



# Spies, Revised



Problem

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Leaderboard

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Two spies in a grid will have their covers blown if:

1. They are both in the same row.
2. They are both in the same column.
3. They can see each other diagonally (i.e., lie in a line inclined  $45^\circ$  or  $135^\circ$  to the base of the grid).

The level of danger is now increased! In addition to the conditions above, *no 3 spies may lie in any straight line*. This line need not be aligned  $45^\circ$  or  $135^\circ$  to the base of grid.

Write a program in the language of your choice to place  $N$  spies (one spy per row) on an  $N \times N$  grid without blowing anyone's cover. Your program must then print the following 2 lines describing a valid configuration:

1. The value of  $N$ .
2. A space-separated list of 1-indexed column numbers, where each value  $i$  is the column number of the spy in row  $i$  (where  $1 \leq i \leq N$ ).

Solve this problem for  $N$  as large as possible, up to (and including) 1000.

**Note:** *Run* and *Custom Input* are not available for this challenge; you must click *Submit Code* for your submission to be scored. Your score for this challenge will always be the maximum value scored by any of your submissions.

## Examples

In the examples below,  $S$  denotes a spy and  $*$  denotes an empty cell.

### Sample Configuration 0

A valid configuration for  $N = 11$ :

```
* S * * * * *
* * * S * * * *
* * * * * S * *
S * * * * *
* * * * * S * *
* * * * * * S
* * * S * * * *
* * S * * * * *
* * * * * S *
* * * * * S * *
* * * * S * * *
* * * * * S *
```

### Sample Output 0

This C++ code:

```
#include <stdio>
using namespace std;

int main(){
    cout << "11\n" ;
```

```
cout << "2 4 7 1 8 11 5 3 9 6 10" ;
return 0 ;
}
```

Produces this output:

```
11
2 4 7 1 8 11 5 3 9 6 10
```

This configuration will earn a score of  $11/10 = 1.1$ .

### Sample Configuration 1

A valid configuration for  $N = 13$ :

```
S * * * * *
* * S * * * *
* * * * * S *
* * * * * S *
* * * * S * *
* S * * * *
* * * * * S *
* * * S * * *
* * * * S *
* * * * * S
* * * * S *
* * S * * *
* * * S * * *
```

### Sample Output 1

This Python code:

```
print "13"
print "1 3 12 10 7 2 11 5 8 13 9 4 6"
```

Produces this output:

```
13
1 3 12 10 7 2 11 5 8 13 9 4 6
```

This configuration will earn a score of  $13/10 = 1.3$ .

### Sample Configuration 2

An invalid configuration for  $N = 7$ :

```
S * * * *
* * S * *
* * * S *
* * * * S
* S * * *
* * S * *
* * * S *
```

### Sample Output 2

The following output:

```
7
1 3 5 7 2 4 6
```

Will earn a score of **0** because the spies in the first **3** rows are in a straight line.

### Input Format

There is no input for this challenge.

### Constraints

- $N$  is odd.
- $N \leq 1000$  (Do not submit for any value of  $N$  larger than 1000)

### Scoring

A correct configuration will get a score of  $\frac{N}{10}$ .

### Output Format

Print the following 2 lines of output:

1. The first line should be a single integer denoting the value of  $N$ .
2. The second line should contain a space-separated list of integers. Each integer  $i$  (where  $0 \leq i < N$ ) should be the 1-indexed column number where the spy in row  $i$  is located.

[f](#) [t](#) [in](#)

Solved score: 99.90pts

Submissions: 2020

Max Score: 100


Difficulty: Expert

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C++  

```
1 #include <cmath>
2 #include <cstdio>
3 #include <vector>
4 #include <iostream>
5 #include <algorithm>
6 using namespace std;
7
8
9 int main() {
10     /* Enter your code here. Read input from STDIN. Print output to STDOUT */
11     return 0;
12 }
13
```

Line: 1 Col: 1

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