

NNDL
Assignment-1

18K41A0524

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

Sol:

Iteration 1:

→ choose initial vertex $x = 2$ $\eta = 0.01$

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

$$= 4(2)^3 + 6(2)$$

$$= 32 + 12$$

$$= 44$$

→ Step Length

$$\Delta x = -0.01 \times 44$$

$$\boxed{x = x + \Delta x} = -0.44$$

$$x = 2 - 0.44$$

$$x = 1.56$$

Iteration 2:

$$x = 1.56$$

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

$$= 4(1.56)^3 + 6(1.56)$$

$$= 24.545$$

$$\Delta x = -0.01 \times 24.54$$

$$= -0.2454$$

$$\lambda = \lambda + \Delta\lambda$$

$$= 1.56 - 0.245$$

$$= 1.314$$