# Problem 1954: Minimum Garden Perimeter to Collect Enough Apples

## Problem Information

**Difficulty:** Medium
**Acceptance Rate:** 55.19%
**Paid Only:** No
**Tags:** Math, Binary Search

## Problem Description

In a garden represented as an infinite 2D grid, there is an apple tree planted at **every** integer coordinate. The apple tree planted at an integer coordinate `(i, j)` has `|i| + |j|` apples growing on it.

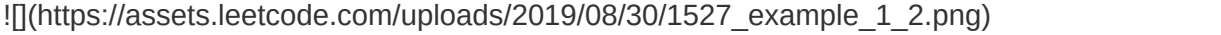
You will buy an axis-aligned **square plot** of land that is centered at `(0, 0)`.

Given an integer `neededApples`, return _the**minimum perimeter** of a plot such that **at least**_****`neededApples` _apples are**inside or on** the perimeter of that plot_.

The value of `|x|` is defined as:

* `x` if `x >= 0` * `-x` if `x < 0`

**Example 1:**




**Input:** neededApples = 1 **Output:** 8 **Explanation:** A square plot of side length 1 does not contain any apples. However, a square plot of side length 2 has 12 apples inside (as depicted in the image above). The perimeter is 2 * 4 = 8.

**Example 2:**

**Input:** neededApples = 13 **Output:** 16

**Example 3:**

**Input:** neededApples = 1000000000 **Output:** 5040

**Constraints:**

* `1 <= neededApples <= 1015`

## Code Snippets

**C++:**

```
class Solution {
public:
long long minimumPerimeter(long long neededApples) {

}
};
```

**Java:**

```
class Solution {
public long minimumPerimeter(long neededApples) {

}
}
```

**Python3:**

```
class Solution:
def minimumPerimeter(self, neededApples: int) -> int:
```