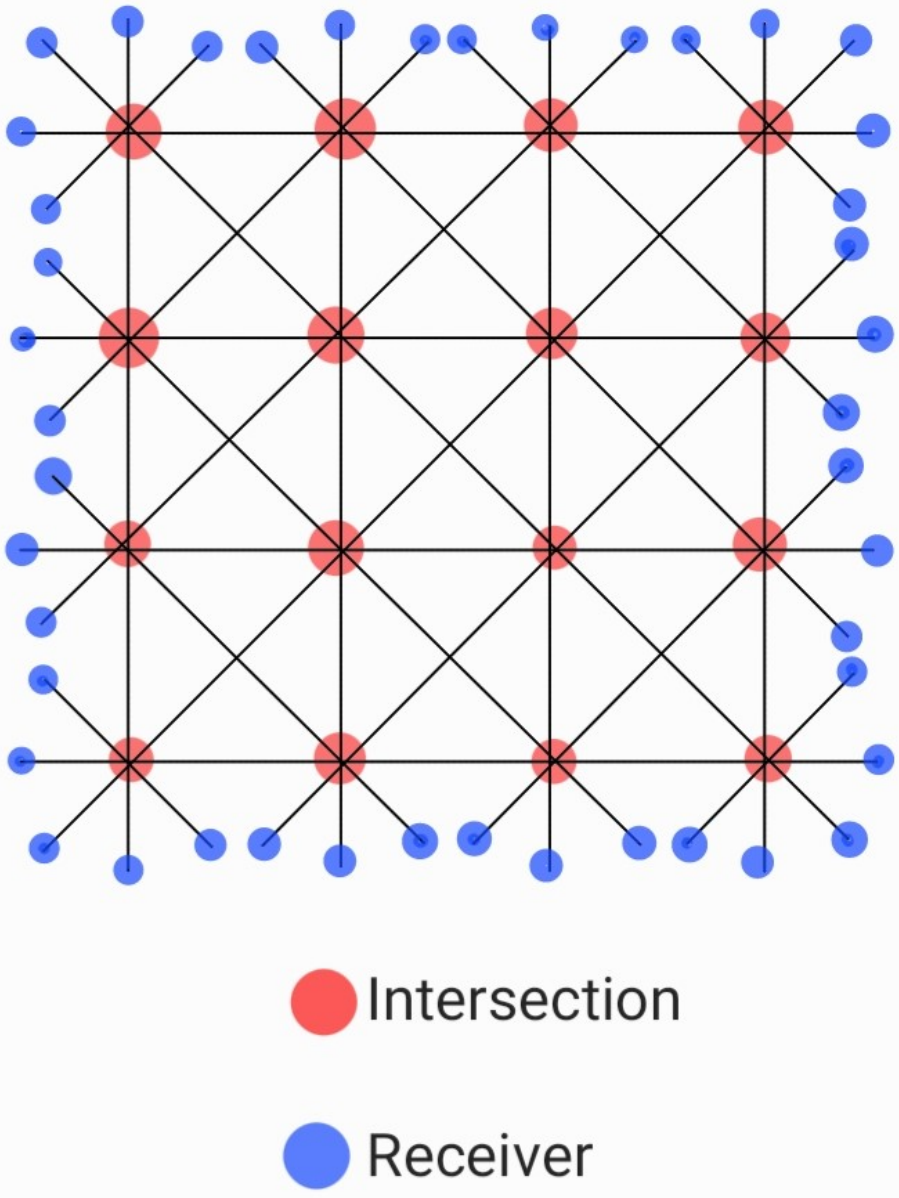
Protocols

HackerRank

An old data communication system uses a grid of fixed, straight-lined rails on the same plane, for sending data to receivers located at the ends of the rails.

The rails expand in all 8 directions (N, NE, E, ES, S, etc.) and there are multiple parallel rails for each direction. The points where the rails cross each other are called intersections. This grid is used to carry data from sensors hooked to the intersections.



There are no routing protocols involved, therefore it is designed so that when a data packet arrives at an intersection it moves along the same direction it was heading towards.

The system abides by the following rules:

- One or more sensors can be connected to the same intersection, but a sensor is connected to only one intersection
- This method of communication allows only one device to communicate a particular protocol on the same line.
- If two or more devices use the same protocol on the same straight line a collision occurs.
- A sensor should be able to communicate in all directions at all times without collisions.
- A sensor can only use one protocol.
- The topology of devices belonging to a protocol should be unique. If all the devices of protocol **x** are placed on exactly the same intersections as protocol **y**, then **x** and **y** are not unique.

As the engineer in charge of this system, your task is to determine the number of distinct protocols you need to utilise the grid to the fullest and include as many sensors as possible, without collisions.

To make things easier, let's assume the intersections in the grid from a square shape and that there should be exactly square root of **n** sensors for each protocol.

Input Format

Single line containing the number of intersections

Constraints

- $0 < n < 150$
- n is a perfect square number

Output Format

Print the number of protocols

Sample Input 0

```
4
```

Sample Output 0

```
0
```

Sample Input 1

```
16
```

Sample Output 1

```
2
```