Just sort

SEASON 9 – SIXTH ROUND

Once upon a time, there was an increasing integer sequence $A_0, A_1, A_2, \ldots A_{n-1}$. One day, an evil ghost came and made a new sequence $B^r_0 \ldots B^r_{n-1}$, where $B^r_i = A_i - (A_i \bmod 3) * (A_i \bmod 5)$. Your task is to sort in increasing order the sequence B^r.

As to not slow down your solution with input and output, we will:

- Give you N, A_0 и `g_seed`. This procedure is used to generate the rest of A:

```
int g_seed; // from input

unsigned int fastrand() {
    g_seed = 214013*g_seed + 2531011;
    return (g_seed>>16) & 0x7FFF;
}

int next(int prev) {
    return 1 + prev + (fastrand() & 0b111);
}
```

  Препишете внимателно константите във функциите `fastrand` и `next`.

  Generate $A_i =$ `next(`A_{i-1}`)`, $i \neq 0$

- We'll call B the sorted in increasing order B^r
- Print the result of the following equation. Notice it refers to the sorted sequence B.

$$\left(\sum_{i=0}^{N-1} 139^i B_i \right) mod\ 2^{64}$$

Input

From the only line of the input file `justsort.in` the integers N, A_0 и `g_seed` are entered, separated with spaces.

Output

On the only line of the output file `justsort.out` print the answer.

Constraints

$1 \leq N \leq 2*10^7$

$10 \leq A_i \leq 10^9$

$0 \leq$ `g_seed` $\leq 10^9$

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Time limit: 2 seconds
Memory limit: 32 MB

Examples

Input (`justsort.in`)	Output (`justsort.out`)	Notes
8 17 1213	42397401520864154	a={17 25 26 33 38 41 42 43} b={13 25 24 33 32 39 42 40}
5000 40 8765	606307377094608339	