

x_i

$$x_1 + x_2 + x_3 + x_4 = \sum_{i=1}^4 x_i$$

$$x_1 + x_2 + \dots + x_N = \sum_{i=1}^N x_i = x_1 + \sum_{i=2}^N x_i =$$
$$= \left(\sum_{i=1}^{N-1} x_i \right) + x_N =$$
$$= x_1 + \left(\sum_{i=2}^{N-1} x_i \right) + x_N$$

$$\sum_{i=1}^N x_i = \sum_{i=0}^{N-1} x_{i+1}$$

x_i
 y_i

$$\sum_{i=1}^N x_i^2 y_i = x_1^2 y_1 + x_2^2 y_2 + \dots + x_N^2 y_N$$

$$\sum_{i=1}^3 x_i y_{i+1} = x_1 y_2 + x_2 y_3 + x_3 y_4$$

$$\sum_{i=1}^4 \left(\sum_{j=1}^3 x_i y_j \right) = x_1 y_1 + x_1 y_2 + x_1 y_3 + x_2 y_1 + x_2 y_2 + x_2 y_3 +$$

$i=1 \qquad i=2 \qquad i=3 \qquad i=4$

$$\sum_{i=1}^4 x_i \sum_{j=1}^3 y_j$$

for i in range(1,5):
 $x_i \leftarrow \dots$

$$\sum_{i=1}^4 \left(\sum_{j=i}^3 x_j y_j \right) = \sum_{j=1}^3 x_j y_j + \sum_{j=2}^3 x_j y_j + \sum_{j=3}^3 x_j y_j = x_1 y_1 + x_2 y_2 + x_3 y_3 + x_2 y_2 + x_3 y_3 + x_3 y_3$$

$\sum_{j=4}^3 x_j y_j$

$$\prod_{i=1}^4 x_i = x_1 \cdot x_2 \cdot x_3 \cdot x_4$$

$$\prod_{i=1}^N \sum_{j=1}^M x_i y_j$$

$$\sum_{j=1}^M \prod_{i=1}^N x_i y_j$$

$$\sum_{i=1}^N \sum_{j=1}^M x_i y_j =$$

$$\sum_{j=1}^M \sum_{i=1}^N x_i y_j =$$

$$\sum_{i=1}^N x_i \sum_{j=1}^M y_j$$

$$\sum_{j=1}^M y_j \sum_{i=1}^N x_i$$

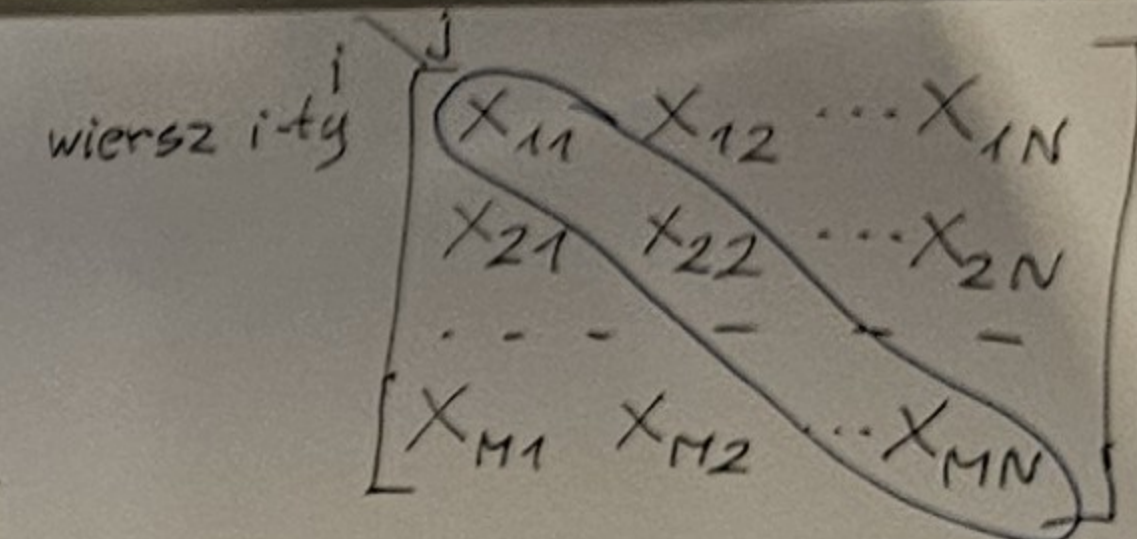
$$\sum_{i=1}^N x_{ii}$$

$$\sum_{j=1}^N x_{ij}$$

x_{ij}

$i=1, 2, \dots, M$

$j=1, 2, \dots, N$



dla $M=N$ $x_{ij}^{(j)}$

$$\sum_{i=1}^N \sum_{j=1}^N x_{ij}$$

W domu

x_{ij} - kwadratowa $M=N$



$$2^{(\frac{1}{2} + \frac{1}{3}) \cdot 4}$$

$$\begin{bmatrix} x_1^{(1)} & x_1^{(2)} & \dots & x_1^{(N)} \\ x_2^{(1)} & x_2^{(2)} & \dots & x_2^{(N)} \\ \vdots & \vdots & \ddots & \vdots \\ x_M^{(1)} & x_M^{(2)} & \dots & x_M^{(N)} \end{bmatrix}$$