 \not\le 2$

   ↳ false

    go to step 9

step 9 : iter $+= 1$ (iter $= 2$)

step 10 : if (iter^2 $<=$ epochs^2)

    ↳ true (go to step 3)

step 3 : sample $= 1$

step 4 : gradient calculation.

step 5 : step length calculation.

step 6 : update the model parameters

step 7 : sample $= 2$.

→ for and iteration

Step 9 : iter = 3

Step 10 : if (iter^{-3} $\angle$ = epochs^{2})
$\quad\quad\quad\quad\quad\quad\quad\quad$ └→ False (go to next step)

Step 11 :
$\quad\quad\quad\quad$ print model parameters and errors

Step 12 : Deployment