Datenstrukturen

Lösungen zu den Vorlesungsübungen

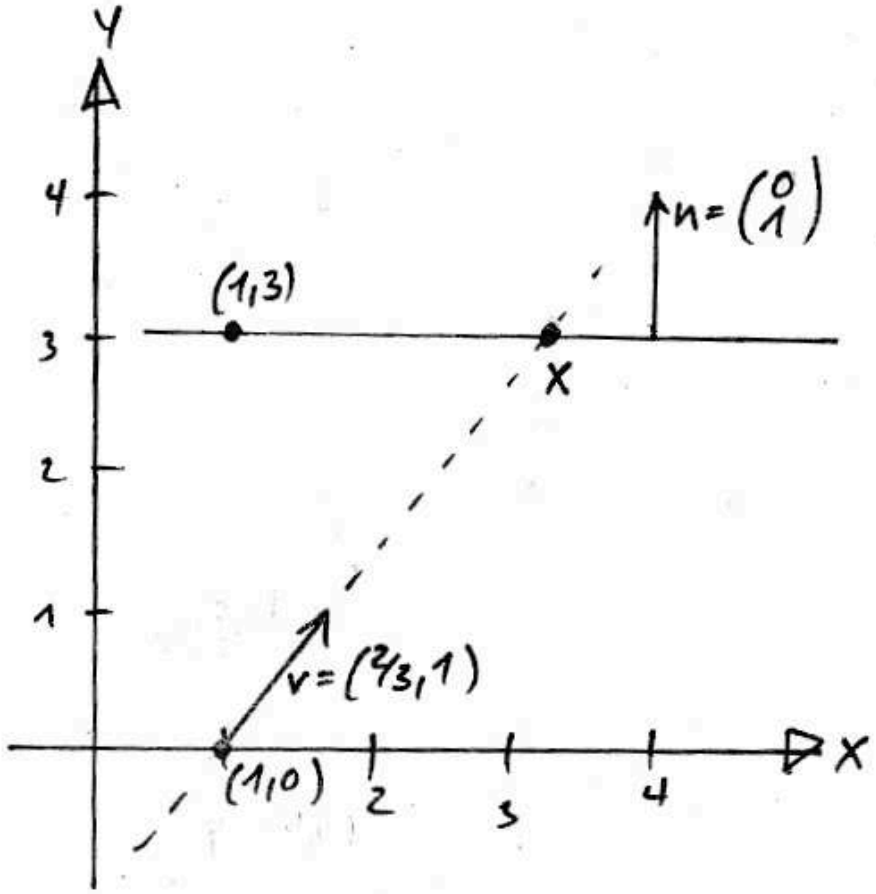
Übung: Strahl-Ebene-Schnitt

$((1,0) + \lambda\,(2/3, 1))\,(0,1) - (1,3)\,(0,1) = 0$

$\Leftrightarrow 0 + \lambda - 3 = 0$

$\Leftrightarrow \lambda = 3$

$x = (1,0) + 3\lambda\,(2/3, 1) = (3,3)$

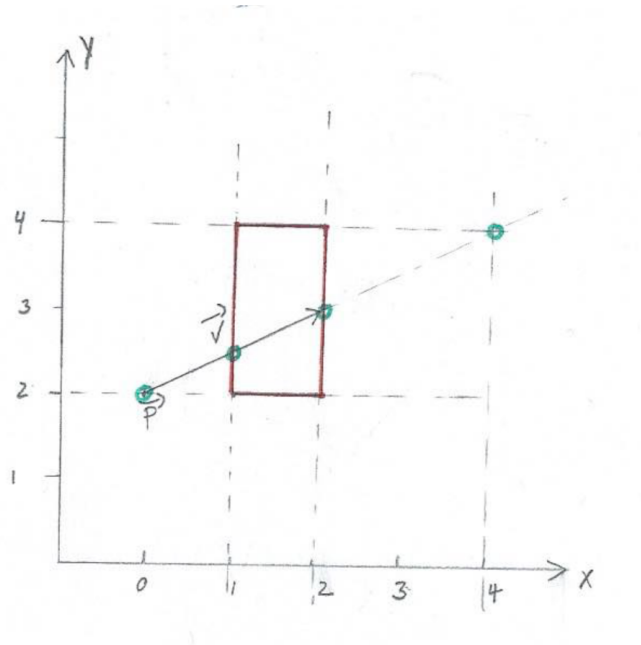


Übung: Strahl-Würfel-Schnitt

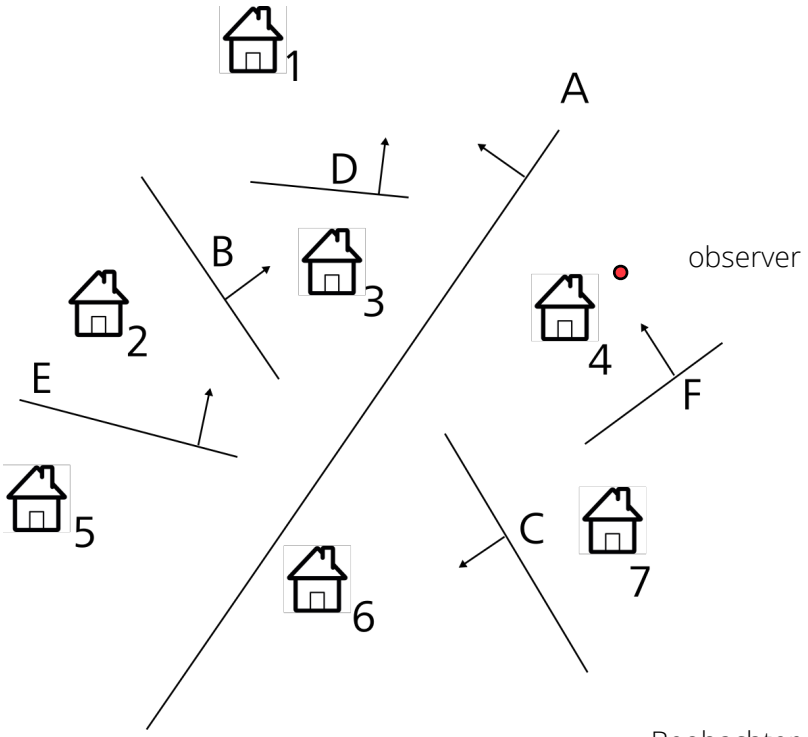
- x0 = 2, x1 = 3
- y0 = 2, y1 = 4
- px = 1, py = 2
- vx = 2, vy = 1, ergo vx > 0 und vy > 0
- x-Richtung: [t0,t1]x = [(2-1)/2, (3-1)/2] = [0.5,1]
- y-Richtung: [t0,t1]y = (2-2)/1, (4-2)/1] = [0,2]
- Schnitt: [t0,t1]x ∧ [t0,t1]y = [0.5,1]

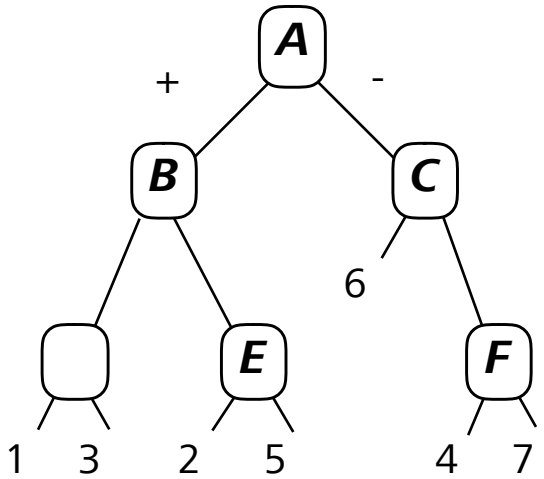
$$s = \vec{p} + t\vec{v} = \begin{pmatrix} 1 \\ 2 \end{pmatrix} + t \begin{pmatrix} 2 \\ 1 \end{pmatrix}$$

$$[t_0, t_1] = \begin{cases} \left[\frac{x_0 - p_x}{v_x}, \frac{x_1 - p_x}{v_x}\right] : v_x > 0 \\ \left[\frac{x_1 - p_x}{v_x}, \frac{x_0 - p_x}{v_x}\right] : v_x < 0 \\ [-\infty, \infty] : v_x = 0 \wedge p_x \in [x_0, x_1] \\ \{\} : sonst \end{cases}$$



Übung: Back-To-Front-Sortierung





Beobachter in F+, also:

E-, E+, D+, D-, C+, F-, F+