Assignment 2!

Find the global minimum point and value for the function $f(x,y) = x^2 + y^2 + 10$.

Step 1: $x = 1$, $y = 1$, $\eta = 0.1$, epochs $= 2$.

Step 2: ita $= 1$

Step 3: $\dfrac{\partial f}{\partial x} = 2x = 2$

$\dfrac{\partial f}{\partial y} = 2y = 2$

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

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

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

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

Step 6: iter $=$ iter $+ 1 = 1 + 1 = 2$

Step 7: if (iter $>$ epochs)

$2 \not> 2$

goto step 3

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

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

Step 4: $\Delta x = -\eta \dfrac{\partial f}{\partial x} = -(0.1)(-1.6) = 0.16$

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

Step 5: $x = x + \Delta x = -0.8 + 0.16 = -0.64$

$y = y + \Delta y = 0.8 - 0.16 = 0.64$

Step 6: $ite = ita + 1 = 2 + 1 = 3$

Step 7: if (its > epochs)

$3 > 2$

goto next step

Step 8: $x, y = -0.64, 0.64$

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

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

$f(x, y) = 10.81$