ASSIGNMENT - 3

$f(x,y) = 3x^2 + 5e^{-y} + 10$

$n = 0.01, x = 2, y = 2,$ epochs $= 100,$ iteration $= 1$

Iteration - 1

$$\left.\frac{\partial f}{\partial x}\right|_{x=2} = 6x = 6(2) = 12$$

$$\left.\frac{\partial f}{\partial y}\right|_{y=2} = -5e^{-2} = -0.24$$

$$\Delta x = -\eta\left.\frac{\partial f}{\partial x}\right|_{x=2} = -(0.01)(12) = -0.12$$

$$\Delta y = -\eta\left.\frac{\partial f}{\partial x}\right|_{y=2} = -(0.01)(-0.24) = 0.0024$$

$$x = x + \Delta x = 2 - 0.12 = 1.88$$

$$y = y + \Delta y = 3 + 0.0024 = 3.0024$$

Iteration - 2

$$\left.\frac{\partial f}{\partial x}\right|_{x=1.88} = (6)(1.88) = 11.28$$

$$\left.\frac{\partial f}{\partial y}\right|_{y=3.002} = 5 \times e^{-3.002} = -0.24$$

$$\Delta x = -\eta\left.\frac{\partial f}{\partial x}\right|_{x=2} = -(0.01)(11.28) = -0.1128$$

$$\Delta y = -\eta\left.\frac{\partial f}{\partial y}\right|_{y=2.002} = -(0.01)(-0.24) = 0.0024$$

$x = x + \Delta x = 1.88 - 0.1128 = 1.76$

$y = y + \Delta y = 3.002 + 0.002 = 3.004$