

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 ($0 \leq n \leq 10$). 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.