Problem H. Hash Collision

Input file:	*standard input*
Output file:	*standard output*
Time limit:	5 seconds
Memory limit:	512 mebibytes

As a lazy guy, Shik uses hash heavily when solving problems related to string. Here is a simple hash function implemented in C.

```
int hash(int n, int m, int p, const char *s) {
    int h = 0;
    for (int i = 0; i < n; i++) h = (h * p + s[i]) % m;
    return h;
}
```

If an (unordered) pair of different strings has the same hash values, we say this pair is a "collision pair". Shik claims that he is very lucky and the probability of hash collision is negligible. To verify his claim, you want to calculate the number of collision pairs given n, m, p. Here we only consider the strings consisting of only uppercase letters '`A`' to '`Z`'. Note that because n is given, the length of string must be exactly n. Since the number could be very large, you only need to output it modulo $10^6 + 3$.

Input

The input contains exactly one line with three integers n, m, p

- $1 \le n \le 10^6$
- $2 \le p < m \le 30000$
- m and p are primes.

Output

Please output the number of collision pairs modulo $10^6 + 3$.

Examples

standard input	standard output
1 3 2	100
2 3 2	75825
21 13 5	142108
50216 9973 131	405787