Lab 8

S-megközelítés, lépés optimalizálás
- aranymetszet
- interpoláció

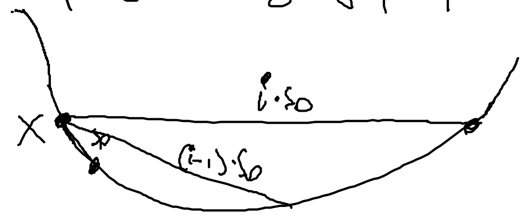
A főprogram meghívja – S-re

① Aranymetszés

Hgy. alg. 2 rész
(közös (itt nyers) → intervallum keresés meghatározás

• Intervallum [a, b] – keresés
  - a – mi lépten túl
  - b – túllépve

Sopt = golden(f, g, x, s0) ← lépést kereső lépés



Milyen feltételt van

$f(x-(i-1)\,s_0 g) < f(x - i s_0 g)$

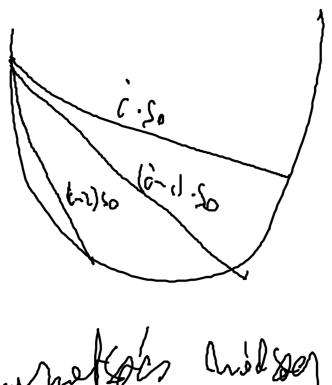
$b = i \cdot s_0$

WHILE
i=1 → i++
teljesül!
(meg kell fordítani)

Ha i ≥ 3 ; i < 3

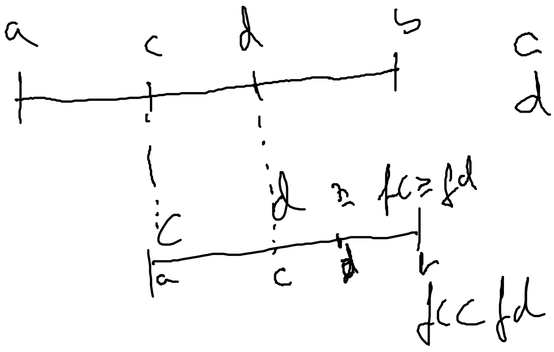
$i \geq 3 \quad a = (i-2) s_0$

$i < 3 \quad a = (i-1) \cdot s_0$



II. Aranymetszés módszer

Arany [a, b] → $w = \frac{3-\sqrt{5}}{2}$; $\frac{w}{1-w} = \frac{1-w}{1}$



$c = a + w(b-a)$

$d = a + (1-w)(b-a)$

$d = c + (1-w)(b-c)$

$fc = f(x - c \cdot g)$

$fd = f(x - d \cdot g)$

$|a-b| \leq \varepsilon$
→ kilép feltétel

Interpoláció

$$P(s) = a_3 s^3 + a_2 s^2 + a_1 s + a_0 \rightarrow S_{opt}$$

↳ eşzamanlı

$$e_1 = f(x - S_L \cdot g_1) = a_3 \cdot S_L^3 + a_2 \cdot S_L^2 + a_1 \cdot S_L + a_0$$

$$e_2 = f(x - S_H \cdot g_1) = a_3 \cdot S_H^3 + a_2 S_H^2 + a_1 S_H + a_0$$

$$e_3 = \frac{\partial f}{\partial S_L} \approx \frac{f(x-(S_L+h)\cdot g_1) - f(x - S_L \cdot g_1)}{h}$$

$$e_4 = \frac{\partial f}{\partial S_H} = \frac{f(x-(S_H+h)g_1) - f(x - S_H g_1)}{h}$$

$$= 3a_3 \cdot S_H^2 + 2a_2 S_H + a_1$$

$$E = \begin{bmatrix} e_1 \\ e_2 \\ e_3 \\ e_4 \end{bmatrix}, \quad M = \begin{bmatrix} S_L^3 & S_L^2 & S_L & 1 \\ S_H^3 & S_H^2 & S_H & 1 \\ 3S_L^2 & 2S_L & 1 & 0 \\ 3S_H^2 & 2S_H & 1 & 0 \end{bmatrix} \quad A = \begin{pmatrix} a_3 \\ a_2 \\ a_1 \\ a_0 \end{pmatrix}$$

roots([3a_3 2a_2 a_1])

$$E = M \cdot A$$

$$3a_3 s^2 + 2a_2 s + a_1 = 0$$

$$A = inv(M) \cdot E$$

$$f(x - s \cdot g_2) < f(x - S_L \, g_1) \Rightarrow \begin{array}{l} S_{opt} = s_1 \\ S_{opt} = s_2 \end{array}$$