Bab 14

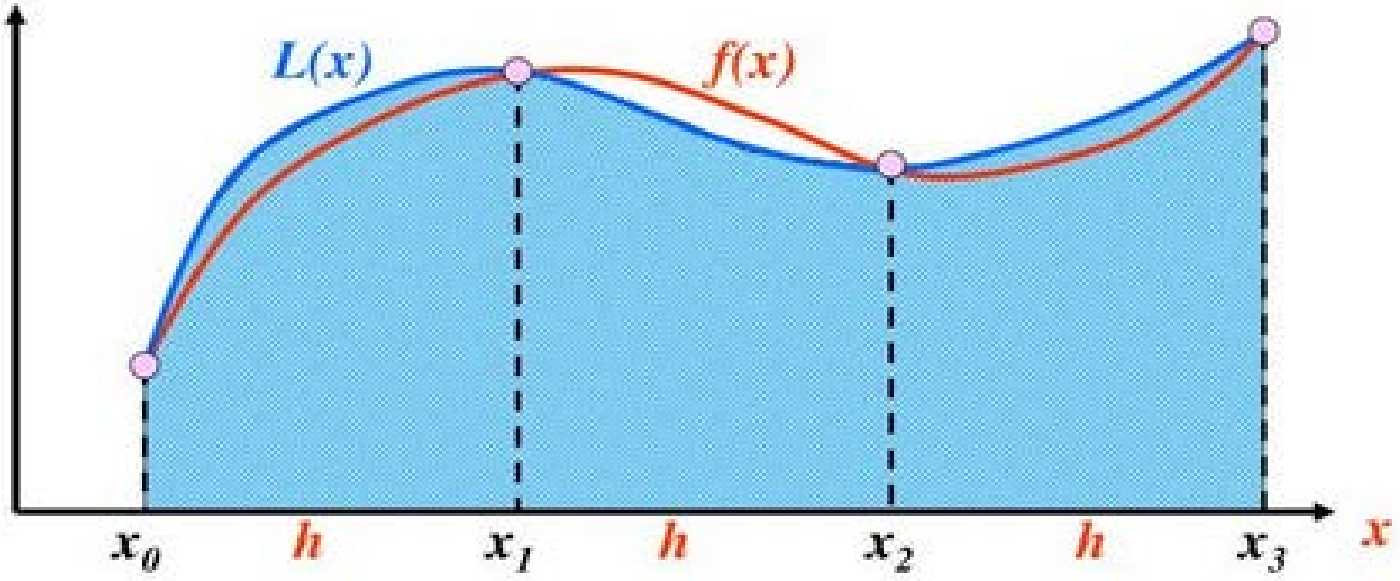
Metode Simpson 3/8

Aturan Simpson 3/8

Aproksimasi dengan fungsi kubik

$$\int_a^b f(x)dx \approx \sum_{i=0}^{3} c_i f(x_i) = c_0 f(x_0) + c_1 f(x_1) + c_2 f(x_2) + c_3 f(x_3)$$

$$= \frac{3h}{8}\left[f(x_0) + 3f(x_1) + 3f(x_2) + f(x_3)\right]$$



Aturan Simpson 3/8

$$L(x)=\frac{(x-x_1)(x-x_2)(x-x_3)}{(x_0-x_1)(x_0-x_2)(x_0-x_3)}f(x_0)+\frac{(x-x_0)(x-x_2)(x-x_3)}{(x_1-x_0)(x_1-x_2)(x_1-x_3)}f(x_1)$$
$$+\frac{(x-x_0)(x-x_1)(x-x_3)}{(x_2-x_0)(x_2-x_1)(x_2-x_3)}f(x_2)+\frac{(x-x_0)(x-x_1)(x-x_2)}{(x_3-x_0)(x_3-x_1)(x_3-x_2)}f(x_3)$$

$$\int_a^b f(x)dx \approx \int_a^b L(x)dx \;;\quad h=\frac{b-a}{3}$$
$$=\frac{3h}{8}\left[f(x_0)+3f(x_1)+3f(x_2)+f(x_3)\right]$$

- **Error Pemenggalan**

$$E_t=-\frac{3}{80}h^5 f^{(4)}(\xi)=-\frac{(b-a)^5}{6480}f^{(4)}(\xi);\; h=\frac{b-a}{3}$$

Soal : Motode Simpson 3/8

Diketahui

$$f(x) = 2x^2 + 4x + 6 \text{ dan } \int_1^7 f(x)dx$$

Hitunglah nilai dari $\boldsymbol{I}$ (luas daerah di bawah kurva) menggunakan: (1) cara analitik dan (2) cara numeric menggunakan metode simpson 3/8 , kemudian bandingkan hasilnya!

Tugas

- Silahkan mengerjakan soal hal 4
- Dikumpulkan max besok jumat 24/12/21 pukul 14.00 wib
- Dg judul MetnumTi3p14-NIM