

Person 1: X_1
 $\begin{bmatrix} 4 & 0.2 & 9 & -0.2 & -8.1 \end{bmatrix}$

Person 1: $0.7X_1 + 0.2X_2 + 0.1X_3 = Y_1$

Person 2: X_2
 $\begin{bmatrix} \dots \end{bmatrix}$

Person 2: $0.1X_1 + 0.8X_2 + 0.2X_3 = Y_2$

Person 3: X_3
 $\begin{bmatrix} \dots \end{bmatrix}$

Person 3: $0.03X_1 + 0.1X_2 + 0.5X_3 = Y_3$

$$\begin{bmatrix} Y_1 \\ Y_2 \\ Y_3 \end{bmatrix}_{3 \times n} = \begin{bmatrix} 0.7 & 0.2 & 0.1 \\ 0.1 & 0.8 & 0.2 \\ 0.03 & 0.1 & 0.5 \end{bmatrix}_{3 \times 3} \begin{bmatrix} X_1 \\ X_2 \\ X_3 \\ \vdots \end{bmatrix}_{3 \times n}$$

$3 \times n$

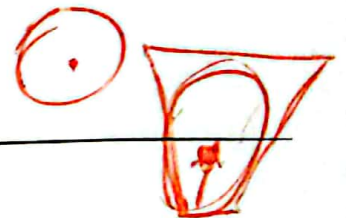
3×3

$3 \times n$

$Y \in \mathbb{R}^{3 \times n}$
 $W \in \mathbb{R}^{3 \times 3}$

$$Y = W X$$

$$X = W^{-1} Y$$



$n = 1000000$

~~W~~

$$Y = W X$$

$3 \times n \quad 3 \times 3 \quad 3 \times n$

decompose Y into $W \in \mathbb{R}^{3 \times 3}$ by $X \in \mathbb{R}^{3 \times n}$

$$Y = I Y$$

$$Y = W X = \underbrace{W A}_{W'} \underbrace{A^{-1} X}_{X'} = W' X'$$