NNDL ASSIGNMENT

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

$f(x)$ has global minimum at $x = 0$

$$f(0) = (0)^4 + 3(0)^2 + 10$$

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

$$\frac{dy}{dx} = 4x^3 + 6x$$

Initialize $x_0 = 3$

Consider learning rate as 0.01

1st Iteration:-

$$x_1 = x_0 - (\text{learning rate}) * \frac{dy}{dx}$$

$$= 3 - (0.01)(4(3)^3 + 6(3))$$

$$= 3 - 0.01(126)$$

$$= 1.74$$

2nd Iteration:-

$$x_2 = x_1 - (\text{learning rate}) * \frac{dy}{dx}$$

$$= 1.74 - (0.01)(4(1.74)^3 + 6(1.74))$$

$$= 1.74 - (0.01)(31.5120096)$$

$$= 1.424$$