18K41A04F7

Assignment-2

Step1: $f(x,y) = x^2+y^2+10$

$$\frac{\partial f}{\partial y} = 2x \quad , \quad \frac{\partial f}{\partial y} = 2y$$

Step2:- $x = -1$

$y = 2$

$\eta = 0.01$

iter = 1

epochs = 2

Step3:-

$$\frac{\partial f}{\partial x} = 2x = 2(-1) = -2$$

$$\frac{\partial f}{\partial y} = 2y = 2(2) = 4$$

Step4:- $\Delta x = -\eta \frac{\partial f}{\partial x} = -(0.01)(-2)$

$= 0.02$

$\Delta y = -\eta \frac{\partial f}{\partial y} = -(0.01)(4)$

$= -0.04$

Step5:- $x = x + \Delta x$

$x = -1 + 0.02$

$x = -0.98$

$y = y + \Delta y$

$y = 2 + (-0.04)$

$y = 1.96$

Step 6 :- $itr = itr + 1 = 1 + 1 = 2$

$itr = 2 \leq$ epochs (next step-3)

Step 7 :- $\frac{\partial f}{\partial x} = 2(-0.98) = -1.96$

$\frac{\partial f}{\partial y} = 2(1.96) = 3.92$

Step 8 :- $\Delta x = -\eta \frac{\partial f}{\partial x} = -(0.01)(-1.96)$

$= 0.0196$

$\Delta y = -\eta \frac{\partial f}{\partial y} = -(0.01)(3.96)$

$= -0.0392$

Step 9 :- $x = x + \Delta x = -0.98 + (0.0196)$

$= -0.9604$

$y = y + \Delta y = 1.96 + (-0.0392)$

$= 1.9208$

Step 10 :- $itr = itr + 1 = 2 + 1 = 3 >$ epochs

Step 11 :- $f(x, y) = (0.0196)^2 + (0.0392)^2 + 10$

$f(x, y) = 10.0019208$ for 2 iterations