

Interpolasi Newton Gregory Maju

Metode Newton  
 $\Delta$  - menyatakan selisih maju

$s = \frac{x-x_0}{h}$  dan  $h = x_{i+1} - x_i$

Jika 2 titik maka  $f(x) \approx P_1(x) = f(x_0) + \Delta f(x_0) \cdot s$

(0, -6) (2, 4) (4, 10)

$f(1) = \dots ?$

x	f(x)	$\Delta f(x)$	$\Delta^2 f(x)$
0	-6		
		10	
2	4		-4
		6	
4	10		

$\rightarrow f(x_0)$   
 $\rightarrow f(x_1)$   
 $\rightarrow f(x_2)$

$h = 2$   
 $s = \frac{x-0}{2} = \frac{x}{2}$

$h = 2 - 0$   
 $h = x - 0$   
 $s = \frac{x-0}{2}$

$P_2(x) = f(x_0) + \Delta f(x_0) \cdot s + \frac{\Delta^2 f(x_0)}{2!} \cdot s(s-1)$

$= -6 + 10 \cdot \left(\frac{x}{2}\right) + \frac{(-4) \cdot \left(\frac{x}{2}\right) \left(\frac{x}{2} - 1\right)}{2}$

$= -6 + 5x + (-2) \left(\frac{x}{2}\right) \left(\frac{x}{2} - 1\right)$

$f(x) \approx P_2(x) = -6 + 5x + (-2) \left(\frac{x}{2}\right) \left(\frac{x}{2} - 1\right)$

~~$f(x) \approx P_2(x)$~~

$f(1) \approx -6 + 5x + (-2) \left(\frac{x}{2}\right) \left(\frac{x}{2} - 1\right)$

$\approx -6 + 5(1) + (-2) \left(\frac{1}{2}\right) \left(\frac{1}{2} - 1\right)$

$\approx -6 + 5 + (-2) \left(\frac{1}{2}\right) \left(-\frac{1}{2}\right)$

$\approx -6 + 5 + \frac{1}{2}$

$\approx -1 + \frac{1}{2}$

$\approx -\frac{2}{2} + \frac{1}{2} \approx -\frac{1}{2} \approx -0.5$

Mundur

$$f(x) \approx P_n(x) = f(x_n) + \nabla f(x_n) \cdot s + \frac{\nabla^2 f(x_n)}{2!} \cdot s(s-1)$$

$$\text{dan } s = \frac{x - x_n}{h} \quad \text{dan } h = x_{i+1} - x_i$$

$$f(1) \approx \dots$$

$$\text{titik } (0, -6) : (2, 4) (4, 10)$$

x	f(x)	$\nabla f(x)$	$\nabla^2 f(x)$
0	-6		
		10	
2	4		-4
		6	
4	10		

$$\rightarrow \nabla^2 f(x_2)$$

$$\rightarrow \nabla f(x_2)$$

$$\rightarrow f(x_2)$$

$$h = 2$$

$$s = \frac{x-4}{2}$$

$$P_2(x) = f(x_2) + \nabla f(x_2) \cdot s + \frac{\nabla^2 f(x_2)}{2!} \cdot s(s+1)$$

$$= 10 + 6 \cdot \left(\frac{x-4}{2}\right) + \frac{(-4)}{2} \left(\frac{x-4}{2}\right) \left(\frac{x-4}{2} + 1\right)$$

$$f(x) \approx P_2(x) = 10 + 3(x-4) + (-2) \left(\frac{x-4}{2}\right) \left(\frac{x-4}{2} + 1\right)$$

$$f(1) \approx 10 + 3(1-4) + (-2) \left(\frac{1-4}{2}\right) \left(\frac{1-4}{2} + 1\right)$$

$$\approx 10 + 3(-3) + (-2) \left(\frac{-3}{2}\right) \left(\frac{-3}{2} + 1\right)$$

$$\approx 10 + (-9) + (-2) \left(\frac{-3}{2}\right) \left(\frac{-3}{2} + 1\right)$$

$$\approx 10 - 9 + 3 \left(\frac{-3}{2} + \frac{3}{2}\right)$$

$$\approx 10 - 9 + 3 \left(\frac{-1}{2}\right)$$

$$\approx 10 - 9 + \left(\frac{-3}{2}\right)$$

$$\approx 1 + \left(\frac{-3}{2}\right)$$

$$\approx \frac{2}{2} + \left(\frac{-3}{2}\right)$$

$$\approx \frac{-1}{2} \approx -0.5$$

apakah benar  
& mundur  
hasilnya akan  
sama