18K41A04D0

Assignment-2:-

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

Do manual calculation for 2 iterations

step1): $x=-1, y=1, \eta=0.1$, epochs = 2.

2) iter = 1

3) $\frac{\partial f}{\partial x} = 2x = -2$ $\quad \frac{\partial f}{\partial y} = 2y = 2$

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

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

5) $x = x + \Delta x = -1 + 0.2 = -0.8$

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

6) iter = iter + 1 = 1 + 1 = 2

7) if (iter > epochs)

2 > 2.

false

goto step 3

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

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

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

$\Delta x = 0.16$

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

5) $x = x + \Delta x = -0.8 + 0.16 = -0.64$

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

6) iter = iter + 1 = 2 + 1 = 3.

7) if (iter > epochs)

3 > 2.

true.

goto next step.

8) print x, y values, $f(x, y)$

$x = -0.64$

$y = 0.64$

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

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

$f(x, y) = 10.81$