Assignment - 2

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

Do manual calculations for two iterations

Step 1:- $m=1, c=-1, \eta=0.1$, epoch $=2, x=2, y=3$

Step 2:- iter $= 1$

Step 3:- $\left.\frac{\partial f}{\partial x}\right|_{x=2} = 2x = 2(2) = 4$

$\left.\frac{\partial f}{\partial y}\right|_{y=3} = 2y = 2(3) = 6$

Step 4:- $\Delta x = -\eta \frac{\partial f}{\partial x} = -(0.1)(4) = -0.4$

$\Delta y = -\eta \frac{\partial f}{\partial y} = -(0.1)(6) = -0.6$

Step 5:- $x = x + \Delta x = 2 - 0.4 = 1.6$

$y = y + \Delta y = 3 - 0.6 = 2.4$

Step 6:- iter $= 2$

Step 7:- if (iter > 2)

Step 8

else

Step 3

Step 3:- $\left.\frac{\partial f}{\partial x}\right|_{x=1.6} = 2(1.6) = 3.2$

$\left.\frac{\partial f}{\partial y}\right|_{y=2.4} = 2(2.4) = 4.8$

1.6 × 2 = 3.2

2.4 × 2 = 4.8

Step 4:- $\Delta x = -\eta \frac{\partial f}{\partial x} = -(0.1)(3.2) = 0.32$

$\Delta y = -\eta \frac{\partial f}{\partial y} = -(0.1)(4.8) = 0.48$

1.6 + 0.3 = 1.9

2.4 + 0.4 = 2.8

Step 5:- $x = x + \Delta x = 1.6 + 0.32 = 1.9$

$y = y + \Delta y = 2.4 + 0.48 = 2.8$

Step 6:- itcr = 3

Step 7:- if (3 > 2)

Step 8

Step 8:- $x = 1.9, \; y = 2.8$