Problem 1 – Medenka

You are given a medenka with nuts inside. Calculate the number of ways you can break the medenka so that each piece contains exactly one nut. For example, the medenka **1 0 1 0 1** can be broken into:

`10|10|1, 1|010|1, 10|1|01, 1|01|01`

Input

On the first input line you are given the medenka - a sequence of integers separated by a single space.

Output

Print all ways the medenka can be cut. Display the cuts with **"|"**.

The order of printing does not matter.

Constraints

- The length of the sequence will be in the range [1…30].
- The sequence will always end with **1**.
- Time limit: **100 ms**. Allowed memory: **16 MB**.

Examples

Input	Output

`1 0 1 0 1`	`1|01|01`
	`1|010|1`
	`10|1|01`
	`10|10|1`

Input	Output
`0 0 1`	`001`