Assignment-2

★ Find the global minimum point and value for function $f(x,y)$.

$= x^2+y^2+10$

→ Do Manual calculations for two iterations

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

step2 : iter = 1

step3 ; $\frac{\partial f}{\partial x} = 2x = 2$

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

step4 : $dx = -\eta \frac{df}{dx} = 0 - 2(-0.1)$

$= 0.2$

$\Delta y = -\eta \frac{df}{dy} = -(0.1)(2)$

$= -0.2$

step5 ; $x = x+\Delta x \Rightarrow -1+0.2 = -0.8$

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

step6 ; iter = iter + 1 = 1+1 = 2

step7 ; if (iter > epoches)

goto step 8

else

goto step 3

step3 : $\partial f/dx = 2x = 2(-0.8) = -1.6$

$\partial f/dy = 2y = 2(0.8) = 1.6$

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

$\Delta y = -\eta \partial f/\partial y = -(0.1)(1.6) = -0.16$

step5 : $x = x+\Delta x \Rightarrow -0.8+0.16 \Rightarrow -0.64$

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

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

step7 : if (iter > epoches)

$3 > 2$

goto step 8

else : goto step 3

step 8 : $x = -0.64$

$y = 0.64$

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

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

$+ 10$

$0.4 + 0.4 + 10$

$= 10.8$

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