

Suppose for a given tabular function:

$$\begin{array}{cccccccccc} x & x_1 & x_2 & \cdots & x_{i-1} & x_i & x_{i+1} & \cdots & x_{n-1} & x_n \\ f(x) & f(x_1) & f(x_2) & \cdots & f(x_{i-1}) & f(x_i) & f(x_{i+1}) & \cdots & f(x_{n-1}) & f(x_n) \end{array}$$

Then at given point say x_i , the forward difference operator gives the difference of functional values from the forward value to x_i . While backward difference operator at x_i is difference from backward value from x_i . Mathematically both are given as:

$$\text{Forward difference at } x_i = \Delta(f(x_i)) = f(x_{i+1}) - f(x_i)$$

$$\text{Backward difference at } x_i = \nabla(f(x_i)) = f(x_i) - f(x_{i-1})$$