1851 - Bridge Coverage Systems

Description

Building bridges over the large rivers around the world is one the engineering wonders in the modern era. John is a big fan of such structures and he is trying to come out with his own revolutionary design. He will be provided with the heights of the **N (1 <= N <= 10^5)** towers lying in a straight line along the bridge. In the idea he has in mind, it's required to be able to draw a segment paralell to bridge surface among the tops of every tower (a really crazy design, isn't it?), but with the initial heights this requirement might not be accomplished. A special extendable device will be placed on the top of each tower to make it as high as required, but as higher the device needs to be able to go as more expensive becomes, so he asked you for help in computing for each tower what's the minimum integer high required for its device.

Input specification

An integer **N** denoting how many towers there are in the bridge. **N** lines follow each one with a positive integer saying the height of one of the towers. Towers order along the bridge is the one given in the input. No height will be more than **10^6**.

Output specification

N lines having the required integer for each tower. The i-th line must match the requirement for the i-th tower in the input.

Sample input

```
10
34
61
73
89
61
91
87
18
72
28
```

Sample output

```
57
30
18
2
30
0
4
73
19
63
```

Hint(s)

Source	Ray Williams Robinson Valiente
Added by	**ymondelo20**
Addition date	2012-05-30
Time limit (ms)	25000
Test limit (ms)	2500
Memory limit (kb)	130000
Output limit (mb)	64
Size limit (bytes)	30000
Enabled languages	C C# C++ Java Pascal Perl PHP Python Ruby Text