

가우스 조던 소거법 예제
(Gauss-Jordan elimination example)

Gauss-Jordan elimination example

▶ Start

▶ End

Gauss-Jordan elimination example

▶ Start

▶ End

$$\begin{cases} x + 2y = 3 \\ 4x + 5y = 6 \end{cases}$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\begin{cases} x + 2y = 3 \\ 4x + 5y = 6 \end{cases} \quad \begin{pmatrix} 1 & 2 \\ 4 & 5 \end{pmatrix}$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\begin{cases} x + 2y = 3 \\ 4x + 5y = 6 \end{cases} \quad \begin{pmatrix} 1 & 2 \\ 4 & 5 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} =$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\begin{cases} x + 2y = 3 \\ 4x + 5y = 6 \end{cases} \quad \begin{pmatrix} 1 & 2 \\ 4 & 5 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 3 \\ 6 \end{pmatrix}$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ -3y = -6 \end{array} \right.$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \\ x + 2y = 3 \\ -3y = -6 \end{array} \right. \quad \left(\begin{array}{cc|c} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 1 & 2 & 3 \\ 0 & -3 & -6 \end{array} \right)$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \\ x + 2y = 3 \\ -3y = -6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \\ 1 & 2 \\ 0 & -3 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 6 \\ 3 \\ -6 \end{array} \right)$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \\ x + 2y = 3 \\ -3y = -6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \\ 1 & 2 \\ 0 & -3 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 6 \\ 3 \\ -6 \end{array} \right)$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \\ x + 2y = 3 \\ -3y = -6 \\ x + 2y = 3 \\ y = 2 \end{array} \right. \quad \begin{pmatrix} 1 & 2 \\ 4 & 5 \\ 1 & 2 \\ 0 & -3 \\ 1 & 2 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 3 \\ 6 \\ 3 \\ -6 \\ 3 \\ 2 \end{pmatrix}$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \\ x + 2y = 3 \\ -3y = -6 \\ x + 2y = 3 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \\ 1 & 2 \\ 0 & -3 \\ 1 & 2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 6 \\ 3 \\ -6 \end{array} \right)$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \\ x + 2y = 3 \\ -3y = -6 \\ x + 2y = 3 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \\ 1 & 2 \\ 0 & -3 \\ 1 & 2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \\ x \\ y \\ x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 6 \\ 3 \\ -6 \\ 3 \\ 2 \end{array} \right)$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \\ x + 2y = 3 \\ -3y = -6 \\ x + 2y = 3 \\ y = 2 \end{array} \right. \quad \begin{pmatrix} 1 & 2 \\ 4 & 5 \\ 1 & 2 \\ 0 & -3 \\ 1 & 2 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 3 \\ 6 \\ 3 \\ -6 \\ 3 \\ 2 \end{pmatrix}$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \\ x + 2y = 3 \\ -3y = -6 \\ x + 2y = 3 \\ y = 2 \\ x = -1 \end{array} \right.$$

$$\begin{pmatrix} 1 & 2 \\ 4 & 5 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 3 \\ 6 \end{pmatrix}$$
$$\begin{pmatrix} 1 & 2 \\ 0 & -3 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 3 \\ -6 \end{pmatrix}$$
$$\begin{pmatrix} 1 & 2 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ -3y = -6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & -3 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ -6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 2 \end{array} \right)$$
$$\left\{ \begin{array}{l} x = -1 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right)$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ -3y = -6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & -3 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ -6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 2 \end{array} \right)$$
$$\left\{ \begin{array}{l} x = -1 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) =$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ -3y = -6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & -3 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ -6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 2 \end{array} \right)$$
$$\left\{ \begin{array}{l} x = -1 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} -1 \\ 2 \end{array} \right)$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \end{array} \right.$$

$$\begin{pmatrix} 1 & 2 \\ 4 & 5 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 3 \\ 6 \end{pmatrix}$$

$$\left\{ \begin{array}{l} x + 2y = 3 \\ -3y = -6 \end{array} \right.$$

$$\begin{pmatrix} 1 & 2 \\ 0 & -3 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 3 \\ -6 \end{pmatrix}$$

$$\left\{ \begin{array}{l} x + 2y = 3 \\ y = 2 \end{array} \right.$$

$$\begin{pmatrix} 1 & 2 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$$

$$\left\{ \begin{array}{l} x = -1 \\ y = 2 \end{array} \right.$$

$$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} -1 \\ 2 \end{pmatrix}$$

$$\begin{pmatrix} 1 & -2 \\ 0 & 1 \end{pmatrix}$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ -3y = -6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & -3 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ -6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 2 \end{array} \right)$$
$$\left\{ \begin{array}{l} x = -1 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} -1 \\ 2 \end{array} \right)$$

$$\left(\begin{array}{cc} 1 & -2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{cc} 1 & 0 \\ 0 & -\frac{1}{3} \end{array} \right)$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ -3y = -6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & -3 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ -6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 2 \end{array} \right)$$
$$\left\{ \begin{array}{l} x = -1 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} -1 \\ 2 \end{array} \right)$$

$$\left(\begin{array}{cc} 1 & -2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{cc} 1 & 0 \\ 0 & -\frac{1}{3} \end{array} \right) \left(\begin{array}{cc} 1 & 0 \\ -4 & 1 \end{array} \right)$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ -3y = -6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & -3 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ -6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 2 \end{array} \right)$$
$$\left\{ \begin{array}{l} x = -1 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} -1 \\ 2 \end{array} \right)$$

$$\left(\begin{array}{cc} 1 & -2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{cc} 1 & 0 \\ 0 & -\frac{1}{3} \end{array} \right) \left(\begin{array}{cc} 1 & 0 \\ -4 & 1 \end{array} \right) \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) =$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ -3y = -6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & -3 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ -6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 2 \end{array} \right)$$
$$\left\{ \begin{array}{l} x = -1 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} -1 \\ 2 \end{array} \right)$$

$$\left(\begin{array}{cc} 1 & -2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{cc} 1 & 0 \\ 0 & -\frac{1}{3} \end{array} \right) \left(\begin{array}{cc} 1 & 0 \\ -4 & 1 \end{array} \right) \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) = \left(\begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right)$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ -3y = -6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & -3 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ -6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 2 \end{array} \right)$$
$$\left\{ \begin{array}{l} x = -1 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} -1 \\ 2 \end{array} \right)$$

$$\left(\begin{array}{cc} 1 & -2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{cc} 1 & 0 \\ 0 & -\frac{1}{3} \end{array} \right) \left(\begin{array}{cc} 1 & 0 \\ -4 & 1 \end{array} \right) \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) = \left(\begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right)$$

$$\left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) =$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ -3y = -6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & -3 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ -6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 2 \end{array} \right)$$
$$\left\{ \begin{array}{l} x = -1 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} -1 \\ 2 \end{array} \right)$$

$$\left(\begin{array}{cc} 1 & -2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{cc} 1 & 0 \\ 0 & -\frac{1}{3} \end{array} \right) \left(\begin{array}{cc} 1 & 0 \\ -4 & 1 \end{array} \right) \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) = \left(\begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right)$$

$$\left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) = \left(\begin{array}{cc} 1 & 0 \\ 4 & 1 \end{array} \right)$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ -3y = -6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & -3 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ -6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 2 \end{array} \right)$$
$$\left\{ \begin{array}{l} x = -1 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} -1 \\ 2 \end{array} \right)$$

$$\left(\begin{array}{cc} 1 & -2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{cc} 1 & 0 \\ 0 & -\frac{1}{3} \end{array} \right) \left(\begin{array}{cc} 1 & 0 \\ -4 & 1 \end{array} \right) \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) = \left(\begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right)$$

$$\left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) = \left(\begin{array}{cc} 1 & 0 \\ 4 & 1 \end{array} \right) \left(\begin{array}{cc} 1 & 0 \\ 0 & -3 \end{array} \right)$$

Gauss-Jordan elimination example

▶ Start

▶ End

$$\left\{ \begin{array}{l} x + 2y = 3 \\ 4x + 5y = 6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ -3y = -6 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & -3 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ -6 \end{array} \right)$$
$$\left\{ \begin{array}{l} x + 2y = 3 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} 3 \\ 2 \end{array} \right)$$
$$\left\{ \begin{array}{l} x = -1 \\ y = 2 \end{array} \right. \quad \left(\begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) = \left(\begin{array}{c} -1 \\ 2 \end{array} \right)$$

$$\left(\begin{array}{cc} 1 & -2 \\ 0 & 1 \end{array} \right) \left(\begin{array}{cc} 1 & 0 \\ 0 & -\frac{1}{3} \end{array} \right) \left(\begin{array}{cc} 1 & 0 \\ -4 & 1 \end{array} \right) \left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) = \left(\begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right)$$

$$\left(\begin{array}{cc} 1 & 2 \\ 4 & 5 \end{array} \right) = \left(\begin{array}{cc} 1 & 0 \\ 4 & 1 \end{array} \right) \left(\begin{array}{cc} 1 & 0 \\ 0 & -3 \end{array} \right) \left(\begin{array}{cc} 1 & 2 \\ 0 & 1 \end{array} \right)$$

Github:

<https://min7014.github.io/math20240606001.html>

Click or paste URL into the URL search bar,
and you can see a picture moving.