Powers of a matrix P61833_en

Given a 2×2 matrix M of natural numbers, a natural number n and a natural number m, compute M^n. To avoid overflows, compute every element of M^n mod m.

Input

Input consists of several cases, each with M_{11}, M_{12}, M_{21} and M_{22} in this order, followed by n and m. Assume that the elements of M are not larger than 500, $0 \leq n \leq 10^9$, and $2 \leq m \leq 1000$.

Output

For every case, print the elements of M^n mod m in two lines following the format of the sample. Print a line with 10 dashes after every matrix.

Sample input

```
2 7
1 4
2 100

2 7
1 4
2 5

15 2
3 4
0 1000

500 499
499 498
123456789 1000
```

Sample output

```
11 42
6 23
----------
1 2
1 3
----------
1 0
0 1
----------
792 815
815 422
----------
```

Problem information

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