

Nonlinear Assignment - 1

manual calculation

minimum $f(x) = x^2 + 2$

① $\eta = 0.1$, iter max = 2 $x = 5$

② $m = \frac{df}{dx} \Big|_{x=5}$

$$= 2x = 2(5) = 10$$

③ iter = 1!

$$\Delta x = -0.1(10) \Big|$$
$$= \frac{-1}{10} \times 10 = -1$$

④ $\Delta x = -1$
iteration = iter + 1 = 1 + 1 = 2

⑤ $x = 5 - 1 = 4$

⑥ if (2 > 2)
 Σ not satisfied
else

$\eta = 0.1$, $x = 4$
 $m = 2(4) = 8$

$$\Delta x = -0.1(8) = -0.8$$

iter = 2!

$$x = 4 - 0.8 = 3.2$$

$$\text{iter} = 2 + 1 = 3$$

if (3 > 2)
 Σ satisfied

$x = 3.2$ $f(x) = (3.2)^2 + 2 = 10.24 + 2 = 12.24$

$$\begin{array}{r} 32 \\ 32 \\ \hline 64 \\ 96 \\ \hline 192 \end{array}$$

$$\begin{array}{r} 3.2 \\ 3.2 \\ \hline 6.4 \\ 6 \end{array}$$

$$\begin{array}{r} 32 \times 32 \\ 64 \quad 10 \end{array}$$

$$\begin{array}{r} 1024 \\ 1000 \\ \hline 24 \\ 64 \\ 96 \\ \hline 32 \end{array}$$