



Task **eight.**

Target:

- Solve some problems using frequency array.

Resources:

- Google it!
- Session link (for frequency array): [link](#)

Task:

Problem 1:

Given **2** numbers N , M and an array A of N numbers. For every number from **1** to M , print how many times this number **appears** in this array.

Input

First line contains two numbers N , M

Second line contains N numbers ($1 \leq A_i \leq M$)

Output

Print M lines, the i th line should contain number of times that the number i appears in A

Example

input

```
10 5
1 2 3 4 5 3 2 1 5 3
```

output

```
2
2
3
1
2
```

Note

Numbers from 1 to 5 appearance are :

- 1 appears **2** times in the array .
- 2 appears **2** times in the array.
- 3 appears **3** times in the array.
- 4 appears **once** in the array.
- 5 appears **2** times in the array

Problem 2:

Given a string S . Determine how many times does each letter **occurred** in S .

Input

Only one line contains the string S ($1 \leq |S| \leq 10^7$) where $|S|$ is the length of the string and it consists of only **lowercase** English letters.

Output

For each character that appears in S , print a single line that contains the following format: " $X : Y$ " where X is the letter and Y is the number of times that letter X occurred in S .

Note: you must print letters in **ascending** order.

Examples

input

```
aaabbc
```

output

Copy

```
a : 3
```

```
b : 2
```

```
c : 1
```

input

```
regff
```

output

```
e : 1
```

```
f : 2
```

```
g : 1
```

```
r : 1
```

Problem 3 :

Given a string S . Print S after sorting it.

Note : don't use any algorithm for sort you should solve it using frequency array

Input

One line contains a string S consists of lowercase English letters.

Output

Print S after sorting it.

Examples

input

```
debaab
```

output

Copy

```
aabbde
```

input

Copy

```
egypt
```

output

Copy

```
egpty
```

Deadline:

15/02/2024 at 11:59 PM