Problem 2151: Maximum Good People Based on Statements

Problem Information

Difficulty: Hard
Acceptance Rate: 0.00%
Paid Only: No

Problem Description

There are two types of persons:

The

good person

: The person who always tells the truth.

The

bad person

: The person who might tell the truth and might lie.

You are given a

0-indexed

2D integer array

statements

of size

n x n

that represents the statements made by

n

people about each other. More specifically,

statements[i][j]

could be one of the following:

0

which represents a statement made by person

i

that person

j

is a

bad

person.

1

which represents a statement made by person

i

that person

j

is a

good

person.

2

represents that

no statement

is made by person

i

about person

j

.

Additionally, no person ever makes a statement about themselves. Formally, we have that

statements[i][i] = 2

for all

0 <= i < n

.

Return

the

maximum

number of people who can be

good

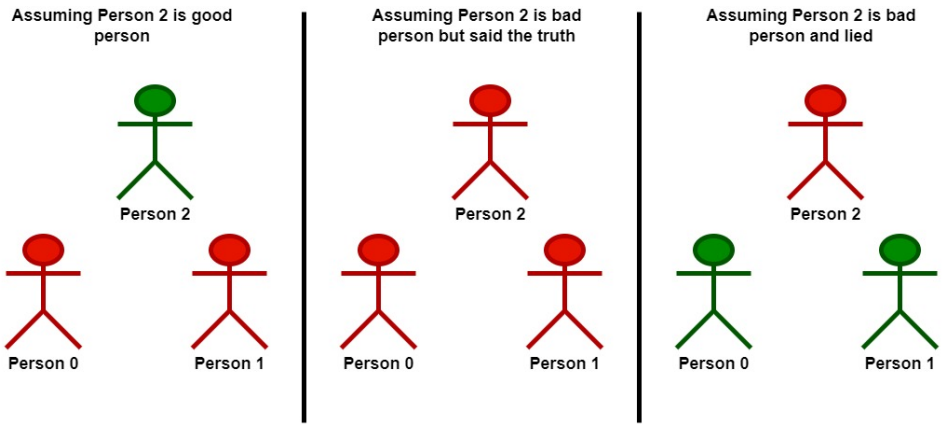
based on the statements made by the

n

people

.

Example 1:



Input:

statements = [[2,1,2],[1,2,2],[2,0,2]]

Output:

2

Explanation:

Each person makes a single statement. - Person 0 states that person 1 is good. - Person 1 states that person 0 is good. - Person 2 states that person 1 is bad. Let's take person 2 as the key. - Assuming that person 2 is a good person: - Based on the statement made by person 2, person 1 is a bad person. - Now we know for sure that person 1 is bad and person 2 is good. - Based on the statement made by person 1, and since person 1 is bad, they could be: - telling the truth. There will be a contradiction in this case and this assumption is invalid. - lying. In this case, person 0 is also a bad person and lied in their statement. -

Following that person 2 is a good person, there will be only one good person in the group

. - Assuming that person 2 is a bad person: - Based on the statement made by person 2, and since person 2 is bad, they could be: - telling the truth. Following this scenario, person 0 and 1 are both bad as explained before. -

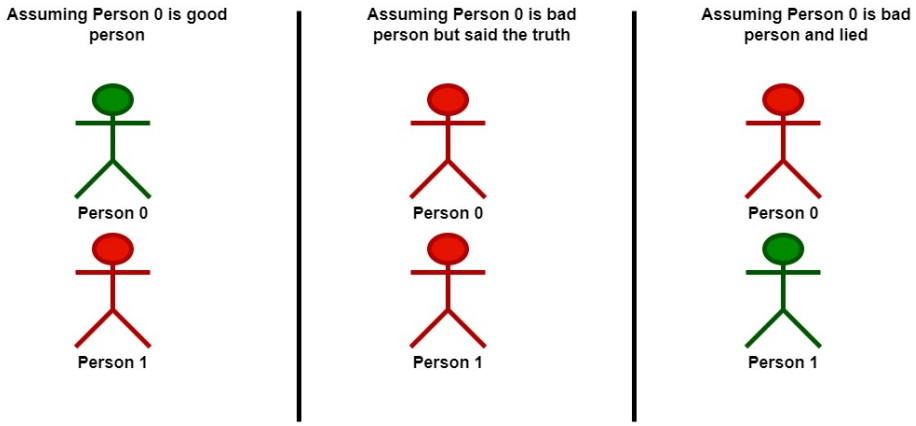
Following that person 2 is bad but told the truth, there will be no good persons in the group

. - lying. In this case person 1 is a good person. - Since person 1 is a good person, person 0 is also a good person. -

Following that person 2 is bad and lied, there will be two good persons in the group

. We can see that at most 2 persons are good in the best case, so we return 2. Note that there is more than one way to arrive at this conclusion.

Example 2:



Input:

statements = [[2,0],[0,2]]

Output:

1

Explanation:

Each person makes a single statement. - Person 0 states that person 1 is bad. - Person 1 states that person 0 is bad. Let's take person 0 as the key. - Assuming that person 0 is a good person: - Based on the statement made by person 0, person 1 is a bad person and was lying.

-

Following that person 0 is a good person, there will be only one good person in the group

. - Assuming that person 0 is a bad person: - Based on the statement made by person 0, and since person 0 is bad, they could be: - telling the truth. Following this scenario, person 0 and 1 are both bad. -

Following that person 0 is bad but told the truth, there will be no good persons in the group

. - lying. In this case person 1 is a good person. -

Following that person 0 is bad and lied, there will be only one good person in the group

. We can see that at most, one person is good in the best case, so we return 1. Note that there is more than one way to arrive at this conclusion.

Constraints:

n == statements.length == statements[i].length

2 <= n <= 15

statements[i][j]

is either

0

,

1

, or

2

.

statements[i][i] == 2

Code Snippets

C++:

```
class Solution {
public:
int maximumGood(vector<vector<int>>& statements) {

}
};
```

Java:

```
class Solution {
public int maximumGood(int[][] statements) {

}
}
```

Python3:

```
class Solution:
def maximumGood(self, statements: List[List[int]]) -> int:
```

Python:

```
class Solution(object):
def maximumGood(self, statements):
"""
:type statements: List[List[int]]
:rtype: int
"""
```

JavaScript:

```
/**
* @param {number[][]} statements
* @return {number}
*/
```

```
var maximumGood = function(statements) {

};
```

TypeScript:

```
function maximumGood(statements: number[][]): number {

};
```

C#:

```
public class Solution {
public int MaximumGood(int[][] statements) {

}
}
```

C:

```
int maximumGood(int** statements, int statementsSize, int* statementsColSize)
{

}
```

Go:

```
func maximumGood(statements [][]int) int {

}
```

Kotlin:

```
class Solution {
fun maximumGood(statements: Array<IntArray>): Int {

}
}
```

Swift:

```
class Solution {
func maximumGood(_ statements: [[Int]]) -> Int {

}
}
```

Rust:

```
impl Solution {
pub fn maximum_good(statements: Vec<Vec<i32>>) -> i32 {

}
}
```

Ruby:

```
# @param {Integer[][]} statements
# @return {Integer}
def maximum_good(statements)

end
```

PHP:

```
class Solution {

/**
* @param Integer[][] $statements
* @return Integer
*/
function maximumGood($statements) {

}
}
```

Dart:

```
class Solution {
int maximumGood(List<List<int>> statements) {

}
}
```

Scala:

```
object Solution {
def maximumGood(statements: Array[Array[Int]]): Int = {

}
}
```

Elixir:

```
defmodule Solution do
@spec maximum_good(statements :: [[integer]]) :: integer
def maximum_good(statements) do

end
end
```

Erlang:

```
-spec maximum_good(Statements :: [[integer()]]) -> integer().
maximum_good(Statements) ->
.
```

Racket:

```
(define/contract (maximum-good statements)
(-> (listof (listof exact-integer?)) exact-integer?)
)
```

Solutions

C++ Solution:

```
/*
* Problem: Maximum Good People Based on Statements
* Difficulty: Hard
* Tags: array
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/
```

```
class Solution {
public:
int maximumGood(vector<vector<int>>& statements) {

}
};
```

Java Solution:

```
/**
* Problem: Maximum Good People Based on Statements
* Difficulty: Hard
* Tags: array
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/

class Solution {
public int maximumGood(int[][] statements) {

}
}
```

Python3 Solution:

```
"""
Problem: Maximum Good People Based on Statements
Difficulty: Hard
Tags: array

Approach: Use two pointers or sliding window technique
Time Complexity: O(n) or O(n log n)
Space Complexity: O(1) to O(n) depending on approach
"""

class Solution:
def maximumGood(self, statements: List[List[int]]) -> int:
# TODO: Implement optimized solution
```

```
pass
```

Python Solution:

```
class Solution(object):
def maximumGood(self, statements):
"""
:type statements: List[List[int]]
:rtype: int
"""
```

JavaScript Solution:

```
/**
* Problem: Maximum Good People Based on Statements
* Difficulty: Hard
* Tags: array
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/

/**
* @param {number[][]} statements
* @return {number}
*/
var maximumGood = function(statements) {

};
```

TypeScript Solution:

```
/**
* Problem: Maximum Good People Based on Statements
* Difficulty: Hard
* Tags: array
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
```

```
*/

function maximumGood(statements: number[][]): number {

};
```

C# Solution:

```
/*
* Problem: Maximum Good People Based on Statements
* Difficulty: Hard
* Tags: array
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
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*/

public class Solution {
public int MaximumGood(int[][] statements) {

}
}
```

C Solution:

```
/*
* Problem: Maximum Good People Based on Statements
* Difficulty: Hard
* Tags: array
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/

int maximumGood(int** statements, int statementsSize, int* statementsColSize)
{

}
```

Go Solution:

```
// Problem: Maximum Good People Based on Statements
// Difficulty: Hard
// Tags: array
//
// Approach: Use two pointers or sliding window technique
// Time Complexity: O(n) or O(n log n)
// Space Complexity: O(1) to O(n) depending on approach

func maximumGood(statements [][]int) int {

}
```

Kotlin Solution:

```
class Solution {
fun maximumGood(statements: Array<IntArray>): Int {

}
}
```

Swift Solution:

```
class Solution {
func maximumGood(_ statements: [[Int]]) -> Int {

}
}
```

Rust Solution:

```
// Problem: Maximum Good People Based on Statements
// Difficulty: Hard
// Tags: array
//
// Approach: Use two pointers or sliding window technique
// Time Complexity: O(n) or O(n log n)
// Space Complexity: O(1) to O(n) depending on approach

impl Solution {
pub fn maximum_good(statements: Vec<Vec<i32>>) -> i32 {
```

```
}
}
```

Ruby Solution:

```
# @param {Integer[][]} statements
# @return {Integer}
def maximum_good(statements)

end
```

PHP Solution:

```
class Solution {

/**
* @param Integer[][] $statements
* @return Integer
*/
function maximumGood($statements) {

}
}
```

Dart Solution:

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int maximumGood(List<List<int>> statements) {

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object Solution {
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defmodule Solution do
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(define/contract (maximum-good statements)
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)
```