SAC '22 Code Challenge 3 P1 - Hair Hazards

Time Limit: 1.0s **Memory Limit:** 256M

When school finishes, Fayez decides to experiment with new hair lengths.

Currently, Fayez has a hair length of H cm.

Whenever he visits his barber in the summer, his hair will be cut S cm shorter.

He will visit his barber Q times and wants to know his hair length after each haircut.

Can you help him?

Input Specification

The first line will contain H $(100 \leq H \leq 100\,000)$, the length of Fayez's hair initially.

The next will contain S $(1 \leq S \leq 1\,000)$, the length of hair trimmed off from each haircut.

The next line will contain Q $(1 \leq Q \leq \lfloor \frac{H-1}{S} \rfloor)$, the number of haircuts Fayez will get.

Output Specification

Output the length of Fayez's hair after each haircut in cm.

Sample Input

```
200
2
3
```

Sample Output

```
198
196
194
```

SAC '22 Code Challenge 3 P2 - Unicycle License

Time Limit: 1.0s **Memory Limit:** 256M

After having his driver's license revoked for speeding, Zain is forced to bike to school on his electric unicycle.

On his unicycle, his speed in metres can be modelled by the function $S(t) = 12t^2 - 5t + 1$, where t is the time in seconds that have passed (and must be positive).

Since Zain is a model citizen (and does not want his electric unicycle license revoked as well), he will stop when he reaches a speed above M.

Because Zain does not trust himself to stop, he entrusts you with telling him the exact time to stop within an absolute error of 10^{-6}.

Can you save Zain's license?

Input Specification

The first line will contain M $(1 \leq M \leq 10^9)$, the speed where Zain dismounts his unicycle.

Output Specification

Output the time Zain should dismount his unicycle in seconds.

Note: A solution will be accepted with up to an error of 10^{-6}.

Sample Input

```
15
```

Sample Output

```
1.308365
```

SAC '22 Code Challenge 3 P3 - Bob Sort

Time Limit: 1.0s **Memory Limit:** 256M
Java: 1.5s
Python: 2.0s

To celebrate the upcoming CCC (Canadian Computing Contest), Max decided to define a new sorting algorithm called *Bob Sort*.

Bob Sort involves $\lfloor \log_{10}(\max(A_i)) + 1 \rfloor$ rounds of sorting.

For the r^{th} round, Bob Sort looks at the r rightmost digits, d_i:

If there are fewer than r digits in element i, the left-aligned missing digits are set to 0.

Then, Bob Sort sorts the elements by their corresponding value (d_i) in non-decreasing order.

Can you Bob Sort the array into increasing order?

Constraints

$1 \leq N \leq 100\,000$

$1 \leq A_i \leq 10^9$

All A_i are distinct.

Input Specification

The first line will contain N, the number of elements in the array.

The next line will contain N space-separated integers, the elements of the array.

Output Specification

Output $\lfloor \log_{10}(\max(A_i)) + 1 \rfloor$ lines, the array after each round of sorting.

Note: Within a round, ties do not need to be broken between elements with the same value, d_i.

Sample Input 1

```
6
2 105 12 1 15 65
```

Sample Output 1

```
1 2 12 105 15 65
1 2 105 12 15 65
1 2 12 15 65 105
```

Sample Input 2

```
1
100
```

Sample Output 2

```
100
100
100
```