Project Euler #165: Intersections

This problem is a programming version of Problem 165 from projecteuler.net

A segment is uniquely defined by its two endpoints.
By considering two line segments in plane geometry there are three possibilities:
the segments have zero points, one point, or infinitely many points in common.

Moreover when two segments have exactly one point in common it might be the case that that common point is an endpoint of either one of the segments or of both. If a common point of two segments is not an endpoint of either of the segments it is an interior point of both segments.

We will call a common point T of two segments L_1 and L_2 a true intersection point of L_1 and L_2 if T is the only common point of L_1 and L_2 and T is an interior point of both segments.

Consider the three segments $L_1, L_2, \text{and } L_3$:

$L_1 : (27, 44)$ to $(12, 32)$
$L_2 : (46, 53)$ to $(17, 62)$
$L_3 : (46, 70)$ to $(22, 40)$

It can be verified that line segments L_2 and L_3 have a true intersection point. We note that as the one of the end points of $L_3 : (22, 40)$ lies on L_1 this is not considered to be a true point of intersection. L_1 and L_2 have no common point. So among the three line segments, we find one true intersection point.

Now let us do the same for n line segments. To this end, we generate $4n$ numbers using the so-called "Blum Blum Shub" pseudo-random number generator.

$$s_0 = 290797$$
$$s_{n+1} = s_n \times s_n \bmod 50515093$$
$$t_n = s_n \bmod 500$$

To create each line segment, we use four consecutive numbers t_n. That is, the first line segment is given by:

(t_1, t_2) to (t_3, t_4)

The first four numbers computed according to the above generator should be: $27, 144, 12 \text{ and } 232$. The first segment would thus be $(27, 144) \text{to} (12, 232)$.

How many distinct true intersection points are found among the n line segments?

Input Format

One integer is given on first line representing n.

Constraints

- $10 \leqslant n \leqslant 1000$

Output Format

Print one integer which is the answer to the problem.

Sample Input 0

```
10
```

Sample Output 0

```
5
```