AI

19KU1A0538

Assignment - 3

Find the global min point and value for the function $f(x,y) = 3x^2 + 5e^{-y} + 10$

A1- Step 1:- Initialization

$x = 1$, $y = 1$, Epochs = 2, $\eta = 0.1$

Iteration 1:-

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

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

$$\Delta x = -\eta \frac{\partial f}{\partial x} = -(0.1)(6) = -0.6$$

$$\Delta y = -\eta \frac{\partial f}{\partial y} = -(0.1)(-1.8) = 0.18$$

$$x = x + \Delta x = 1 - 0.6 = 0.4$$

$$y = y + \Delta y = 1 + 0.18 = 1.18$$

Iteration 2:-

$$\frac{\partial f}{\partial x} = 6x = 2.4$$

$$\frac{\partial f}{\partial y} = -5e^{-y} = -5e^{-1.18} = -1.53$$

$$\Delta x = -\eta \frac{\partial f}{\partial x} = -(0.1)(2.4) = -0.24$$

$$\Delta y = -\eta \frac{\partial f}{\partial y} = -(0.1)(-1.53) = 0.153$$

$$x = x + \Delta x = 0.4 - 0.24 = 0.16$$

$$y = y + \Delta y = 1.18 + 0.153 = 1.33$$