HDNL Toy

Steve found a new toy to play with. It's called HDNL (High Definition Native Language). He doesn't know what it is used for, he just finds it interesting. HDNL works by _defining homeomorphic endofunctors mapping submanifolds of a Hilbert space_. Sadly, when Steve is looking at HDNL, he isn't always able to imagine how all it would look in the end. Each line of HDNL is consisted of **a letter and a number** and opens a tag (like HTML tag). The letter is important, though Steve can't remember why. The number defines the **level of nesting**. Steve wants to see how he can nest all the tags such that the **level of nesting** of inner tags is **bigger** than that of outer tags. Your task is to write a program for Steve which shows nicely indented and closed HDNL tags.

Input

- On the first line of input, a number **N** is read - the number of HDNL lines to follow
- Each of the next **N** lines will be a Latin letter glued to positive number

Output

- There should be `N * 2` lines
- Each output line should contain either an opening or a closing tag
- Use `1` space for indentation

Constraints

- `1 <= N <= 100 000`
- `1 <= level of nesting <= 1000`

Sample tests

Input

```
4
h1
r5
d2
a0
```

Output

```
<h1>
 <r5>
 </r5>
 <d2>
 </d2>
</h1>
<a0>
</a0>
```

Input

```
9
a1
b2
c3
d3
e2
f3
g2
h1
i2
```

Output

```
<a1>
 <b2>
  <c3>
  </c3>
  <d3>
  </d3>
 </b2>
 <e2>
  <f3>
  </f3>
 </e2>
 <g2>
 </g2>
</a1>
<h1>
 <i2>
 </i2>
</h1>
```