

Diferentzia zatituak: memorian biltegiraketa

Zenbakizko Analisia I

Euskal Herriko Unibertsitatea.

Diferentzia zatituak

$$\begin{aligned}
 P(x) &= f[x_0] + f[x_0, x_1](x - x_0) \\
 &\quad + f[x_0, x_1, x_2](x - x_0)(x - x_1) \\
 &\quad + f[x_0, x_1, x_2, x_3](x - x_0)(x - x_1)(x - x_2) \\
 &\quad + \dots \\
 &\quad + f[x_0, x_1, \dots, x_n](x - x_0) \dots (x - x_{n-1})
 \end{aligned}$$

polinomioa ebaluatzeko era optimoa Hörner-en teknikaren ondorengo bariazioa da:

$$\begin{aligned}
 P(x) &= [\dots [[a_n(x - x_{n-1}) + a_{n-1}](x - x_{n-2}) + a_{n-2}] \dots + a_1](x - x_0) + a_0
 \end{aligned}$$

Sarrera (hasierako datuak)

$$\begin{pmatrix} x_0 \\ x_1 \\ \vdots \\ x_{n-1} \\ x_n \end{pmatrix} \quad \text{eta} \quad \begin{pmatrix} f(x_0) \\ f(x_1) \\ \vdots \\ f(x_{n-1}) \\ f(x_n) \end{pmatrix}$$

finkarutik

$$\begin{pmatrix} x_0 \\ x_1 \\ \vdots \\ x_{n-1} \\ x_n \end{pmatrix} \quad \text{eta} \quad \begin{pmatrix} f(x_0) \\ f(x_1) \\ \vdots \\ f(x_{n-1}) \\ f(x_n) \end{pmatrix}$$

aldatuko da (pausuz pausu...)

$$\begin{pmatrix} x_0 \\ x_1 \\ \vdots \\ x_{n-1} \\ x_n \end{pmatrix}$$

eta

$$\begin{pmatrix} f[x_0] \\ f[x_1] \\ \vdots \\ f[x_{n-1}] \\ f[x_n] \end{pmatrix}$$

$$f[x_n, x_{n-1}]$$

$$\begin{pmatrix} x_0 \\ x_1 \\ \vdots \\ x_{n-1} \\ x_n \end{pmatrix} \quad \text{eta} \quad \begin{pmatrix} f[x_0] \\ f[x_1] \\ \vdots \\ f[x_{n-1}] \\ f[x_n] \end{pmatrix}$$

$$f[x_n, x_{n-1}]$$

$$\begin{pmatrix} x_0 \\ x_1 \\ \vdots \\ x_{n-1} \\ x_n \end{pmatrix} \quad \text{eta} \quad \begin{pmatrix} f[x_0] \\ f[x_1] \\ \vdots \\ f[x_{n-1}] \\ f[x_n] \end{pmatrix}$$

$$f[x_n, x_{n-1}]$$

$$\begin{pmatrix} x_0 \\ x_1 \\ \vdots \\ x_{n-1} \\ x_n \end{pmatrix} \quad \text{eta} \quad \begin{pmatrix} f[x_0] \\ f[x_1] \\ \vdots \\ f[x_{n-1}] \\ f[x_n] \end{pmatrix}$$

ordezkatuta!

$$\begin{pmatrix} x_0 \\ x_1 \\ \vdots \\ x_{n-1} \\ x_n \end{pmatrix} \quad \text{eta} \quad \begin{pmatrix} f[x_0] \\ f[x_1] \\ \vdots \\ f[x_{n-1}] \\ f[x_n, x_{n-1}] \end{pmatrix}$$

$$f[x_{n-1}, x_{n-2}]$$

$$\begin{pmatrix} x_0 \\ x_1 \\ \vdots \\ x_{n-2} \\ x_{n-1} \\ x_n \end{pmatrix} \quad \text{eta} \quad \begin{pmatrix} f[x_0] \\ f[x_1] \\ \vdots \\ f[x_{n-2}] \\ f[x_{n-1}] \\ f[x_n, x_{n-1}] \end{pmatrix}$$

$$f[x_{n-1}, x_{n-2}]$$

$$\begin{pmatrix} x_0 \\ x_1 \\ \vdots \\ x_{n-2} \\ x_{n-1} \\ x_n \end{pmatrix} \quad \text{eta} \quad \begin{pmatrix} f[x_0] \\ f[x_1] \\ \vdots \\ f[x_{n-2}] \\ f[x_{n-1}] \\ f[x_n, x_{n-1}] \end{pmatrix}$$

$$f[x_{n-1}, x_{n-2}]$$

$$\begin{pmatrix} x_0 \\ x_1 \\ \vdots \\ x_{n-2} \\ x_{n-1} \\ x_n \end{pmatrix} \quad \text{eta} \quad \begin{pmatrix} f[x_0] \\ f[x_1] \\ \vdots \\ f[x_{n-2}] \\ f[x_{n-1}] \\ f[x_n, x_{n-1}] \end{pmatrix}$$

Ordezkatuta!

$$\begin{pmatrix} x_0 \\ x_1 \\ \vdots \\ x_{n-2} \\ x_{n-1} \\ x_n \end{pmatrix} \quad \text{eta} \quad \begin{pmatrix} f[x_0] \\ f[x_1] \\ \vdots \\ f[x_{n-2}] \\ f[x_{n-1}, x_{n-2}] \\ f[x_n, x_{n-1}] \end{pmatrix}$$

Jarraitu gorantz...

$$\begin{pmatrix} x_0 \\ x_1 \\ \vdots \\ x_{n-2} \\ x_{n-1} \\ x_n \end{pmatrix} \quad \text{eta} \quad \begin{pmatrix} f[x_0] \\ f[x_1] \\ \vdots \\ f[x_{n-2}] \\ f[x_{n-1}, x_{n-2}] \\ f[x_n, x_{n-1}] \end{pmatrix}$$

Jarraitu gorantz...

$$\begin{pmatrix} x_0 \\ x_1 \\ \vdots \\ x_{n-2} \\ x_{n-1} \\ x_n \end{pmatrix} \quad \text{eta} \quad \begin{pmatrix} f[x_0] \\ f[x_1] \\ \vdots \\ f[x_{n-2}, x_{n-3}] \\ f[x_{n-1}, x_{n-2}] \\ f[x_n, x_{n-1}] \end{pmatrix}$$

azkenean, 1. ordenako diferentzia guztiak!

$$\begin{pmatrix} x_0 \\ x_1 \\ \vdots \\ x_{n-2} \\ x_{n-1} \\ x_n \end{pmatrix} \quad \text{eta} \quad \begin{pmatrix} f[x_0] \\ f[x_0, x_1] \\ \vdots \\ f[x_{n-2}, x_{n-3}] \\ f[x_{n-1}, x_{n-2}] \\ f[x_n, x_{n-1}] \end{pmatrix}$$

Hurrengo ordenakoak: $f[x_n, x_{n-1}, x_{n-2}]$

$$\begin{pmatrix} x_0 \\ x_1 \\ \vdots \\ x_{n-2} \\ x_{n-1} \\ x_n \end{pmatrix} \quad \text{eta} \quad \begin{pmatrix} f[x_0] \\ f[x_0, x_1] \\ \vdots \\ f[x_{n-2}, x_{n-3}] \\ f[x_{n-1}, x_{n-2}] \\ f[x_n, x_{n-1}] \end{pmatrix}$$

Eta jarraitzen dugu gorantz

$$\begin{pmatrix} x_0 \\ x_1 \\ \vdots \\ x_{n-2} \\ x_{n-1} \\ x_n \end{pmatrix} \quad \text{eta} \quad \begin{pmatrix} f[x_0] \\ f[x_0, x_1] \\ \vdots \\ f[x_{n-2}, x_{n-3}] \\ f[x_{n-1}, x_{n-2}] \\ f[x_n, x_{n-1}, x_{n-2}] \end{pmatrix}$$

Eta jarraitzen dugu gorantz

$$\begin{pmatrix} x_0 \\ x_1 \\ \vdots \\ x_{n-2} \\ x_{n-1} \\ x_n \end{pmatrix} \quad \text{eta} \quad \begin{pmatrix} f[x_0] \\ f[x_0, x_1] \\ \vdots \\ f[x_{n-2}, x_{n-3}] \\ f[x_{n-1}, x_{n-2}, x_{n-3}] \\ f[x_n, x_{n-1}, x_{n-2}] \end{pmatrix}$$

2. ordenako diferentzia zatitu guztiak!

$$\begin{pmatrix} x_0 \\ x_1 \\ x_2 \\ \vdots \\ x_{n-1} \\ x_n \end{pmatrix} \quad \text{eta} \quad \begin{pmatrix} f[x_0] \\ f[x_0, x_1] \\ f[x_0, x_1, x_2] \\ \vdots \\ f[x_{n-1}, x_{n-2}, x_{n-3}] \\ f[x_n, x_{n-1}, x_{n-2}] \end{pmatrix}$$

Bukaeran... Irteera!

$$\begin{pmatrix} x_0 \\ x_1 \\ x_2 \\ \vdots \\ x_{n-1} \\ x_n \end{pmatrix} \quad \text{eta} \quad \begin{pmatrix} f[x_0] \\ f[x_0, x_1] \\ f[x_0, x_1, x_2] \\ \vdots \\ f[x_0, x_1, \dots, x_{n-1}] \\ f[x_0, x_1, \dots, x_{n-1}, x_n] \end{pmatrix}$$

Fitxategia deskarga dezakezu hemen:

<http://www.ehu.es/joseroyo>