Eternal Feather

Input file:	`standard input`
Output file:	`standard output`
Time limit:	5 seconds
Memory limit:	1024 megabytes

Fly high, make it. Get to the new world that I seek. Someday, so I believe. —— <euphoric field>

Yuuko dwelled solely in Otoha, a place nestled in the northern hemisphere. There, she dedicated herself to guiding adolescents, gently unraveling the knots of their confusion. As she journeyed through countless inquiries, she eventually encountered the very last question. In that pivotal moment, Yuu was finally struck by a profound realization: the girl he had been yearning for was still there, patiently waiting for him.

Amamiya Yuuko

Given two **coprime** parametes p, q, sequence $f(i)$ is calculated via following formula.

$$\begin{cases} f(0) = 0, \\ f(1) = 1, \\ f(i) = p \cdot f(i-1) + q \cdot f(i-2) \quad (i \geq 2) \end{cases}$$

Yuuko wants to calculate the following summation:

$$\sum_{a=1}^{n} \sum_{b=1}^{n} \sum_{c=1}^{m} \gcd(f(c^a + 1), f(c^b + 1))$$

Since the result is way too large, you are supposed to answer it modulo 1225.

Input

The first line contains four integers n, m, p, q ($1 \leq n \leq 10^5, 1 \leq m, p, q \leq 100$). It is guaranteed that $\gcd(p, q) = 1$.

Output

Output a integer, standing for the results.

Examples

standard input	standard output
5 5 3 4	953
3 3 1 1	662
20 10 11 9	333

Note

Two becomes one, and it through all eternity.

Merry Christmas, Yuuko.

Ever Forever