AI assignment - 2 19KU1A0416

Find the global min point & value for the function

$f(x) = x^4 + 3x^2 + 10$

Sol

Step 1: Initialization

$x=1$, epoch = 2, $\eta = 0.1$

Iteration 1:

$\frac{\partial f}{\partial x} = 4x^3 + 6x = 10$

$\Delta x = -\eta \frac{\partial f}{\partial x} = -(0.1)(10) = -1$

$x = x + \Delta x = 1 - 1 = 0$

Iteration 2:

$\frac{\partial f}{\partial x} = 4x^3 + 6x = 0$

$\Delta x = -\eta \frac{\partial f}{\partial x} = -(0.1)(0) = 0$

$x = x + \Delta x = 0 + 0 = 0$

Now, the global min point is $x=0$

min. value of the function is $f(0) = 0 + 0 + 10 = 10$