Picture Perfect

Description

Mr. Spivey has a stack of student yearbook photos.

He wants to lay the pictures on a flat surface edge-to-edge to form a filled rectangle *with minimum perimeter.*

All photos must be fully visible. Each picture is a square with dimensions 1 unit by 1 unit.

For example, Mr. Spivey could place the 12 photos in a 4 by 3 grid:

Of course, he could also place the 12 photos in a 3 by 4 grid:

Both arrangements would have the same minimum perimeter of 14 units.

Input Specification

The first line of input will be an integer n $(0 < n \leq 10)$. This will indicate how many photo arrangements the user will ask your program to consider.

Your program will then prompt the user n times for P, the number of pictures in each photo arrangement. You may assume that $P < 65000$ and that the user will always provide valid input at this prompt.

Output Specification

Your program will indicate the minimum perimeter and the dimensions for each photo arrangement.

Sample Input/Output Session #1 (output in **`bold`** text, input in `regular` text)

```
How many photo arrangements will be considered?
1
How many pictures in photo arrangement #1?
100
Minimum perimeter is 40 with dimensions 10 by 10.
```

Sample Input/Output Session #2 (output in **bold** text, input in regular text)

How many photo arrangements will be considered?
apples
How many photo arrangements will be considered?
-1
How many photo arrangements will be considered?
2.3
How many photo arrangements will be considered?

How many photo arrangements will be considered?
4
How many pictures in photo arrangement #1?
15
Minimum perimeter is 16 with dimensions 3 by 5.
How many pictures in photo arrangement #2?
195
Minimum perimeter is 56 with dimensions 13 by 15.
How many pictures in photo arrangement #3?
4
Minimum perimeter is 8 with dimensions 2 by 2.
How many pictures in photo arrangement #4?
7
Minimum perimeter is 16 with dimensions 1 by 7.