19KU1A0451

Assignment - III

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

Step 1: initialization

$x=1$, $y=1$, epow = 2, $\alpha = 0.2$

iteration = 1!-

$$\frac{\partial f}{\partial x} = 6x = 6$$

$$\frac{\partial f}{\partial y} = -5e^{-y} = -5(0.36) = -1.8$$

$$\Delta x = -\alpha \frac{\partial f}{\partial x} = -(0.2)(6) = -1.2$$

$$\Delta y = -\alpha \frac{\partial f}{\partial x} = +(0.2)(-1.8) = -0.36$$

$x = x + \Delta x = 1 - 1.2 = -0.02$ $\quad x = -0.02$

$y = y + \Delta y = 1 - 0.36 = 0.64$ $\quad y = 0.64$

iteration 2!-

$$\frac{\partial f}{\partial x} = 6x = 6(-0.02) = -0.12$$

$$\frac{\partial f}{\partial y} = -5e^{-0.64} = -2.63$$

$$\Delta x = -\alpha \frac{\partial f}{\partial x} = (-0.2)(-0.12) = 0.024$$

$$\Delta y = -\alpha \frac{\partial f}{\partial y} = -(0.2)(-2.63) = 0.526$$

$x = 0.024$

$y = 0.526$