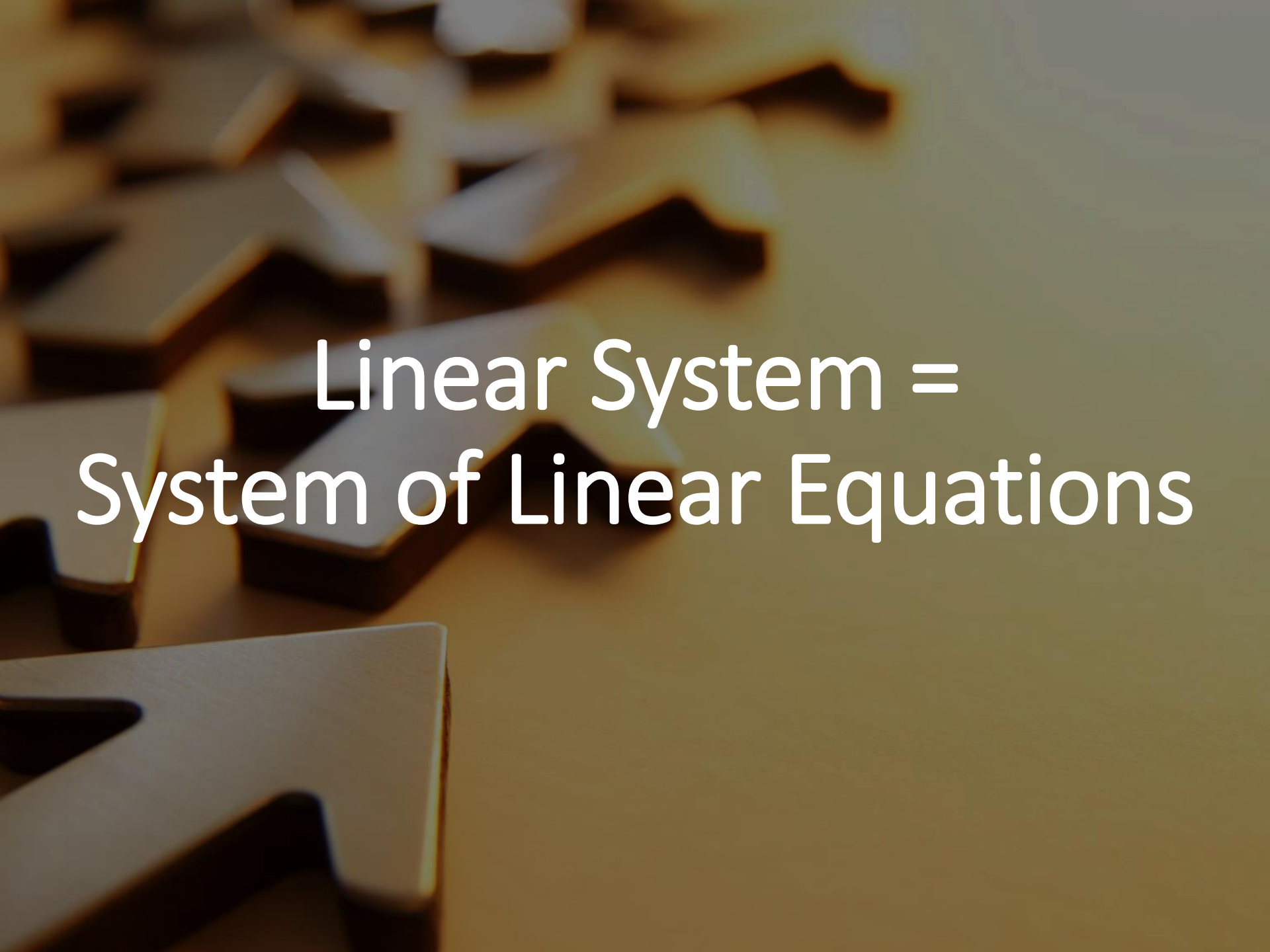
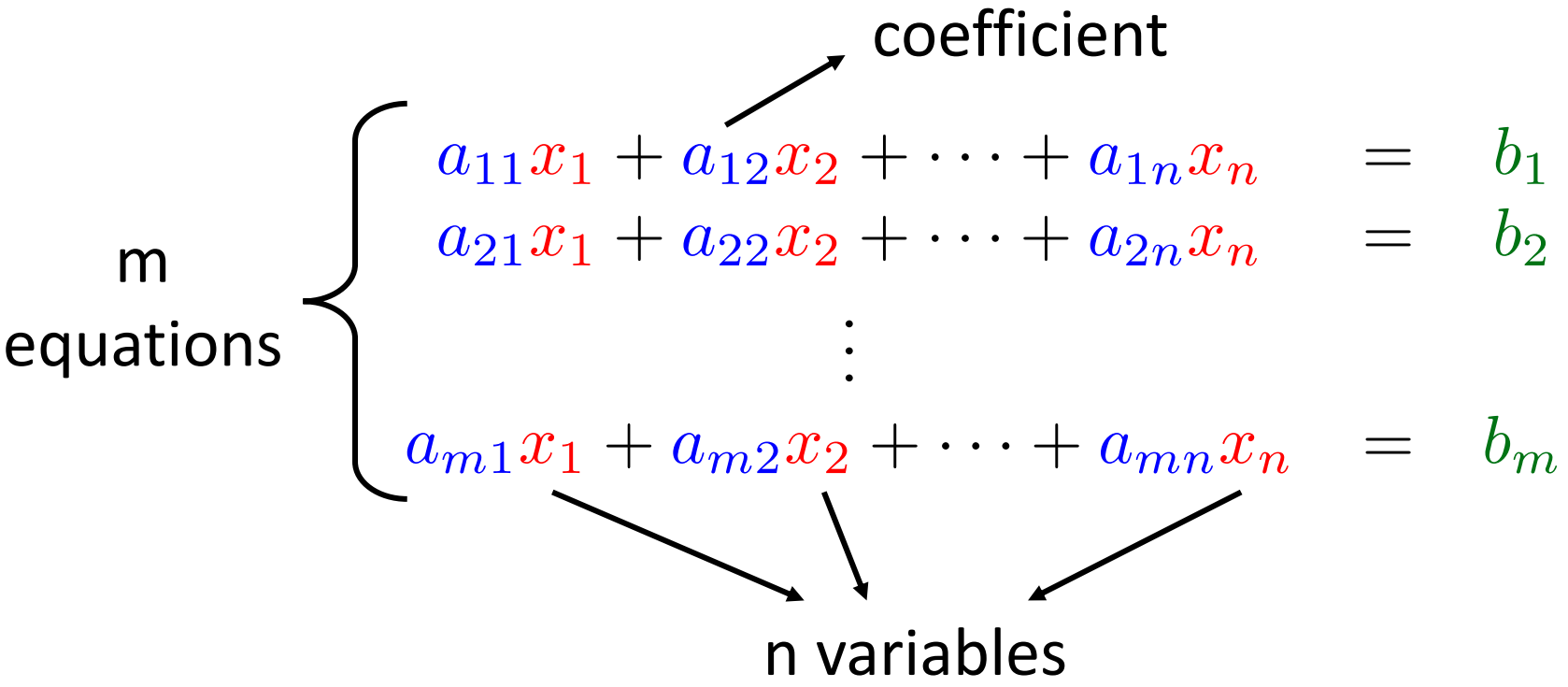

Linear System =
System of Linear Equations

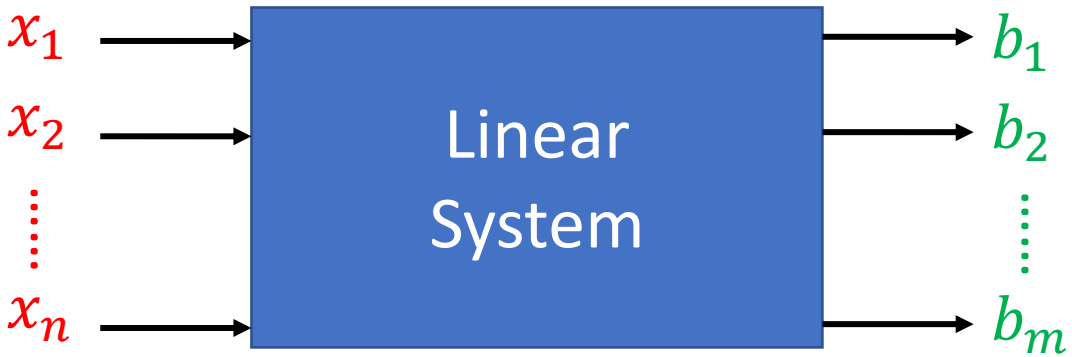
System of Linear Equations

多元一次聯立方程式



In this course, m and n can be large

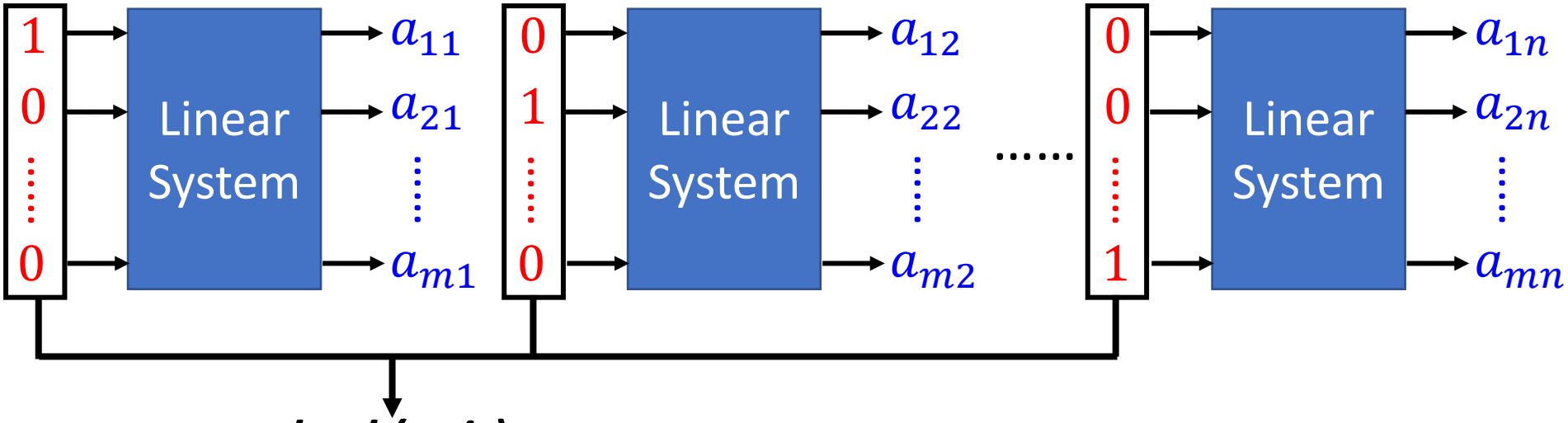
Linear System
= System of Linear Equations



Next page ⇩ ⇧ Trivial!

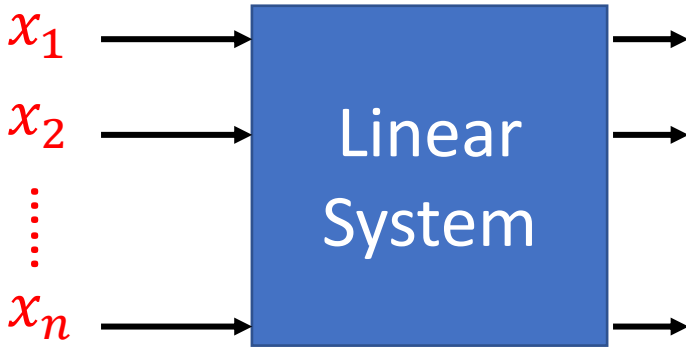
$$
\begin{aligned}
a_{11}x_1 + a_{12}x_2 + \cdots + a_{1n}x_n &= b_1 \\
a_{21}x_1 + a_{22}x_2 + \cdots + a_{2n}x_n &= b_2 \\
&\vdots \\
a_{m1}x_1 + a_{m2}x_2 + \cdots + a_{mn}x_n &= b_m
\end{aligned}
$$

A linear system → A system of linear equations



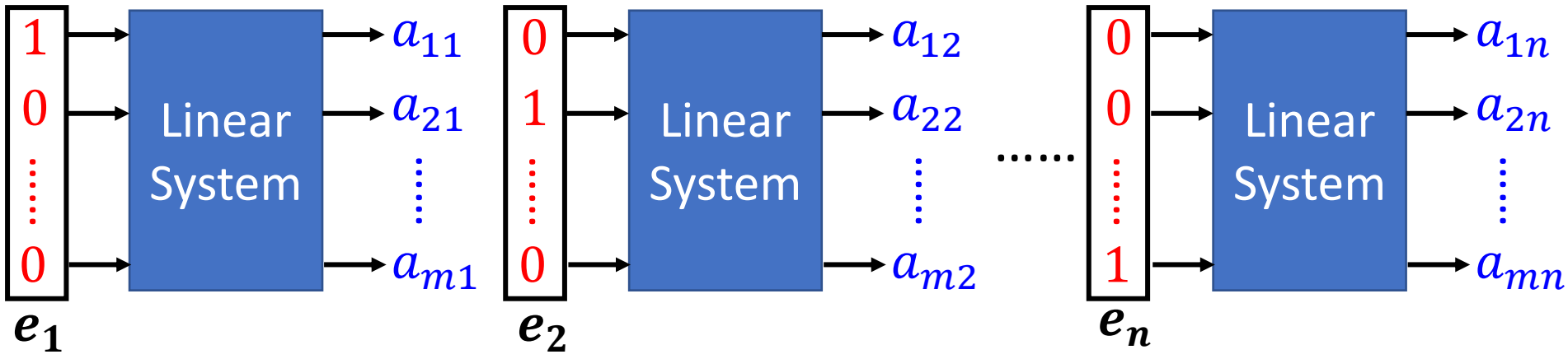
standard (unit) vector

(only one element is “1”,
the rest elements are “0”)



b_1
b_2
b_m

A linear system → A system of linear equations

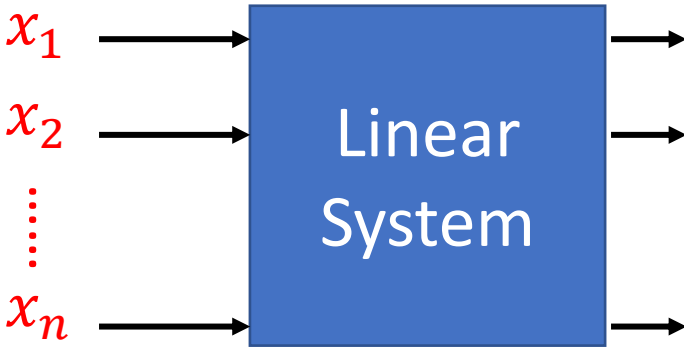


standard (unit) vector

(only one element is "1",
the rest elements are "0")

$$\boldsymbol{v} = \begin{bmatrix} v_1 \\ v_2 \end{bmatrix} = v_1 \begin{bmatrix} 1 \\ 0 \end{bmatrix} + v_2 \begin{bmatrix} 0 \\ 1 \end{bmatrix}$$

$$= v_1 \boldsymbol{e_1} + v_2 \boldsymbol{e_2}$$



b_1
b_2
b_m

A linear system → A system of linear equations