NNDL. 18KU1A05H1

Assignment - 1

Find the global minimum point & value for the function $f(x) = x^4 + 3x^2 + 10$.

Steps:

1) $\eta = -0.001$, $f(x) = x^4 + 3x^2 + 10$, iter $= 0$,

Max. $= 2$., $x = 5$

2) $\frac{\partial f}{\partial x}\Big|_{x=5} = 4x^3 + 6x \Big|_{x=5} = 4(5)^3 + 6(5)$

$= 530$ //

3) $\Delta x = \eta \cdot \frac{\partial f}{\partial x} = -(-0.001)(530)$

$= 0.53$

4) $x = x + \Delta x = 5 + 0.53 = 5.53$

5) iter = iter + 1 = 1

6) if (iter >= Max) $\Rightarrow$ 1 >= 2.

false,

go to Step 2. | $x = 5.53$

2) $\frac{\partial f}{\partial x}\Big|_{x=5.53} = 4(5.53)^3 + 6(5.53)$

$= 709.6$

3) $\Delta x = -\eta \frac{\partial f}{\partial x} = -(-0.001)(709.6)$

$= 0.7096$

4) $x = x + \Delta x = 5.53 + 0.7096 = 6.2396$ //

5) iter = iter + 1.

= 2.

6) if (iter == Max.)

2 >= 2

x = 6.23 → Minimum value point.

16.2-5 → Minimum Value