HM 2 – Serie 5

Aufgabe 1

i	0	1	2	3
x_i	4	6	8	10
y_i	6	3	9	0
a_i	6	3	9	*
h_i	2	2	2	*
c_i	0	2.55	-3.45	0

$$A = \begin{pmatrix} 2\cdot(2+2) & 2 \\ 2 & 2\cdot(2+2) \end{pmatrix} = \begin{pmatrix} 8 & 2 \\ 2 & 8 \end{pmatrix}$$

$$z = \begin{pmatrix} 3\cdot\frac{9-3}{2} - 3\cdot\frac{3-6}{2} \\ 3\cdot\frac{0-9}{2} - 3\cdot\frac{9-3}{2} \end{pmatrix} = \begin{pmatrix} 9 - -4.5 \\ -13.5 - 9 \end{pmatrix} = \begin{pmatrix} 13.5 \\ -22.5 \end{pmatrix}$$

$$A\cdot\vec{c} = \vec{z} \Rightarrow \left(\begin{array}{cc|c} 8 & 2 & 13.5 \\ 2 & 8 & -22.5 \end{array}\right) = \vec{c} = \begin{pmatrix} 2.55 \\ -3.45 \end{pmatrix}$$

$$\vec{b} = \begin{pmatrix} \frac{3-6}{2} - \frac{2}{3}(2.55 + 2\cdot 0) \\ \frac{9-3}{2} - \frac{2}{3}(-3.45 + 2\cdot 2.55) \\ \frac{0-9}{2} - \frac{2}{3}(0 + 2\cdot -3.45) \end{pmatrix} = \begin{pmatrix} -3.2 \\ 1.9 \\ 0.1 \end{pmatrix}$$

$$\vec{d} = \ldots = \begin{pmatrix} 0.425 \\ -1 \\ 0.575 \end{pmatrix}$$

$$S_0(x) = 6 - 3.2x + 0.425x^3$$

$$S_1(x) = 3 + 1.9x + 2.55x^2 - 1x^3$$

$$S_3(x) = 9 + 0.1x - 3.45x^2 + 0.575x^3$$