Assignment-1

18K41A0587

a) find global minimum point and value for

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

Manual calculations for 2 iterations

sol:

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

step 1: $x=1$, $\eta = 0.1$, epochs = 2, itr = 1

step 2: $\frac{\partial f}{\partial x} = 4x^3 + 6x$

$\frac{\partial f}{\partial x}\Big|_{x=1} = 4(1) + 6(1) = 10$

step 3: ~~calc~~ $\Delta x = -\eta \frac{\partial f}{\partial x} = -(0.1)(10) = -1$

step 4: $x = x + \Delta x$

$= 1 + (-1) = 0$

step 5: itr = itr + 1 $= 1 + 1 = 2$

step 6: if (itr > epochs) then goto step 7

else goto step 2

step 2: $\frac{\partial f}{\partial x} = 4x^3 + 6x$

$\frac{\partial f}{\partial x}\Big|_{x=0} = 0$

step 3: $\Delta x = -\eta \frac{\partial f}{\partial x} = -(0.1)(0) = 0$

step 4 : $x = x + \Delta x$

$= 0 + 0$

$= 0.$

step 5 : $itr = itr + 1 = 2 + 1 = 3.$

step 6 : if $(itr > epochs)$ goto step 7

else goto step 2.

step 7 : print variable x

$x = 0.$

$f(x) = 0 + 0 + 10$

$= 10.$