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Notations

$\{x, y, z, \ldots\}$ = The set consisting of the elements x,y,z.

R=the set of real numbers

= equal

Σ Summation

$[a, b] = \{x \in R : a \le x \le b\}$ a closed Int.

$(a, b) = \{x \in R : a < x < b\}$, an open inter.

li = a Language's polynomial .

τ, (τ_i), $(\tau_i)^n$

$(\tau_i)^n{}_{i-1}$ or $[\tau_1, \tau_2$ -------- τ_n are various ways of describing the same n-vector

$\Delta \tau_i = \tau_{i+1} - \tau_i$ The forward difference

$\nabla \tau_i = \tau_i - \tau_{i-1}$ The backward difference

$$\prod_{i=r}^{s} \tau_i = \tau_r \, \tau_{r+1} \cdots \tau_s \quad \text{if} \quad r \le s$$

$$= 1 \qquad r > s$$

$\delta_{ij} = 1 \quad i = j$ the Kronecker delta

$\quad = 0 \quad i \neq j$

$C[a, b] = \{ f : [a, b] \to R : f$ Continuous $\}$

$C^{[n]}[a, b] = \{ f : [a, b] \to R :$ f is n times continuously differentiable

$[\tau_i \ \ldots \ \tau_j] f$: divided difference of order

$j - i$ of 'f' at the pts $\tau i \ldots\ldots \tau j$

\$2 = linear space of all continuous broken line $[\tau_1 \ \ldots \ \tau_2]$ i..e. (splines of order 2)

$\|f\| = \max\{|f(x)| : a \le x \le b\}$, the uniform norm of $f \in C[a, b]$

$[\| f + g \| \le \|f\| + \|g\| \quad , \quad \|\propto f\| = |\propto| \ \|f\|$

For $f, g \in C[a, b]$ and $\propto \in R$

L_k = Least – squares approximation by splines or order K .

P_n = set of q all polynomials of degree at most n.

$(x)_+=\max\{x,0\}$,the truncation function.

Supp $f=\{x \in \text{dom } f: f(x) \neq 0\}$, the suopport of f.