## Approximation

Given coordinates $\left(X_{i}, Y_{i}\right)$ of $N$ points of the plane, calculate the coefficients $A, B, C$, and $D$ of the polynomial $W(X)=A^{*} X^{3}+B^{*} X^{2}+C^{*} X+D$, such that value of the function
$F(X)=\left(Y_{1}-W\left(X_{1}\right)\right)^{2}+\left(Y_{2}-W\left(X_{2}\right)\right)^{2}+\ldots+\left(Y_{N}-W\left(X_{N}\right)\right)^{2}$ is minimized.

## Input

The first line of input consists of a single positive integer $N(5<=N<=50)$, representing the number of points. Each of the following N lines contains the coordinates $\mathrm{X}_{\mathrm{i}}, \mathrm{Y}_{\mathrm{i}}\left(-1000<=\mathrm{X}_{\mathrm{i}}, \mathrm{Y}_{\mathrm{i}}<=1000\right)$, given with two digits precision after the decimal dot.

## Output

Output a single line containing the coefficients $A, B, C, D$ of the sought polynomial, separated by spaces. Print all numbers with two digits precision after the decimal dot.

## Example

Input:

9
$\begin{array}{ll}-4.00 & -74.00\end{array}$
$-3.00 \quad-26.00$
$-2.00 \quad 0.00$
$-1.00 \quad 10.00$
$0.00 \quad 10.00$
$1.00 \quad 6.00$
$2.00 \quad 4.00$
$3.00 \quad 10.00$
$4.00 \quad 30.00$

## Output:

1.00-2.00-3.00 10.00

## Scoring

For solving this problem you will score 10 points.

