Raffaluca
Valmir Sinani
2HC1

Aufg. 1

x_i	0	1	2	3
y_i	2	1	2	2

i	0	1	2	3
x_i	0	1	2	3
y_i	2	1	2	2
g_i	1	1	1	2
h_i	1	1	1	1
c_i	0	?	?	0

$$i=1 = 2(h_0+h_1)c_1 + h_1 c_2 = 3\frac{y_2-y_1}{h_1} - 3\frac{y_1-y_0}{h_0}$$

$$i=2 \Rightarrow h_1 c_1 + 2(h_1+h_2)c_2 = 3\frac{y_3-y_2}{h_2} - 3\frac{y_2-y_1}{h_1}$$

$$\Leftrightarrow \begin{pmatrix} 2(h_0+h_1) & h_1 \\ h_1 & 2(h_1+h_2) \end{pmatrix}\begin{pmatrix} c_1 \\ c_2 \end{pmatrix} = 3\begin{pmatrix} \frac{y_2-y_1}{h_1} - \frac{y_1-y_0}{h_0} \\ \frac{y_3-y_2}{h_2} - \frac{y_2-y_1}{h_1} \end{pmatrix}$$

$$\Leftrightarrow \begin{pmatrix} 4 & 1 \\ 1 & 4 \end{pmatrix}\begin{pmatrix} c_1 \\ c_2 \end{pmatrix} = \begin{pmatrix} 6 \\ -3 \end{pmatrix}$$

$$\Rightarrow \begin{pmatrix} c_1 \\ c_2 \end{pmatrix} = \begin{pmatrix} 1.8 \\ -1.2 \end{pmatrix}$$

$i=0$

$$b_0 = \frac{y_1-y_0}{h_0} - \frac{h_0}{3}(c_1+2c_0) = \frac{1-2}{1} - 1/3(1.8+(2\cdot 0)) = -1 - 1/3(1.8) = -1.6$$

$i=1$

$$b_1 = \frac{y_2-y_1}{h_1} - \frac{h_1}{3}(c_2+2c_1) = \frac{2-1}{1} - 1/3(-1.2+(2\cdot 1.8)) = 1 - 1/3(3.4) = 0.2$$

$i=2$

$$b_2 = \frac{y_3-y_2}{h_2} - \frac{h_2}{3}(c_3+2c_2) = \frac{2-2}{1} - 1/3(0+(2\cdot -1.2)) = 0 - 1/3(-2.4) = 0.8$$

$$d_0 = \frac{1}{3h_0}(c_1-c_0) = 1/3(1.8-0) = 0.6$$

$$d_1 = \frac{1}{3h_1}(c_2-c_1) = 1/3(-1.2-1.8) = -1$$

$$d_2 = \frac{1}{3h_2}(c_3-c_2) = 1/3(0+1.2) = 0.4$$