

# LGS


$$0.035x_1 + 3.62x_2 = 9.12$$

$$1.17x_1 + 1.42x_2 = 5.89$$

## Matrixform

$$A\mathbf{x} = \mathbf{b}$$

$$A = \begin{pmatrix} 0.035 & 3.62 \\ 1.17 & 1.42 \end{pmatrix} \quad \mathbf{x} = \begin{pmatrix} x_1 \\ x_2 \end{pmatrix} \quad \mathbf{b} = \begin{pmatrix} 9.12 \\ 5.89 \end{pmatrix}$$


$$\begin{aligned} x_1 &= 2 \\ x_2 &= 2.5 \end{aligned}$$

# Rundung

$$\pm 0.m_1m_2m_3 \times 10^E \quad E \in \mathbb{Z}$$

$$m_1 \neq 0$$

$$A = \begin{pmatrix} 0.035 & 3.62 \\ 1.17 & 1.42 \end{pmatrix}$$

$$\mathbf{b} = \begin{pmatrix} 9.12 \\ 5.89 \end{pmatrix}$$



$$\hat{A} = \begin{pmatrix} 0.350 \times 10^{-1} & 0.362 \times 10^1 \\ 0.117 \times 10^1 & 0.142 \times 10^1 \end{pmatrix} \quad \hat{\mathbf{b}} = \begin{pmatrix} 0.912 \times 10^1 \\ 0.589 \times 10^1 \end{pmatrix}$$

Pivot



$$\hat{A} = \begin{pmatrix} 0.350 \times 10^{-1} & 0.362 \times 10^1 \\ 0.117 \times 10^1 & 0.142 \times 10^1 \end{pmatrix}$$

$$\hat{L} = \begin{pmatrix} 0.100 \times 10^1 & \\ 0.334 \times 10^2 & 0.100 \times 10^1 \end{pmatrix}$$

$$\hat{R} = \begin{pmatrix} 0.350 \times 10^{-1} & 0.362 \times 10^1 \\ & -0.120 \times 10^3 \end{pmatrix}$$

$$r_{22}^{\hat{}} = 1.42 - 33.4 \cdot 3.62$$

$$= 1.42 - 120.908$$

$$\doteq 1.42 - 121 \quad \text{Runden auf 3 Stellen}$$

$$= -119.58$$

$$\doteq -120 \quad \text{Runden auf 3 Stellen}$$

$$\hat{A} = \begin{pmatrix} 0.350 \times 10^{-1} & 0.362 \times 10^1 \\ 0.117 \times 10^1 & 0.142 \times 10^1 \end{pmatrix}$$

$$\hat{L}\hat{R} = \begin{pmatrix} 0.350 \times 10^{-1} & 0.362 \times 10^1 \\ 0.117 \times 10^1 & 0.100 \times 10^1 \end{pmatrix} \quad !$$

**Durch Vorwärts/Rückwärtseinsetzen**

$$\hat{x}_1 = 0.314 \times 10^1 = 3.14$$

$$\hat{x}_2 = 0.249 \times 10^1 = 2.49$$



$$x_1 = 2$$

$$x_2 = 2.5$$

## Spaltenmaximumstrategie

$$\hat{A} = \begin{pmatrix} 0.350 \times 10^{-1} & 0.362 \times 10^1 \\ 0.117 \times 10^1 & 0.142 \times 10^1 \end{pmatrix}$$

$$P = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$$

$$\hat{L} = \begin{pmatrix} 0.100 \times 10^1 & \\ 0.299 \times 10^{-1} & 0.100 \times 10^1 \end{pmatrix}$$

$$\hat{R} = \begin{pmatrix} 0.117 \times 10^1 & 0.142 \times 10^1 \\ & 0.358 \times 10^1 \end{pmatrix}$$

**Durch Vorwärts/Rückwärtseinsetzen**

$$\hat{x}_1 = 0.200 \times 10^1 = 2.00$$

$$\hat{x}_2 = 0.250 \times 10^1 = 2.50$$



$$x_1 = 2$$

$$x_2 = 2.5$$