

Übungsblatt 3

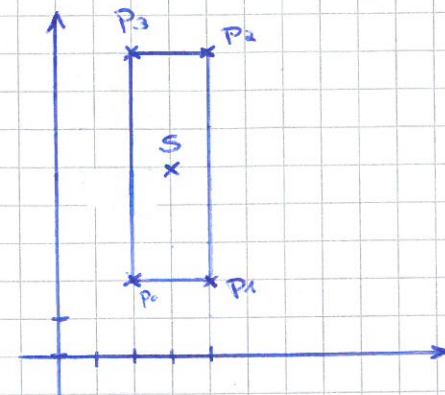
~~sin~~ sind signed distance field
sight

Aufgabe 1

$$a) \vec{p}_0 = \begin{bmatrix} 2 \\ 2 \end{bmatrix} \quad \vec{p}_1 = \begin{bmatrix} 4 \\ 2 \end{bmatrix} \quad \vec{p}_2 = \begin{bmatrix} 4 \\ 8 \end{bmatrix} \quad \vec{p}_3 = \begin{bmatrix} 2 \\ 8 \end{bmatrix}$$

4 magin square
qu

$$\vec{s} = \begin{bmatrix} 3 \\ 5 \end{bmatrix}$$



1) Schwerpunkt in Ursprung verschieben

$$\Rightarrow \vec{p}_0 = \begin{bmatrix} 2-3 \\ 2-5 \end{bmatrix} = \begin{bmatrix} -1 \\ -3 \end{bmatrix} \quad \vec{p}_1 = \begin{bmatrix} 1 \\ -3 \end{bmatrix} \quad \vec{p}_2 = \begin{bmatrix} 1 \\ 3 \end{bmatrix} \quad \vec{p}_3 = \begin{bmatrix} -1 \\ 3 \end{bmatrix}$$

2) Rotieren um 45°

$$\vec{q}_0 = \begin{bmatrix} \cos 45 & -\sin 45 \\ \sin 45 & \cos 45 \end{bmatrix} \cdot \begin{bmatrix} -1 \\ -3 \end{bmatrix} = \begin{bmatrix} -\frac{\sqrt{2}}{2} + 3 \cdot \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} - 3 \cdot \frac{\sqrt{2}}{2} \end{bmatrix} = \begin{bmatrix} \sqrt{2} \\ -2\sqrt{2} \end{bmatrix}$$

$$\vec{q}_1 = \begin{bmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{bmatrix} \cdot \begin{bmatrix} 1 \\ -3 \end{bmatrix} = \begin{bmatrix} 2\sqrt{2} \\ -\sqrt{2} \end{bmatrix}$$

$$\vec{q}_2 = \begin{bmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{bmatrix} \cdot \begin{bmatrix} 1 \\ 3 \end{bmatrix} = \begin{bmatrix} -\sqrt{2} \\ -\sqrt{2} \end{bmatrix}$$

$$\vec{q}_3 = \begin{bmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{bmatrix} \cdot \begin{bmatrix} -1 \\ 3 \end{bmatrix} = \begin{bmatrix} -2\sqrt{2} \\ \sqrt{2} \end{bmatrix}$$

3) Zurück verschieben

$$\vec{q}_0 = \begin{bmatrix} \sqrt{2}+3 \\ 5-2\sqrt{2} \end{bmatrix} \quad \vec{q}_1 = \begin{bmatrix} 2\sqrt{2}+3 \\ 5-\sqrt{2} \end{bmatrix} \quad \vec{q}_2 = \begin{bmatrix} 3-\sqrt{2} \\ 5-\sqrt{2} \end{bmatrix}$$

$$\vec{q}_3 = \begin{bmatrix} 3-2\sqrt{2} \\ 5+\sqrt{2} \end{bmatrix}$$