

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

step 1:  $x = 1$ ,  $itr = 1$ ,  $epochs = 2$

$$\text{step 2: } \left. \frac{\partial f}{\partial x} \right|_{x=1} = 4x^3 + 6x \Big|_{x=1} = 4 + 6 = 10$$

$$\text{step 3: } \Delta x = -\eta \times \frac{\partial f}{\partial x} = -0.1 \times 10 = -1$$

$$\text{step 4: } x = x + \Delta x = 1 + (-1) = 0$$

$$\text{step 5: } itr = itr + 1 = 1 + 1 = 2$$

step 6: if ( $itr > epochs$ )

print the value of  $f(x)$ ,  $x$  values  
else:

go to step 2.

step 2:  $x = 0$ ,  $itr = 2$ ,  $epochs = 2$ .

$$\left. \frac{\partial f}{\partial x} \right|_{x=0} = 4x^3 + 6x \Big|_{x=0} = 0$$

$$\text{step 3: } \Delta x = -0.1 \times 0 = 0$$

$$\text{step 4: } x = x + \Delta x = 0$$

$$\text{step 5: } itr = itr + 1 = 2 + 1 = 3$$

step 6:  $3 > 2$ .

the value of  $x = 0$ ,  $f(x) = 10$ .

DONE BY.

B. KRISHNA SAI

19K45A0205