

(1)

i	n <sub>i</sub>
0	0
1	2
2	5
3	7
4	5
5	3
6	3
7	0

$$\begin{aligned} s_0 &= 7 \cdot 0 = 0 \\ s_1 &= 7 \cdot \frac{2}{25} = 0.56 \approx 0 \\ s_2 &= 7 \cdot \frac{5}{25} = 1.96 \approx 2 \\ s_3 &= 7 \cdot \frac{7}{25} = 3.92 \approx 4 \\ s_4 &= 7 \cdot \frac{5}{25} = 3.92 \approx 5 \\ s_5 &= 7 \cdot \frac{3}{25} = 6.16 \approx 6 \\ s_6 &= 7 \cdot 1 = 7 \\ s_7 &= 7 \cdot 1 = 7 \end{aligned}$$

2	6	5	7	4
4	7	4	2	5
5	4	6	5	7
4	2	2	5	6
2	0	4	4	0

(2)  $z = g^{-1}(s)$

i	n <sub>i</sub>
0	2
1	3
2	4
3	4
4	3
5	4
6	3
7	2

$$\begin{aligned} s_0 &= 7 \cdot \frac{2}{25} = 0.56 \approx 0 \\ s_1 &= 7 \cdot \frac{5}{25} = 1.4 \approx 1 \\ s_2 &= 7 \cdot \frac{4}{25} = 2.52 \approx 2 \\ s_3 &= 7 \cdot \frac{4}{25} = 3.64 \approx 4 \\ s_4 &= 7 \cdot \frac{3}{25} = 4.48 \approx 4 \\ s_5 &= 7 \cdot \frac{4}{25} = 5.6 \approx 6 \\ s_6 &= 7 \cdot \frac{3}{25} = 6.44 \approx 6 \\ s_7 &= 7 \cdot 1 = 7 \end{aligned}$$

2	5	4	7	3
3	7	3	2	4
4	3	5	4	7
3	2	2	4	5
2	0	3	3	0

$$\rightarrow 2^3 - 1$$

(3)  $g = f - \nabla^2 f = 5 - (3+2+3+4-20) = 13 > 7 \Rightarrow g = 7$

(4)  $g = f + k \cdot h = 5 + 2 \cdot (5 - \frac{86}{25}) = 5 + 2 \cdot 1.56 = 8.12 > 7 \Rightarrow g = 7$

(5)

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 2 & 5 & 4 & 6 & 3 & 0 \\ 0 & 3 & 6 & 3 & 2 & 4 & 0 \\ 0 & 4 & 3 & 5 & 4 & 6 & 0 \\ 0 & 3 & 2 & 2 & 4 & 5 & 0 \\ 0 & 2 & 1 & 3 & 3 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix} \times \begin{bmatrix} 0.1 & 0.0 & 0.2 \\ 0.2 & 0.1 & 0.1 \\ 0.0 & 0.2 & 0.1 \end{bmatrix} = \begin{bmatrix} 1.9 & 2.8 & 2.8 & 2.5 & 2.3 \\ 3.0 & 3.6 & 4.8 & 3.6 & 2.6 \\ 2.7 & 3.1 & 3.3 & 4.0 & 2.6 \\ 1.6 & 2.9 & 3.0 & 3.7 & 1.9 \\ 0.7 & 1.5 & 1.8 & 2.2 & 1.1 \end{bmatrix}$$

(6)

$$\begin{bmatrix}
 0 & 0 & 0 & 0 & 0 & 0 \\
 0 & 2 & 5 & 4 & 6 & 3 & 0 \\
 0 & 3 & 6 & 3 & 2 & 4 & 0 \\
 0 & 4 & 3 & 5 & 4 & 6 & 0 \\
 0 & 3 & 2 & 2 & 4 & 5 & 0 \\
 0 & 2 & 1 & 3 & 3 & 1 & 0 \\
 0 & 0 & 0 & 0 & 0 & 0 & 0
 \end{bmatrix}
 \times
 \begin{bmatrix}
 0.1 & 0.2 & 0.0 \\
 0.1 & 0.1 & 0.2 \\
 0.2 & 0.0 & 0.1
 \end{bmatrix}
 =
 \begin{bmatrix}
 1.8 & 2.4 & 3.5 & 2.6 & 1.3 \\
 2.2 & 4.0 & 3.6 & 4.5 & 2.6 \\
 1.8 & 4.0 & 3.6 & 3.9 & 2.8 \\
 1.6 & 2.6 & 3.0 & 3.6 & 3.1 \\
 1.0 & 1.6 & 1.6 & 1.8 & 1.8
 \end{bmatrix}$$

(7)

$$f(3.5, 3.5) = 0.5 \cdot 0.5 \cdot 4 + 0.5 \cdot 0.5 \cdot 5 + 0.5 \cdot 0.5 \cdot 3 + 0.5 \cdot 0.5 \cdot 1 = 3.25$$