NNDL Assignment-1

18KU1A04H3

Find the global maximum point and value for the function $f(x) = x^4 + 3x^2 + 10$

→ Manual calculations

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

let $x = 2$; $\eta = 0.01$

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

① →

$\left.\frac{\partial f(x)}{\partial x}\right|_{x=2} = 4(2)^3 + 6(2)$

$= 44$

$\Delta x = -\eta(44)$

$= -0.01(44)$

$= -0.44$

→ $x = x + \Delta x$

$= 2 - 0.44$

$= 1.56$

②

$\left.\frac{\partial f(x)}{\partial x}\right|_{x=1.56} = 4(1.56)^3 + 6(1.56)$

$= 24.545$

$\Delta x = -0.01 \times 24.54$

$= -0.2454$

$x = x + \Delta x$

$= 1.56 - 0.2454$

$= 1.314$