Assignment - 2 :-

Given : $x^2 + y^2 + 10$

step-1 :- $x = 1, y = 1, \eta = 0.1$, epoches = 2

step-2 :- iter = 1

s-3 :- $\frac{\partial f}{\partial x} = 2x = 2(1) = 2$

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

s-4 :- $\Delta x = -\eta \cdot \frac{\partial f}{\partial x} = -(0.1)(2) = -0.2$

$\Delta y = -\eta \cdot \frac{\partial f}{\partial y} = -(0.1)(2) = -0.2$

s-5 :- $x = x + \Delta x = 1 - 0.2 = 0.8$

$y = y + \Delta y = 1 - 0.2 = 0.8$

s-6 :- iter = iter + 1 = 1 + 1 = 2

s-7 :- if (iter > epochs)

goto step 8

else

goto step 3

s-3 :- $\frac{\partial f}{\partial x} = 2x = 2(0.8) = 1.6$

$\frac{\partial f}{\partial y} = 2y = 2(0.8) = 1.6$

s-4 :- $\Delta x = -\eta \cdot \frac{\partial f}{\partial x} = -(0.1)(1.6) = -0.16$

$\Delta y = -\eta \cdot \frac{\partial f}{\partial y} = -(0.1)(1.6) = -0.16$

S-5 :- $x = x + \Delta x$

$x = 0.8 - 0.16$

$x = 0.64$

$y = y + \Delta x$

$= 0.8 - 0.16$

$y = 0.64$

S-6 :- iter = iter + 1 = 2 + 1 = 3

S-7 :- if (iter > epoch)

$3 > 2$

goto step-8

S-8 :- $x = 0.64$

$y = 0.64$

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

$= (0.64)^2 + (0.64)^2 + 10$

$= 0.4 + 0.4 + 10$

$= 10.8$