Assignment-2

18K41A0420

Find global minimum point & value for function $F(x,y) = x^2+y^2+10$.

→ DO manual calculations for 2 iterations.

step1: $x=-1$ $y=+1$ $\eta=0.1$ epoches = 2

step2: iter = 1

step3: $\frac{\partial f}{\partial x} = 2x = -2$

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

step4: $dx = -\eta\frac{\partial f}{\partial x} = -2(-0.1)$
$= 0.2$

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

step5: $x = x+\Delta x = -1+0.2 = -0.8$

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

step6: iter = iter+1 = 1+1 = 2

step7: if (iter > epoch 5)
goto step 5
else
goto step 3

step3: $\frac{\partial f}{\partial x} = 2x = 2(-0.8) = -1.6$

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

step4: $\Delta x = -\eta\frac{\partial f}{\partial x}$
$= -(0.1)(-1.6) = 0.16$

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

step5: $x = x + \Delta x$

$= -0.8 + 0.16 \Rightarrow -0.64$

$y = y + \Delta y$

$= 0.8 - 0.16 \Rightarrow 0.64$

step6: $itr = itr + 1 = 2 + 1 \Rightarrow 3$

step7: if (itr > epochs)

3 > 2

goto step 8

else: goto step 3

step8: $x = -0.64$

$y = 0.64$

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

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

$= 0.4 + 0.4 + 10$

$= 10.8$ //