# Problem I. Ultimate Army

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|---|---|
| **Time limit** | 1000 ms |
| **Mem limit** | 262144 kB |
| **OS** | Windows |

3 days, that's how much time the king gave Daffy to find him the ultimate army organization plan before he cuts his head off.

2 days already passed with no progress, but luckily Bugs came to the rescue, he gave Daffy the "ultimate"{} plan as a string, unfortunately Daffy couldn't understand this string, now only 4 hours remain.

A soldier can be described in Bugs's string as this: first the $id$ of the soldier is written then following it $x$ brackets () each for a subordinate of this soldier, each subordinate is described inside their bracket in the same way, for example the following string "2(3(4))(1)"{} means that soldier 2 is the supervisor of soldiers 3 and 1, and soldier 3 is the supervisor of soldier 4, while soldiers 1 and 4 doesn't supervise any soldiers. The string Bugs gave you describes the king(he has no supervisor) and his subordinates and their subordinates and so on.

Or more formally:

$$Soldier = Id + Subordinates$$

$$Subordinates = (Soldier) + Subordinates|\phi$$

where $\phi$ is the empty string.

Can you figure out the supervisor of each soldier and save Daffy's head?

**Input**

In the first line you're given an integer $n(1 \leq n \leq 1.4 \times 10^5)$, the number of soldiers(including the king) in the army.

In the second line you're given Bugs's string as described above, the string's length is less than or equal to $10^6$.

It's guaranteed that each $id$ from 1 to $n$ appears exactly once in the string.

**Output**

Output in a single line $n$ space separated integers, the $i$th of these integers is the supervisor of the $i$th soldier or 0 if this soldier has no supervisor(he's the king, notice that there will be only one

such soldier).

**Sample 1**

| Input | Output |
|---|---|
| 4<br>2(3(4))(1) | 2 0 2 3 |

**Sample 2**

| Input | Output |
|---|---|
| 7<br>4(2)(5(3(6)(1))(7)) | 3 4 5 0 4 3 5 |