Monkey Country

Time limit: 3.0s **Memory limit:** 512M

Victor lives in a monkey country where every day, out of the K monkeys who have money, the top $\left\lfloor \frac{K \cdot P}{Q} \right\rfloor$ of monkeys earn one dollar while everyone else loses one dollar. When a monkey runs out of money, he goes bankrupt and ~~loses his citizenship too~~ is no longer one of the K monkeys with money. At first, there are N monkeys and the i^{th} monkey has a_i dollars. Each monkey has a distinct number of dollars to begin with. Victor would like to know how many days there are until each monkey runs out of money.

Input Specification

The first line contains integers N, P, and Q ($1 \leq N, P, Q \leq 10^7$, $P < Q$), the number of monkeys in the country and the special numbers P and Q.

The next line will have a list a of N integers, ($1 \leq a_i \leq 10^9$), the i^{th} of which is how many dollars the i^{th} monkey has. No two monkeys have the same amount of money ($a_i \neq a_j$ if $i \neq j$). The amount of money of the monkeys are **sorted in increasing order**.

Output Specification

In one line, print N integers, the i^{th} of which is how many days there are until the i^{th} monkey runs out of money **modulo** $10^9 + 7$.

Sample Input 1

```
5 1 2
1 2 3 4 5
```

Sample Output 1

```
1 2 3 8 21
```

Sample Input 2

```
2 1 2
999999999 1000000000
```

Sample Output 2

```
999999999 999999984
```

Explanation for Sample 1

At the start, the money count is `1 2 3 4 5`.

On day 1, the top $\left\lfloor \frac{5 \cdot 1}{2} \right\rfloor = 2$ monkeys gain money, and everyone else loses money. Thus, the new money count becomes `0 1 2 5 6`. Here, monkey 1 goes bankrupt on day 1.

The rest of the days are:

`0 0 1 6 7` monkey 2 goes bankrupt on day 2.

`0 0 0 5 8` monkey 3 goes bankrupt on day 3.

`0 0 0 4 9`

`0 0 0 3 10`

`0 0 0 2 11`

`0 0 0 1 12`

`0 0 0 0 13` monkey 4 goes bankrupt on day 8.

`0 0 0 0 12`

...

`0 0 0 0 1`

`0 0 0 0 0` The monkey game finally ends when monkey 5 goes bankrupt on day 21.