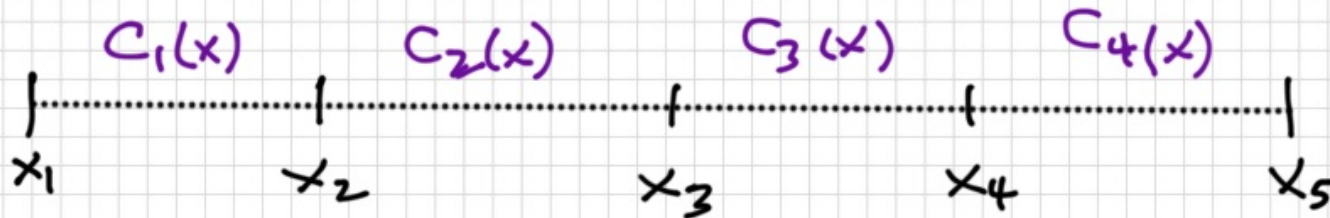


splines

$(x_1, y_1) s_1$ $(x_2, y_2) s_2$ $(x_3, y_3) s_3$ $(x_4, y_4) s_4$
 $(x_2, y_2) s_2$ $(x_3, y_3) s_3$ $(x_4, y_4) s_4$ $(x_5, y_5) s_5$



① $s_1 = \alpha$ ← clamped spline $\in \mathbb{P}_N$

② $\Delta x_2 s_1 + 2(\Delta x_2 + \Delta x_1) s_2 + \Delta x_1 s_3 = 3(\Delta x_2 y[x_1, x_2] + \Delta x_1 y[x_2, x_3])$

③ $\Delta x_3 s_2 + 2(\Delta x_3 + \Delta x_2) s_3 + \Delta x_2 s_4 = 3(\Delta x_3 y[x_2, x_3] + \Delta x_2 y[x_3, x_4])$

④ $\Delta x_4 s_3 + 2(\Delta x_4 + \Delta x_3) s_4 + \Delta x_3 s_5 = 3(\Delta x_4 y[x_3, x_4] + \Delta x_3 y[x_4, x_5])$

⑤ $s_5 = \beta$

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express in Matrix form



$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ \Delta x_2 & 2(\Delta x_2 + \Delta x_1) & \Delta x_1 & 0 & 0 \\ 0 & \Delta x_3 & 2(\Delta x_3 + \Delta x_2) & \Delta x_2 & 0 \\ 0 & 0 & \Delta x_4 & 2(\Delta x_4 + \Delta x_3) & \Delta x_3 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} s_1 \\ s_2 \\ s_3 \\ s_4 \\ s_5 \end{pmatrix}$$

$$= \begin{pmatrix} \alpha \\ 3\Delta x_2 y[x_1, x_2] + 3\Delta x_1 y[x_2, x_3] \\ 3\Delta x_3 y[x_2, x_3] + 3\Delta x_2 y[x_3, x_4] \\ 3\Delta x_4 y[x_3, x_4] + 3\Delta x_3 y[x_4, x_5] \\ \beta \end{pmatrix}$$

solve
to define
splines



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