

$$\bullet A\vec{x} = \vec{b}$$

$$\begin{pmatrix} A_{11} & 0 & 0 & \dots & 0 & 0 \\ A_{21} & A_{22} & 0 & & 0 & \vdots \\ A_{31} & A_{32} & A_{33} & & \vdots & \vdots \\ \vdots & \vdots & \vdots & \ddots & 0 & \vdots \\ A_{n1} & A_{n2} & A_{n3} & \dots & A_{nn} & 0 \end{pmatrix} \begin{pmatrix} x_1 \\ x_2 \\ x_3 \\ \vdots \\ x_n \end{pmatrix} = \begin{pmatrix} b_1 \\ b_2 \\ b_3 \\ \vdots \\ b_n \end{pmatrix}$$

$$A_{11}x_1 = b_1 \Rightarrow x_1 = b_1/A_{11}$$

$$A_{21}x_1 + A_{22}x_2 = b_2 \Rightarrow x_2 = \frac{b_2 - A_{21}x_1}{A_{22}}$$

$$A_{31}x_1 + A_{32}x_2 + A_{33}x_3 = b_3 \Rightarrow x_3 = \frac{b_3 - A_{31}x_1 - A_{32}x_2}{A_{33}}$$

⋮

$$A_{n1}x_1 + A_{n2}x_2 + A_{n3}x_3 + \dots + A_{nn}x_n = b_n \Rightarrow$$

$$x_n = \frac{b_n - A_{n1}x_1 - A_{n2}x_2 - A_{n3}x_3 - \dots - A_{n,n-1}x_{n-1}}{A_{nn}}$$

$$\Rightarrow x_i = \frac{b_i - \sum_{j=1}^{i-1} A_{ij}x_j}{A_{ii}}$$