

## Problem D. Digit Sum Problem

Input file:            `standard input`  
Output file:        `standard output`  
Time limit:         3 seconds  
Memory limit:      1024 megabytes

For a nonnegative integer  $x$ , let  $f(x)$  and  $g(x)$  denote the digit sum of  $x$  in binary and ternary, respectively.

Given  $n, a, b, c$ , compute

$$\left( \sum_{i=1}^n a^i b^{f(i)} c^{g(i)} \right) \bmod 998244353.$$

### Input

In the first line,  $n, a, b, c$  ( $1 \leq n \leq 10^{13}, 1 \leq a, b, c < 998244353$ ).

### Output

One integer — the answer.

### Examples

| standard input                    | standard output |
|-----------------------------------|-----------------|
| 123456 12345 234567 3456789       | 664963464       |
| 9876543210987 12816 837595 128478 | 7972694         |